“Doctor” is derived from the Latin word “Docere” means “To Teach”.
## Theme: ARTHRITIS

### Past Editors
- Prof. Mahendra Ch. Mishra
- Prof. Niranjan Tripathy
- Prof. Krupasindhu Panda
- Prof. Niranjan Rout
- Dr. Rekha Das

### Past State President
- Dr. Rabindranath Panda

### Hon. State Secretary
- Dr. Kamala Kanta Panigrahy

### Hon. State Finance Secretary
- Dr. Janmejaya Mohapatra

### Secretary, OMJ
- Dr. Prasanna Kumar Rathor

### Office Bearers of IMA

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imm. Past State President</td>
<td>Dr. Bijaya Ku. Misra, BBSR</td>
</tr>
<tr>
<td>Vice Presidents</td>
<td>Dr. Mrutyunjay Mohapatra, Cuttack</td>
</tr>
<tr>
<td></td>
<td>Dr. Bijaya Ku. Dutta, Sambalpur</td>
</tr>
<tr>
<td></td>
<td>Dr. S.S. Khandelwal, Baripada</td>
</tr>
<tr>
<td></td>
<td>Dr. Gayatri Kar, Berhampur</td>
</tr>
<tr>
<td>Hon. Joint Secretaries</td>
<td>Dr. Trupti Ranjan Sarangi, Cuttack</td>
</tr>
<tr>
<td></td>
<td>Dr. Satyadarshi Patnaik, Berhampur</td>
</tr>
<tr>
<td></td>
<td>Dr. Braja Kishore Dash, Cuttack</td>
</tr>
<tr>
<td></td>
<td>Dr. Braja Kishore Panda, BBSR</td>
</tr>
<tr>
<td>Secretary, IMA AMS</td>
<td>Dr. (Mrs.) Nibedita Panda, BBSR</td>
</tr>
<tr>
<td></td>
<td>Dr. Saroj Kumar Mishra, Berhampur</td>
</tr>
<tr>
<td>Secretary, IMA CGP</td>
<td>Dr. Prasanta Ku. Patro, Berhampur</td>
</tr>
<tr>
<td>Director of Studies</td>
<td>Dr. Mamata Choudhury, Berhampur</td>
</tr>
<tr>
<td></td>
<td>Dr. Biswanath Patnaik, BBSR</td>
</tr>
<tr>
<td>Secretary, Social Welfare</td>
<td>Dr. Sandhyarani Panigrahi, Berhampur</td>
</tr>
<tr>
<td></td>
<td>Dr. CWC Members</td>
</tr>
<tr>
<td></td>
<td>Dr. Jagannath Mohapatra, BBSR</td>
</tr>
<tr>
<td></td>
<td>Dr. Saroj Kumar Sahu, BBSR</td>
</tr>
<tr>
<td></td>
<td>Dr. Abhoyu Ku. Kar, Berhampur</td>
</tr>
<tr>
<td>Nominated Members</td>
<td>Dr. Rabri Narayan Dash, Rourkela</td>
</tr>
<tr>
<td></td>
<td>Dr. Pravat Ku. Panda, Angul</td>
</tr>
</tbody>
</table>

### Advisory Board

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Justice Indrajeet Mohanty, Cuttack</td>
</tr>
<tr>
<td>Dr. Prasanta Ku. Das, Cuttack</td>
</tr>
<tr>
<td>Prof. Sidhartha Das, Cuttack</td>
</tr>
<tr>
<td>Prof. Bidyut K. Das, Cuttack</td>
</tr>
<tr>
<td>Dr. Sidharth N. Shah, Mumbai</td>
</tr>
<tr>
<td>Dr. M. Abbas, Cuttack</td>
</tr>
<tr>
<td>Prof. Sasank R. Joshi, Mumbai</td>
</tr>
<tr>
<td>Prof. Rohini Panda, New Delhi</td>
</tr>
<tr>
<td>Dr. Kabi Pr. Mishra, BBSR</td>
</tr>
<tr>
<td>Prof. Sukumar Mukherjee, Kolkata</td>
</tr>
<tr>
<td>Prof. Pramod Mallick, Cuttack</td>
</tr>
<tr>
<td>Prof. V. Mohan, Chennai</td>
</tr>
<tr>
<td>Prof. Ramnath Mishra, Lucknow</td>
</tr>
<tr>
<td>Prof. Gopal Ch. Kar, Cuttack</td>
</tr>
<tr>
<td>Prof. Sanatan Rath, Cuttack</td>
</tr>
<tr>
<td>Dr. B.B. Reewari, New Delhi</td>
</tr>
<tr>
<td>Dr. J.P. Das, Cuttack</td>
</tr>
<tr>
<td>Prof. Jitendra Singh, J &amp; K</td>
</tr>
<tr>
<td>Prof. P.C. Sahoo, Berhampur</td>
</tr>
<tr>
<td>Dr. Banshi Saboo, Ahmedabad</td>
</tr>
<tr>
<td>Prof. Ashok Das, Puducherry</td>
</tr>
<tr>
<td>Prof. Sarita Bajaj, Allahabad</td>
</tr>
<tr>
<td>Dr. N.R. Subudhi, Berhampur</td>
</tr>
<tr>
<td>Dr. Dipak Mitra, Cuttack</td>
</tr>
<tr>
<td>Prof. S.N. Panda, Cuttack</td>
</tr>
<tr>
<td>Prof. Annapurna Panda, Cuttack</td>
</tr>
<tr>
<td>Prof. Sonamali Bag, Bhubaneswar</td>
</tr>
<tr>
<td>Prof. Prakash C. Mahapatra, Ctc</td>
</tr>
<tr>
<td>Prof. A.K. Baliarsinha, Cuttack</td>
</tr>
<tr>
<td>Prof. Sarojini Sarangi, Cuttack</td>
</tr>
<tr>
<td>Prof. R.N. Biswal, Cuttack</td>
</tr>
<tr>
<td>Prof. N.C. Padhy, Berhampur</td>
</tr>
</tbody>
</table>

### Editorial Board

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. Purma Ch. Mohapatra, Ctc</td>
</tr>
<tr>
<td>Prof. C.B.K. Mohanty, Cuttack</td>
</tr>
<tr>
<td>Prof. Jayanta Dash, Cuttack</td>
</tr>
<tr>
<td>Prof. Niranjan Mohanty, Cuttack</td>
</tr>
<tr>
<td>Prof. Shyama Kanungo, Cuttack</td>
</tr>
<tr>
<td>Prof. S.P. Singh, Cuttack</td>
</tr>
<tr>
<td>Dr. Maya Gantayet, Cuttack</td>
</tr>
<tr>
<td>Dr. Sreejoy Patnaik, Cuttack</td>
</tr>
<tr>
<td>Prof. Pratav Kumar Padhy, Cuttack</td>
</tr>
<tr>
<td>Prof. Biswa N. Mohanty, Cuttack</td>
</tr>
<tr>
<td>Prof. Indu Bhusan Kar, Cuttack</td>
</tr>
<tr>
<td>Prof. Kashinath Padhiyari, Burla</td>
</tr>
<tr>
<td>Dr. Jayanta Rath, Cuttack</td>
</tr>
<tr>
<td>Prof. Sarat Ku. Mohapatra, Ctc</td>
</tr>
<tr>
<td>Dr. Ananga M. Dweibedy, Cuttack</td>
</tr>
<tr>
<td>Prof. D.C. Pattanaik, Cuttack</td>
</tr>
<tr>
<td>Prof. L.K. Meher, Berhampur</td>
</tr>
<tr>
<td>Prof. Datteswar Hota, Cuttack</td>
</tr>
<tr>
<td>Prof. B.B. Misra, Cuttack</td>
</tr>
<tr>
<td>Prof. Nilamadhab Rath, Cuttack</td>
</tr>
<tr>
<td>Prof. S.N. Panda, Cuttack</td>
</tr>
<tr>
<td>Prof. Rabi Satpay, Berhampur</td>
</tr>
<tr>
<td>Prof. Umesh Ch. Patra, Cuttack</td>
</tr>
<tr>
<td>Dr. N.R. Subudhi, Berhampur</td>
</tr>
<tr>
<td>Dr. Dipak Mitra, Cuttack</td>
</tr>
<tr>
<td>Prof. S.N. Routray, Berhampur</td>
</tr>
<tr>
<td>Prof. D.N. Maharana, Cuttack</td>
</tr>
<tr>
<td>Dr. Ashok Mallick, Cuttack</td>
</tr>
<tr>
<td>Prof. R.N. Sahoo, Cuttack</td>
</tr>
<tr>
<td>Prof. Kailash Ch. Mahapatra, Ctc</td>
</tr>
<tr>
<td>Dr. Sisir Ku. Mahapatra, BBSR</td>
</tr>
<tr>
<td>Prof. Ramesh Samantar, Ctc</td>
</tr>
</tbody>
</table>

### Editorial Correspondence

**Dr. Jayanta K. Panda,** Editor, Asso. Professor, Medicine, SCB Medical College  
Mob: 9437028282, Email: djayanttpanda@gmail.com, IMA House, Medical Road, Ranihat, Cuttack - 7, Odisha  
Ph: 0671-2413060, Email: imaoirissa@gmail.com, Website: www.imaodisha.com
### Editorial
**ARTHRITIS: “A Challenge for the Modern Medicine”**
Jayanta K. Panda

### Secretary’s Commentary
**Arthritis, Everybody’s Disease**
Prasanna Ku Rathor

### Invited Theme Article
1. Approach to a patient with Arthritis
   - B.K Das, R. Tripathy

### Theme Article
6. Low Back Pain: Therapeutic Approach by Pain Physicians
12. Psoriatic Arthritis
   - S. Patnaik
16. Serum Biochemical and Immunological Markers in Rheumatoid Arthritis
   - N. Devi, R. Padhy, R. Rattan, M.K Mandal, S. Mahapatra
20. Anaesthetic Implications of Ankylosing Spondylitis - An Overview
   - S. Nanda
24. Anesthesia in a Patient of Rheumatoid Arthritis
   - S.S. Routray, B.K. Pradhan, R.K. Sarangi
28. HIV-Associated Rheumatic Diseases
   - S. Swain

### Research Article
32. Magnetic Resonance Imaging in Characterization of Congenital and Developmental Disorders of Spine
   - R. Acharya, J. Mohanty, S. Parida, B.M. Swain, K. Parida, Elengo S
36. A Comparative Study Between Saline Infusion Sonography Vs Conventional Ultrasound in The Evaluation of Endometrial Pathology
   - B. Mishra, M. Sahu
40. Association of alcohol and tobacco with gastric carcinoma in West Bengal
45. MRI Evaluation of Posterior Fossa Tumors with Histopathological Correlation
   - Inidira D., J. Mohanty, S. Parida, B.M. Swain, K. Parida, Elengo S
50. Scoring System for Prediction of Outcome in Severe Falciparum Malaria
   - R.K. Mohanty, S. Shetty, D. Tripathy, L.K. Meher
62. Intravenous Labetalol Versus Oral Nifedipine In Acute Hypertensive Emergencies of Pregnancy
   - N. Panda, K. Mohapatra
MR Evaluation of Spinal Cord Tumors with Histopathological Correlation
S. Choudary, J. Mohanty, S. Parida, B. Manjari Swain, K. Parida, B. Durai

Study of the post sterilisation ectopic pregnancies at S.C.B. MCH, Cuttack
T.S. Rath, A.K. Nayak, L. Das

An Observational Study of Septic Abortion in SCB Medical College
S.C. Behera, R. Ghadei

Coagulation Profile in Diabetes Mellitus and its Association with Microvascular Complications

A comparative study between Manual vacuum aspiration and electrical vacuum aspiration for first trimester MTP
S.K. Samal, M. Padhi, S. Rathod, S. Jajodia

Study of Vitamin D Level in Type 2 Diabetes Mellitus
S. N. Nayak, P. K. Hui, L.K. Meher, C. Bisoyi, A. Mundu, A. Agrawal

An innovative approach to complete postoperative analgesia for paediatric patients through caudal Jelco cannula technique – A pilot study
S. Mishra, C. Patra

Dynamic Lung Functions in Pregnancy Complicated with Anemia

Evaluation of Serum Uric Acid in Essential Hypertension

Coagulation Profile in Menorrhagia of Child Bearing Age in Women of Odisha
G. Priyadarshini, S. Moharana, R. Mohanty, A. Priyadarshini

Ormeloxifene in Treatment of DUB
S. Swain, B. Mallick

Superioly Based Nasolabial Flap is a Good Alternative for Moderate Buccal Mucosal Defect with Preserved Mandible
S.P. Mishra

Choline : A Unique Neuronal Protector and Rejuvenator
P.K. Rathor, S. Moharana, D.N. Moharana

Double Primary Malignancies : A growing challenge for long term Cancer survivors
L. Pattanayak, N. Panda

Acute Rheumatic Fever : Aetiology, Pathogenesis, Diagnosis And Management
T.K. Mishra, S.N. Routray, B. Das, C. Satpathy

Articulation Synoviales – An Anatomical Overview
M. Panda, C.L. Sarangi, R. Biswal, S.Seth

Symphysis Pubis Diastasis After Normal Vaginal Birth : A Case Report
S.K. Samal, S. Rathod, S. Jagadeb, S. Kanungo

A rare case of Conjoined Twins (Parapagus dicephalus tetra-brachius tripus)
T.S. Rath, K. Priyambada, S. Jena
156 Left Ventricular Aneurysm – Traced from a Chest X-ray

158 Retained Foreign Body in Thorax – A Rare Case Report After 32 Years
   A. Mishra, S. K. Sahu, S. K Mohanty, M. Kar

161 ‘Masked’ Congenital Adrenal Hyperplasia : A Case Report
   S. Kanungo, K. Mohapatra, S. Ghosh, S. Mohanty

164 Left Poland Syndrome With Dextrocardia with Two Superior Venacava
   G. Pradhan, T. Mohanty, G. Panda, H.K. Sethy, J. Patnaik

167 Type 2 lepra reaction - A rare cause of pyrexia of unknown origin
   P. Sahu, N. Mohanty, S.S. Acharya, S.S. Kurien, D. Mishra

170 Cervical Pregnancy : A Rare Case Report
   S.K. Nayak, M. Agarwal, K.R. Mohapatra

172 Chronic Nonpuerperal Uterine Inversion : A Rare Case Report
   P.K. Nayak, A. Mishra, O.A. Das, S. Misra

174 Bilateral Cancer Breast Treated with M.R.M. followed by Immediate Reconstruction with
   Bilateral Latismusdorsi Myocutaneous Flap
   S. Mishra, K. Goutam, D. Biswal

176 Fraser Syndrome : A Case Report
   C. Nayak, S. Swain, A.K. Nayak

178 Unusual Complication of Sickle Cell Diseases
   A.K. Sahu, B. Nayak, P.K. Padhi, J.K. Panda

179 Difficult intubation in a rare case of Pindborg tumor
   N. Moda, M. Patel, P. Verma, S. Kandi, D. Swain, P. Patel

181 Imperforate Hymen with Hematocolpus and Hematometra
   G.R. Tripathy, A.K. Nayak

182 Kikuchi-Fujimoto Disease Mimicking TB Adenitis – A Case Report
   S. Dash, S. Sahu, M.R. Baisalh

184 Diagnosis of tuberculosis during oncological practice

187 Report of an atypical case of Wilson disease

190 Tubercular Arthritis Masquereding as Bony Crisis in a Child with Sickle Cell Anemia
   P.C. Panda, N.R. Mishra, S. Panda

192 A Case of Hansen’s Disease with ENL Presenting as PUO
   S.K. Mohanty¹, J.K. Panda²

Practitioners Column

193 Arthritis in Ayurveda
   A. Das

Letter to Editor

195 Medical Education and Health Care Scenario in India
   – Current Status and Future Prospects
   G.C. Sahoo
Every modern man desires to be highly agile and immobility is not acceptable in this era of competition for performance and achievement. Joint disorders account for nearly one-fifth of all out patient visits in our country and half of them have significant functional limitation.

An Arthritis may be self limiting requiring minimal evaluation and symptomatic therapy & reassurance or may be associated with a complex pathophysiology to represent a systemic immunological disorder requiring elaborate diagnostic work up and life long intervention. There are conditions which alarm prompt “Red Flag” diagnosis and management like Septic Arthritis, Crystal induced arthropathy and fracture or conditions evolving over years and in need of minimal intervention like Osteoarthritis.

Our approach to arthritis should aim at anatomic localization of origin of the complaint i.e. articular Vs non-articular; determination of nature of the pathologic process, i.e. inflammatory Vs non inflammatory; Assessment of extent and distribution of involvement i.e. monoarticular / Polyarticular / Focal or widespread; decide its duration i.e. Acute Vs Chronic and formulation of the differential diagnosis considering the most common disorder first.

Many arthritis of different nature resemble each other at the outset and some may take weeks to months to evolve into a readily recognizable diagnostic entity. Though symptomatic treatment is adopted initially, the specific management depends on the exact diagnosis of the underlying condition.
Arthritis, is one of the most common medical problems in the world. It is the leading cause of disability in U.S.A. Arthritis is derived from the Greek word "arthron" meaning joint and "itis" as we know is inflammation. Arthritis implies inflammation and destruction of joints affected singly or in combination such as tissue of the joint, cartilage, bone and synovial membrane.

Arthritis is the second most common cause of mostly occurring chronic disease next to cardiovascular ailments. Arthritis and rheumatism are amongst the oldest diseases affecting mankind. These are not exclusive diseases of the elderly and can affect persons at any age.

In United States of America, arthritis management costs $82 billion a year for providing medical assistance and taking into account of financial loss due to sick leave. In U.S.A one in every three adults, 65% male and 35% female of all ages suffer from one or the other types of arthritis and need medical care for unbearable pain.

Arthritis can strike a person and then vanish and reappear again or come as a periodic visitor. A person can have different forms of arthritis at different parts of the body at the same time.

The treatment of rheumatic disease and arthritis aims at relieve of pain and decrease in swelling, restoration of mobility and prevention of deformity. The treatment protocol consist of use of drugs, rest and exercise and surgery and splints.

The management of rheumatic disease and arthritis aims at relieve of pain and reduction in the swelling size, restoration of mobility and prevention of deformity. With proper drug therapy, performing surgery and applying splints where indicated and providing adequate rest and permissible exercise and health education: the patients are taken care of.

Prasanna Kumar Rathor
Secretary’s Commentary

ARTHRITIS, EVERYBODY’S DISEASE
Approach to a patient with Arthritis

B.K Das¹, R. Tripathy²

The musculoskeletal system is related to the entire spectrum of disorders connected with the bones, joints, muscles and manifests primarily with aches and pains. Nearly 30% of the population suffer from musculoskeletal disorders, and it has been estimated that approximately 45 to 60% of all consultations in general practice concerns evaluation of pain. There are several etiological reasons. The anatomical structures involved are manyfold as well. Therefore, the origin of pain could be directly related to the joint itself or could be due to structures in the vicinity of the joint. The structures in and around the joint that can cause pain are: bone, articular cartilage, capsule, bursae, tendon sheath, periosteum and insertion of tendon onto bones (enthesis) Fig 1. Arthritis is defined as inflammation of synovial tissue and inflammation of the surrounding structure is defined as periarthritis.

Simple clinical assessment can help in identifying the cause and the important points of differentiation are highlighted in Table 1. It is important to understand that any joint pain is not arthritis.

Table 1

<table>
<thead>
<tr>
<th>Clinical Feature</th>
<th>Articular pain</th>
<th>Non-articular pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of pain</td>
<td>Deep, circumferential, localized around joint</td>
<td>Localised to superficial non-articular structure or diffuse discomfort</td>
</tr>
<tr>
<td>Tenderness</td>
<td>Localized around joint</td>
<td>Sharply localized to soft- tissue structure causing pain</td>
</tr>
<tr>
<td>Pain on active movement</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Pain on passive movement</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Presence of joint</td>
<td>Often yes</td>
<td>No</td>
</tr>
<tr>
<td>effusion or synovial thickening</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint stability or crepitus</td>
<td>May be present</td>
<td>No</td>
</tr>
</tbody>
</table>

Fig 1: Pain sensitive structures in and around the joint

Fig 2: Sites of inflammation of a joint
The second point that will define further investigation and management strategy is to evaluate whether the involvement is inflammatory (arthritis) or non-inflammatory (arthralgia) in nature. Inflammatory joint pain or true arthritis is associated with joint swelling and stiffness. The stiffness is usually worse in the morning (early morning stiffness of more than 1 hr) or after periods of inactivity, which gets relieved by gentle exercise. The degree of stiffness does not correlate with the extent of inflammation but the duration does. The longer the duration of morning stiffness the greater is the extent of inflammation. Besides, inflammatory arthritis have a fluctuating course characterized by improvement and exacerbation, symptoms are also worse at night and associated with constitutional symptoms like tiredness, lethargy, poor appetite, weight loss, and low grade fever. Non inflammatory joint symptoms tend to be worse after activity, not associated with significant stiffness and are relieved on resting.

Table 2

<table>
<thead>
<tr>
<th>Inflammatory</th>
<th>Non-inflammatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rheumatoid Arthritis</td>
<td>Trauma</td>
</tr>
<tr>
<td>Spondyloarthritis (SpA)</td>
<td>Degenerative</td>
</tr>
<tr>
<td>The CTDs</td>
<td>Congenital</td>
</tr>
<tr>
<td>SOJIA</td>
<td>Joint hypermobility</td>
</tr>
<tr>
<td>Crystal induced Arthritis</td>
<td>Fibromyalgia</td>
</tr>
<tr>
<td>Septic or Infective Arthritis</td>
<td>Soft-tissue</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Rheumatism</td>
</tr>
<tr>
<td></td>
<td>Joint failure</td>
</tr>
</tbody>
</table>

The third principle of evaluation is to determine the cause of joint symptoms. Inflammatory causes could be due to immunological causes like connective tissue disorders (SLE, sjogrens, systemic-sclerosis, polymyositis, dermatomyositis), rheumatoid arthritis or spondyloarthritis, or due to inflammation triggered by crystals like gout and pseudogout or due to direct infection of the joints (sepsis). Non inflammatory joint symptoms could be due to : trauma, mechanical derangement, congenital defects, metabolic causes, hypermobility, soft tissue rheumatism or fibromyalgia. The single most important aspect in reaching a diagnosis of these disorders is based on a good history, a thorough clinical examination and finally some relevant investigations based on information gained by initial history and examination. It is worth re-emphasizing that a thorough and detailed history is extremely important in the evaluation of arthritis.

Like in most aspects of medicine, arriving at a diagnosis is both an art as well as a science. A sound background knowledge, keen observation and intuition significantly aid in the diagnostic process. Even before the history is taken important clues can be gained by observing the patient as he walks into the consulting room. What is the gait like ? Does the patient limp ? Is he stooped ? Does he have difficulty in getting up from sitting position ? Are they visibly swollen joints ? Furthermore, certain basic facts provide important clues to an underlying disease. The age of the patient is important. For example immunological disorders like polymyalgia rheumatica(PMR) and giant cell arteritis (GCA) are exclusively seen in patients above 55 yrs. Juvenile arthritis by definition occur only below 16 years. The sex of the patient also provides important clues. Most of the inflammatory joint disease (RA) and connective tissue disorders(SLE, Sjogrens etc) are seen mostly in women while spondyloarthropathies commonly affects males. Gout is virtually never seen in children and pre-menopausal women.

Once the basic facts have been noted, the pattern of joint involvement and related symptoms are correlated:

1) Is it arthritis or periarthritis ?
2) Is it inflammatory or non-inflammatory?
3) What is the duration of symptoms?
4) How many joints are involved : monoarticular, oligoarticular (less than 5 joints) or polyarticular(more than 5 joints)?
5) Involvement is additive or migratory ?
6) Onset is acute or insidious ?
7) Involvement of joints is symmetrical or asymmetrical ?
8) Is there spinal involvement ?
9) Is there extra-articular manifestations? Which system or organ is involved?

The significance of gathering all these information is highlighted in Table 3.
Acute arthritis has been defined as disease duration of less than 6 weeks. The most important causes are reactive arthritis, crystal induced arthritis (gout and pseudogout), septic arthritis and other forms of spondyloarthritis. While chronic arthritis defined as disease duration of more than 6 weeks involves a wide spectrum of disorders depending on the number of joints involved and symmetry.

Table 3

<table>
<thead>
<tr>
<th>Joint involvement and related symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-inflammatory</td>
</tr>
<tr>
<td>Joint Pains</td>
</tr>
<tr>
<td>Monoarthritis (Single joint)</td>
</tr>
<tr>
<td>Septic arthritis; Crystal arthritis; SpA</td>
</tr>
<tr>
<td>Polyarthritis (Multiple joints)</td>
</tr>
<tr>
<td>Reactive or post viral inflammatory arthritis</td>
</tr>
<tr>
<td>Monoarthritis (Single joint)</td>
</tr>
<tr>
<td>Tuberculosis; Septic arthritis; Villo-nodular synovitis; synovial tumors</td>
</tr>
<tr>
<td>Polymyalgia(Multiple joints)</td>
</tr>
<tr>
<td>All cases of chronic inflammatory joint diseases</td>
</tr>
<tr>
<td>Osteoarthritis; Congenital; Fibromyalgia</td>
</tr>
<tr>
<td>CHRONIC (&gt;6wks)</td>
</tr>
<tr>
<td>Most of the chronic inflammatory joint diseases</td>
</tr>
</tbody>
</table>

Examination of the joints is based on the GALS method of examination, where G stands for gait, A for arms, L for lowers limbs and S for spine. Arthritis could be a manifestations of several systemic diseases. Having determined the pattern of joint involvement further examination of other system is mandatory. It is also necessary to assess the disease severity and functional disability by various scoring system validated worldwide.

Investigations:

Laboratory investigations in rheumatic diseases are an important adjunct to the clinical diagnosis. The mere presence or absence of a laboratory abnormality does not confirm or exclude a diagnosis. Diagnosis is made from the history, clinical findings along with the investigations.

Tests should be ordered only when the probability of a disease, based on clinical examination is very high. Tests have limited utility for diagnosis but are very useful for monitoring and treatment.

Many tests are available to measure different markers of diseases like non-specific inflammatory markers, autoantibodies, synovial fluid examination and radiograph.

In any musculoskeletal disorder it is essential to differentiate between inflammatory and non-inflammatory conditions. This is determined by the following tests:

1. ESR
2. Acute phase reactants like CRP, Complements 3 and 4.

ESR: This is a reliable indicator and is measured by Westergreen method. Raised values indicate inflammation whereas normal values suggest increased probability of non-inflammatory conditions like mechanical pain.

CRP: This is a sensitive and early indicator of inflammation. It helps in differentiating infection from disease activity in SLE being high in infection and low in lupus flare.

Complements: levels of complements are elevated in most inflammatory conditions as a result of acute phase response but are decreased in diseases associated with complement activation where complements are consumed as in SLE.

CBC: Assessment of Hb, TLC, DC and platelet is extremely important in the management of arthritis. Connective tissue disorders, notably SLE causes pancytopenia while vasculitis is characterized by leukocytosis and thrombocytosis. Effect of drug on the bone marrow is noted from CBC.

Urine: Urine examination is important in the assessment of arthritis associated with connective tissue disorders causing nephritis. Routine examination and 24hrs urinary proteins provides vital information.

Autoantibodies:

These serve as markers for autoimmune diseases. Few of these have a clear diagnostic significance. Many are not specific for any clinical syndrome and often they may not be detected in patients with autoimmune diseases. At times they are found in normal individuals.

Rheumatoid Factor: Positive in 70 - 80% of adults diagnosed with rheumatoid arthritis. Less than 10% positivity in juvenile rheumatoid arthritis. It can also be positive in other rheumatological and various non-rheumatological conditions.
Anti Nuclear Antibody (ANA): These are antibodies against different nuclear antigens like histones, dsDNA, ribonucleoproteins etc. They are detected by indirect Immunofluorescent (IIF) assay. The pattern gives an idea of the antigens targeted. Use of ELISA for ANA detection has a sensitivity of 60-80% as compared to 95% by IIF. Presence of ANA increases the likelihood of an autoimmune disease. As it is positive in 98% of lupus patients, a negative result usually excludes the diagnosis of Lupus. A positive ANA does not confirm SLE. It can occur in many autoimmune diseases and also in normal persons.

Antibodies to dsDNA and Sm are diagnostic of SLE. Similarly presence of anti-centromere antibodies are diagnostic of limited cutaneous scleroderma.

ANA should not be used for screening a confusing case.

ANCA: These are antibodies directed against components of neutrophil cytoplasm by IIF. It is useful for the diagnosis of systemic vasculitis and glomerulonephritis. Two patterns have been identified-cytoplasmic ANCA (c-ANCA) against PR3 antigen and perinuclear ANCA (p-ANCA) against myeloperoxidase (MPO).

Serum Uric Acid: Gout is often misdiagnosed on basis of raised serum uric acid levels. In the absence of clinical evidence of gout raised uric acid is categorized under asymptomatic hyperuricaemia and should not be treated unless levels are more that 12mg/dl in males and more than 11mg/dl in females. Uric acid estimation should not be advised in children and premenopausal women. Interestingly, 50% of patients with acute gouty arthritis may have normal uric acid.

ASO antibody: This primarily demonstrates antecedent streptococcal infection. Rising titres must be demonstrated in two test samples taken at four week interval. Mere presence of high ASO titres is not rheumatic fever. Rheumatic fever should be diagnosed on the basis of recommended Jones's criteria.

Clinical assessment is of primary importance. A close cooperation between the clinician and laboratory personnel is essential for proper diagnosis.

Synovial Fluid examination: Cell count and cell type will help in differentiating inflammatory from non-inflammatory arthritis. Demonstration of bi-refringent crystals under a polarized microscope helps in the diagnosis of gout. Other crystal induced arthritis like CPPD can be diagnosed. Synovial fluid examination is also very important in the diagnosis of Septic arthritis.

HLA B27: This is an important marker in the diagnosis of spondylo-arthritis. Sacroiliac joint inflammation and HLA B27 are the two major criteria in the diagnosis of spondyloarthitis.

Imaging: X-rays of the affected joint, ultrasonography, CT and MRI are important imaging tools in the diagnosis of arthritis. Demonstration of X-ray evidence of erosion takes over 6 months, therefore, plain x-rays are not indicated in early arthritis. However, musculoskeletal ultrasonography and MRI can detect lesions very early and needs to be done where there is a diagnostic dilemma.

Treatment: The fundamental principle of treatment of arthritis depends on proper diagnosis. Firstly, whether it is inflammatory or non-inflammatory and then the cause of the condition. Rational and scientific treatment emerges out of these distinction. Most non-inflammatory conditions like osteoarthritis, spondylitis, ligament sprain/injury, hypermobility syndrome, fibromyalgia and soft tissue rheumatism require analgesics like paracetamol, tramadol, tricyclic antidepressants and extensive physiotherapy. Physical rehabilitation is the hallmark of treatment of most of these conditions. Besides, education of the patient explaining the nature of disease, counselling goes a long way in helping most of the chronic problems which may become bothersome to treat. It is mandatory to avoid NSAID (Nonsteroidal anti-inflammatory drugs), steroids, and disease modifying agents or else risk of long term adverse reactions. The fundamental point to be noted is define a correct diagnosis based on criteria and then treat. Treating terms like 'arthralgia' and 'polyarthritis' is unacceptable.

Management of inflammatory arthritis is more precise because the diagnosis is based on well established criteria. Depending on the disease the management is outlined. Four important groups of drugs are usually prescribed:

1) Non-steroidal anti-inflammatory drugs (Naproxen, Diclofenac, etoricoxib etc)
2) Glucocorticoids
3) DMARDS (Disease modifying anti rheumatic drugs) like methotrexate, hydroxychloroquine, sulfasalazine,leflunomide.

4) Biologicals like infliximab, etanercept, rituximab etc)

The guidelines for starting the individual drugs have been categorically defined. The most used and abused drugs are NSAIDs and steroids which results in many long term complications. Drug induced adverse reactions are a major cause of iatrogenic morbidity and mortality worldwide.

These caveats must be remembered before starting treatment for arthritis which will help the patient in adhering to long term treatment minimizing side effects.

Rheumatism is a much maligned and misunderstood term. Similarly arthritis is believed to be a single disease which needs a single prescription of anti-inflammatory drugs or steroids. One must understand that it is not a single disease. There are over 500 causes arthritis/arthropathies on whose foundation the specialty of Rheumatology has grown. The more we learn the more we grow. And this is the basis of learning.

Further reading:
1) American College of Rheumatology Ad Hoc Committee on Clinical Guidelines for the initial evaluation of the adult patient with acute musculoskeletal symptoms. Arthritis Rheum 39:1,1996
Definition:

Low back pain is defined as an acute, subacute or chronic discomfort localized to the anatomic area below the posterior ribs and above the lower margins of the buttocks.\(^1\)

Prevalence:

The prevalence of backache is greater than 70% in most industrialized countries.\(^2\) Unfortunately we have no Indian statistics. It's a cause of increased morbidity, occurring once in lifetime in most people. Majority of cases resolve in 6 weeks with or without treatment. Upto 85% of patients cannot be given definite diagnosis because back pain is a symptom rather than a disease. Usual age is 30-50 years occurring due to ageing and degenerating process, sedentary life styles, lack of exercise. In younger age it's mostly due to trauma, infection, tumour and infiltrative lesion. Referred pain from abdominal or genito-urinary organ and backache as a part of systemic disease can affect any age.\(^3\)

Function of the Spine:

The human vertebrates defines itself as biped because of the spine. It provides stability to the body around which all co-ordinated activities take place. At the same time it provides flexibility by helping in lifting and walking, thus making it vulnerable to injury. Besides it also serves as a conduit for neural structures.

The human species has evolved in human being distinguishing it from other mammals as bipeds. It serves two major function- It is the main framework around which all coordinated activities take place while itself it helps in movements like walking and lifting. The former provides stability and latter flexibility. These are two opposite actions which put spine at risk of injury.

Anatomical Consideration

The thoracolumbar spine consists of anterior vertebral column and posterior vertebral column. The anterior vertebral column consists of vertebra and intervertebral disc which allows motion mostly in the form of flexion, with limited degree of extension, lateral bending and rotation. It's the weight bearing structure. The disc which consist of nucleus pulposus & annulus fibrosus also helps to absorb shock. The annulus is thinnest in posterior direction, hence herniation is more common posteriorly. The posterior vertebral column consists of lamina, pedicle and facet joint, transverse process and spine. It serves as an anchoring chain for muscles, ligaments and tendons and by limiting movement provides stability. The posterior longitudinal ligament narrows from L2 to L3, hence most disc problem occurs in L4-L5 or L5-S1 regions. The intervertebral foramen is the space between pedicles and articular surface of facet joints. 35-50% of the intervertebral foraminal space are occupied by spinal nerve roots.

Causes

- Myofascial lower back pain.
- Lumbar disc related pain
- Lumbar spinal stenosis
- Facet Syndrome
- Lumbar spondylolysis and spondylolisthesis
- Spinal deformities.
- Infections
- Neoplastic causes
- Inflammatory,
- Referred pain from lower abdominal and pelvic organ,
- Due to metabolic and rheumatic conditions.
- Failed back surgery syndrome
Pathogenesis:
- Disc herniation - Pain from disc herniation can arise from nerve root compression, from stimulation of nociceptor in the annulus fibrosus / post long ligament. Contrary to the general belief a simple disc prolapse cannot be the mechanism of pain due to disc disease. It has also been seen that resolution of symptoms occur even though compression continues. Contrarily radicular pain can occur without disc herniation. Hence vascular compromise, inflammation & biochemical influence have been identified as the underlying mechanism.
- Following a degenerative change or tear or fissures in the annulus fibrosus due to any reason; NP enters annulus fibrosus, sets up inflammatory reaction, followed by nerve invasion and nociceptor stimulation. This results in a painful disc or Discogenic pain. The nucleus pulposus on coming in contact with nerve root set up inflammatory reaction there resulting in radicular pain.

Classification:
Management: Depends whether it is acute or chronic.

ACUTE BACK PAIN is the pain which lasts less than 4 weeks of treatment. It is usually self limiting.

Cause: Usually occurs due to stress or injury to muscles or ligaments.

FEATURES Pain, tenderness and contraction of muscles is usually localised. Aim is to decrease pain, restore proper function & strength back and prevent recurrence of the injury.

Investigations: Normally do not require any investigation to diagnose these cases unless there are signs of red flag.

Treatment: Patient should contact doctor if pain does not reduce substantially 72 hours after self care.3

Red Flags:
1. Recent significant trauma. 2. Milder trauma if age is greater than 50years. 3. Unexplained weight loss. Unexplained fever. Immunosuppressant. 4. Previous/current cancer. 5. Intravenous drug use. 6. Osteoporosis. 7. Chronic corticosteroid use. 8. Age>70years. 9. Focal neurological deficit. 10. Duration greater than 6 weeks

SELF CARE consists of- 1. ICE & HEAT 2. BED REST - For 1-2days. Bed rest is only effective in managing acute disc prolapse or nerve root pain. Bed rest with traction is not effective. 3. EXCERCISES- Gentle exercises, strengthening and flexibility exercises. 4. MEDICATION - NSAID, muscle relaxant,anti convulsant, anti depressant and opioids. 5. TENS 6. USG 7. SHORT -WAVE DIATHERMY 8. ACUPUNTURE

Chornic Pain:

Cause: Multi factorial disorder with many possible etiology.

Features: Biological, Psychological & social component. The pain may be somatic pain, referred pain or radicular pain. Other symptoms are characteristic of underlying cause.

Investigation: X-RAY, CT SCAN, MRI, Bone scans, myelography, electro physiology studies, HLA, ANA and other blood & diagnostic test. Diagnosis by Diagnostic interventions

Treatment: Variable. Chronic low back ache is a diagnostic dilemma in 85% of patients, even in experienced hands with all the available technology. Low back pain can exist alone or with pain in the lower extremity; the lumbar radiculopathy. Therapeutic interventional procedures following a diagnostic interventional block has revolutionized the management of low backache by identifying the source of pain and predicting whether a therapeutic block is going to be beneficial or not. Even then it is a diagnostic dilemma in 85% patients in the most experienced hand.

Low backache can exist alone or with pain in the leg called lumbar radiculopathy.

Lumbar Radiculopathy:

It is a clinical syndrome which results due to any lesion that affects lumbosacral nerve roots and give rise to pain, numbness, motor loss depending on which nerve roots is affected. It includes -
Disc related pain, Central spinal stenosis, Lateral recess stenosis with nerve entrapment, Sacroiliac and piriformis syndrome, Facet joint pain.

**Incidence:**
- Facet joint pain - 24% - 40%
- Discogenic pain - 26%
- Sacroiliac joint pain - 2%-6%
- Nerve root pain - 13% -20%
- No cause was identified in 13% -19%


**Disc Related Pain**

**Cause:** Disc herniation, Disc degeneration, Internal disc disruptions (Discogenic pain)

**Symptom:** back pain and radicular pain

**Diagnosis:** MRI Disc bulge and disc herniation. Contrast enhanced MRI - Inflammatory Changes surrounding affected nerve. CT myelography - Spinal stenosis EMG - Signs of denervation and Muscle innervations Neurophysiologic study -Differentiate nervous system level of involvement and identification of particular segment.

**Diagnostic Interventional Procedure:**
- Includes Epidurography - In which epidural space is visualized under by injecting or dye.

**Typical Christmas Tree Appearance:** Under fluoroscope is absent in this patients. Other diagnostic procedures are
- Transforaminal epidural steroid, Caudal epidural steroid, Provocation discography

**Treatment:**
- Physical modalities like traction, manipulation, is not well studied. Effectiveness of exercise is not determined. Surgery role discectomy and microdiscectomy is limited to pure disk herniation. Interventional technique is the preferred choice in most cases as transforaminal epidural steroid, caudal epidural steroid and interlaminar epidural steroid

**Lumbar Facet Syndrome:**
- Contributes 15% to 45% of patients with back pain.- Pain occurs in lumber zygapophyseal joint. It is one of the best studied and strongly validated entities in the specialty of pain medicine.

**Symptoms:**
- Pain -segmental,-unilateral. Tends to radiate inferolaterally from site of stimulation, in upper lumber lesion, pain in loin and posterior superior iliac spine in lower lumbar region pain in Iliac crest and buttock .There is pain on extension.

**Diagnosis:**
- CT - Degenerative joints may not be always painful, X-RAY may be positive even in asymptomatic patients, Disc narrowing, Capsule tears, Features of associated ankylosing spondylitis, RA. As the facet joint is innervated by the medial branch of dorsal rami of spinal nerve diagnostic medial branch block is helpful in predicting a successful medial branch neurotomy.

**Treatment:**
- No evidence that conservative therapies of any kind relieves zygapophyseal joint pain, No evidence that fusion of segment relieves pain, Treatment is limited to minimally invasive procedures.

**Sacroiliac Joint Pain:**

**SYMPTOM** - Pain in buttock, trochanter & posterior thigh.

**DIAGNOSIS** -
- Radiography - Inflammatory changes in SI Joint.
- RI bone scan, blood test for HLA- B 27
- Diagnostic Intervention - SI joint block

**TREATMENT** - Conservative, SI Joint block, SI Joint radio frequency

**FBSS:**
- This refers to the category of patients who - after having had one or more operations of spine have had their initial complain appears to have been made worse rather than improve.
- pain may persist
- change in character
- It may follow one or more laminectomy, descectomy, decompression, spinal fusion, minimally invisible surgery.
Treatment

Epidural injection of corticosteroids / adhesiolysis. Nerve root block, Spinal cord stimulation, Intrathecal & epidural infusion of opiates, Sympathetic block

Arachnoiditis & Related Condition:

It is an inflammatory condition of the arachnoid

Cause: Procedures invading spine. Myelography, Bacterial Infection of spine, Neuraxial anaesthesia, Interventional procedures, Surgical interventions, Intrathecal antibiotics.

Diagnosis: Radiology - MRI - Enhanced nerve roots, CT Myelogram- Stellar appearance, Epiduroscopy, Myeloscopy

Treatment:

Conservative - Anticonvulsants - gabapentin, topiramate & phenytoin, propranolol, Acupuncture, Anticholinergic.

Interventional Technique

Spinal cord stimulation, Non implantable & Implantable pumps.

Spondylolysis & Spondylolisthesis

It's Stress Fracture- (Spondylolysis)

When pars defect develops vertebrae denied the restraining function of IAP.

Spondylolisthesis

Anterior vertebrae dislocates into forward translation, Resultant dislocation is known as spondylolisthesis. Pain occurs due to - Stretching of nerve roots, narrowing of iv foramina, Flail lamina impinging on nerve roots.

• Diagnostic

Radiographic view - Oblique view - Pars interarticulars corresponds to 'Neck of Dog' # appears as necklace around the 'Dog’s neck'. Bone scanning - to detect abnormalities that precede actual fracture required to avert actual #. Bone scan will show hyperemia +ve for stress reaction.

• Treatment

Persistent pain of the pars fracture by various means succeed rate 80%. LA blocks of pars # may be diagnostic but not therapeutic.

Tumors of The Spinal Column

• Symptoms: Nocturnal pain or pain with recumbency. Increased pressure associated with increased blood flow at night possible mechanism. Stretching of spinal nerves over an expanding mass. Metastatic lesion more common; ratio of met lesion : primary tumor is 2:1.

• Diagnosis: Radiographic diagnosis, Histological examination

• Treatment

Intrathecal drug delivery

Gained popularity since discovery of Opioid. Provides targeted delivery of medication. Avoids side effects encountered by systemic administration of drug. Medication also includes - LA, Clonidine, Midazolam, Baclofen. Can be kept for 3-6months.Opioids & drugs are delivered surgically implanted SC pump, containing reservoir for medication.

• Indication

Intolerable side effects. Life expectancy of more than 3months. No obstruction in flow of cerebrospinal fluid. Neuropathic cancer pain that does not respond to oral regimen and nerve blocks. In nonmalignant pain as a last resort.

Interventional Technique in the Management of Chronic Low Back Pain

Definition- Interventional pain management is defined as the discipline of medicine devoted to the diagnosis and treatment of pain and related disorders with the application of interventional techniques in managing subacute, chronic, persistent and intractable pain independently or in conjunction with other modalities of treatments.

EVALUATION

HISTORY
Pain History
Medical History
Psychosocial History

ASSESSMENT
Physical Examination
Functional Assessment
Psychosocial Assessment

Impression
Pain physician 2009; 12:225-E264. ISSN2150-1149
An Algorithmic approach for clinical management of chronic spinal pain L. Manchikanti, S. Helm
• Diagnostic Testing

Imaging techniques - X-ray LS spine, CT Scan, MRI, myelography, Triphasic bonescan. EP Study Electromyography, Nerve conduction, Somatosensory evoked potentials.

Blood Tests-of underlying medical conditions.

CONTROLLED DIAGNOSTIC INTERVENTIONAL TECHNIQUE

<table>
<thead>
<tr>
<th>Lumbar facet joint block</th>
<th>Sacroiliac joint blocks</th>
<th>Lumbar provocation discography for discogenic pain.</th>
</tr>
</thead>
<tbody>
<tr>
<td>for facet joint pain</td>
<td>for sacroiliac joint pain.</td>
<td>Evidence level- II-2</td>
</tr>
</tbody>
</table>

**Indications**

- Somatic: non- radicular low back and lower extremity pain of at least 3months.
- Pain level < 6 (0-10 scale)
- Pain causing functional disability.
- No response / disability to under go conservative management.

<table>
<thead>
<tr>
<th>Lumbar facet joint block</th>
<th>Sacroiliac joint blocks</th>
<th>Lumbar provocation discography for discogenic pain.</th>
</tr>
</thead>
<tbody>
<tr>
<td>for facet joint pain</td>
<td>for sacroiliac joint pain.</td>
<td>Evidence level- II-2</td>
</tr>
</tbody>
</table>

- Maximum pain below L5, vertebra.
- Somatic referred pain in the lower limb. / -
- Pain not relieved with conservative therapy.
- No other possible diagnosis is likely.
- Diagnose + less invasive method.

- Exclusion of other sources of lumbar pain.
- Identify that disc should be targeted.
- Few many discs not involved.

**Positive response**

- 80% pain relief
- Ability to perform painful movement.

**Caudal epidural injection**

It is done for Discogenic pain and result is as good as disc herniation, spinal stenosis, post lumbar laminectomy syndrome.

**If there is evidence of radiologic Spinal stenosis Demonstrable causes leading to radiological – Transformalinal epidural injection**
THERAPEUTIC INTERVENTION

1A - Strong recommendation high quality evidence
1B - Strong recommendation moderate quality evidence
1C - Strong recommendation low quality or very low quality evidence

1A
- Lumbar facet joint nerve blocks to provide both short-term and long-term relief in the treatment of chronic facet joint pain
- Lumbar epidural steroid injections for post-lumbar laminectomy syndrome and spinal stenosis
- Percutaneous adhesiolysis post-lumbar surgery syndrome
- Spinal cord stimulation on a long-term basis

1B
- Lumbar RF neurotomy for facet joint pain
- Lumbar transforaminal epidural injection for chronic low back and lower extremity pain
- Spinal endoscopic adhesiolysis in post-lumbar laminectomy syndrome
- Percutaneous disk decompression - automated percutaneous lumbar discectomy (PLDD)
- Percutaneous lumbar endoscopic discectomy (PLLD)
- Implantable intrathecal drug administration system
- Lumbar interlaminar epidural injection for disc herniation and radiculitis

1C

CONT'D

2A
Intermittent electrotherapy
- Radiofrequency neurotomy for sacral joint pain
- Nerveoplasty - for radicular pain due to contained disc herniation

2B
Lumbar interlaminar epidural injection for spinal stenosis and discogenic pain without disc herniation and radiculitis

No recommendations
- Intracavitary facet joint injection
- Intracavitary sacroiliac joint injection
- Intracavitary facet injection
- Radiofrequency posterior annuloplasty

2A - Weak recommendation high quality evidence
2B - Weak recommendation moderate quality evidence
2C - Weak recommendation low quality or very low quality evidence

DELIVERY OF INTERVENTIONAL TECHNOLOGY AND FREQUENCY OF INTERVENTIONS

- Medial branch block, epidural injections, outcome not different with or without steroids
- RF neurolysis and disk decompressions do not require steroids
- Common steroids are methylprednisolone, triamcinolone acetonide, betamethasone, acetate and phosphate mixture

Frequency and total number of injections -
- Facet joints - Two procedures at intervals of at least 2 weeks (preferrably)
- T-Interval 2-3 months or longer if relief is 50% for 6 weeks after D block
- Epidural - 1-2 procedure interval 1-2 weeks
- T-Interval 2-3 months if 50% relief for 6 weeks
- SI Joint injections - D-Two injections interval 1-2 weeks
- T- injection at intervals of 6 months or more if pain relief <50% for 6 weeks (maximum 4-6 times per year)
- PC Adhesiolysis - Two interventions per year as a daily protocol
- Spinal endoscopy adhesiolysis - Two interventions per year if pain relief <50% for 6 months

REFERENCE

1. David Borenstein, Low back pain: Pain Management, Steven D. Waldman vol-2, 2007; 82-749
Psoriasis (from the Greek word "Psora" i.e. Scales) is a chronic inflammatory cell mediated disease affecting skin & joints, histologically characterized by epidermal hyperplasia, abnormal differentiation of keratinocytes, angiogenesis and presence of neutrophils. The lesions commonly present as raised inflamed erythematous plaques covered by white silvery scales usually on the extensor surfaces of limbs like knees, elbows, lumbosacral region, scalp etc. Subjective symptoms such as itching or burning may be present and may cause extreme discomfort. The occurrence of arthritis in patients with psoriasis has been recognized since the 19th century.

The percentage of patients with psoriasis which have psoriatic arthritis varies between 5% and 42%.\[1\] In 70% of the patients, arthritis symptoms develop years after skin changes occur, in 10% to 15% of cases arthritis precedes psoriasis (significant family history of psoriasis is useful for the diagnosis) and in 15% of the patients the initial presentation includes arthritis and psoriasis together.\[2,3\]

Definition :

Psoriatic Arthritis (PsA) is an inflammatory musculoskeletal disease that affects people with psoriasis or their near relatives. It affects musculoskeletal structures like the peripheral and axial joints, entheses and tendon sheaths, the eye and the mucous membranes are also involved. Originally Moll & Wright defined PsA also named as sero-negative arthritis as an inflammatory arthritis associated with psoriasis, with a negative test for rheumatoid factor.\[4\] Psoriasis vulgaris is the most frequent form of psoriasis associated with PsA, but pustular and guttate psoriasis have also been reported. Only 35% of patients with PsA has a relationship between the extent and severity of psoriasis and joint manifestations.\[3\] Extra-articular manifestations of PsA include conjunctivitis or iritis (in 7 - 33% of cases) and aortic incompetence (in <4% of cases) that may occur late during the course of PsA.

Epidemiology :

Psoriatic arthritis tends to appear about 10 years after the first signs of psoriasis. For the majority of people this is between the ages of 30 and 55, but the disease can also affect children. The onset of psoriatic arthritis symptoms before symptoms of skin psoriasis is more common in children than adults. Men and women are equally affected by this condition. Like psoriasis, psoriatic arthritis is more common among Caucasians than African or Asian Americans.

Etiopathogenesis :

Pathogenesis of PsA is unknown but some triggering factors may play role in the evolution of disease. Triggering factors include:

1. Genetic Predisposition
2. Immunological factors
3. Environmental factors

Genetic Predisposition :

Approximately 40% of patients with psoriasis and PsA have a first-degree relative with disease.\[5\] The following important genetic susceptibility 10c have been elucidated \[5,6,7\]

- a) HLA-Cw6 Earlier age of onset of Psoriatic arthritis \[6\]
- b) HLA-B27,HLA-B38,HLA-B39 \[7\]
- c) HLA-DR4, Polyarticular from of PSA \[5\]

The following associated gene polymorphisms are also thought to be associated with PsA:\[8, 9,10\]
a) TNF- ? promoter [8]
b) MHC Class-I chained related gene A (MICA) [9]
c) Caspase-activating recruitment domain (CARD)[10]

Immunological Factors :

Immunologic factors have been implicated in the joint lesions. This is demonstrated by synovial lining cell hyperplasia and mononuclear cell infiltration. T-Cells in plasma and synovium are mostly CD 8+ and are activated with expression of HLA-DR molecules and IL- 2 receptors.[14] Moreover, these cells contribute to produce several pro-inflammatory cytokines including IL-1B, IL-2,IL-10, IAN-? and TNF-?.[15] These cytokines induce proliferation and activation of synovial and epidermal fibroblasts. The immunological response that occurs in PsA patient is due to molecular mimicry between streptococcal antigens and epidermal auto antigen.[11] Exacerbations of PsA have been reported in the context of HIV infection, however the viral role is not clear.[12]

Environmental Factors :

Environmental factors like trauma may precipitate arthritis. There is worsening of skin lesions and arthritis in the winter season.[13]

Classification Of Psoriatic Arthritis :

Moll & Wright first described in 1973 five clinical patterns of joint involvement including:[16]

1) Assymetric oligoarthritis ( < 5 joints involved)70%
2) Symmetric Polyarthritis (? 5 joints involved)2-3%
3) Distal interphalangeal (DIP) Joint arthritis5-7%
4) Arthritis Mutilans5%
5) Spondyloarthritis (sacroiliac joints and apophyseal joints of the spine)15%

Clinical Features :

Several patterns of joint involvement may occur in the same patient or many patients may undergo over time a change in pattern of their arthritis. [17, 18]

Signs and Symptoms :

The predominant clinical manifestations of PsA include peripheral arthritis, axial disease, dactylitis and enthesitis, besides the skin and nail psoriasis.

- Pain, swelling or stiffness in one or more joints.
- Joints that are red or warm to touch
- Sausage like swelling in the fingers or toes, known as dactylitis.
- Pain in and around the feet and ankles, especially feudalities in achilles tendon or plantar fasciitis in the sole of the foot.
- Change to the nail, such as pitting
- Pain in the area of sacrum

Differential Diagnosis:

1) Rheumatoid Arthritis ( RA)
2) Osteoarthritis ( OA)
3) Ankylosing Spondylitis (AS)
4) Gout.

Features differentiating from RA :

- Distribution of involved joints of an affected joint is in a "ray" pattern with all three joints of affected digit whereas other digits are spared.[19] This contrast with the symmetrical distribution of RA, in which the same joints on both hand and feet are affected.
- Degree of tenderness in patients with Psoriatic arthritis is less than that of RA. [20]
- In contrast to RA a typical clinical feature of Psoriatic arthritis is the reddish/purplish color of the skin on the affected joint.[21]

Features differentiating from OA :

- DIP involvement in OA usually present with pain which is usually non inflammatory in nature whereas DIP involvement in Psoriatic arthritis patient is typically inflammatory.

Features differentiating from AS:

- Spondyloarthropathy of Psoriatic arthritis can be differentiated from that of AS by the presence of the peripheral arthritis asymmetrical nature of the syndesmophytes as well as sacroiliac involvement.
- Spondyloarthropathy of Psoriatic arthritis tends to be less symptomatic than that of AS.[22]

Diagnosis:

The disease has varied manifestation that makes diagnosis and assessment sometimes difficult. According
to the CASPAR criteria, presence of three of the following five features in a patient with inflammatory articular disease (joint, spine or entheses) are required to make a diagnosis of PsA.\(^{[23]}\)

1. Current psoriasis or personal history of psoriasis in the patient or family history of psoriasis.
2. Psoriatic nail dystrophy including onycholysis, onychodystrophy, pitting, ridging and hyperkeratosis.
3. A negative test for rheumatoid factor.
4. Current or past history of dactylitis (sausage-like swelling of fingers or toes). Arthritis symptoms in the distal interphalangeal articulations of hands,
5. Radiological evidence of juxta articular new bone formation or joint changes.

Other symptoms that are more typical of PsA than other forms of arthritis include inflammation in achillis tendon or plantar fascia.

**Radiographic findings**:\(^{[24]}\)
- Osteolysis which results in whittling away of phalanges, metacarpals and metatarsal.
- Acroosteolysis along with new bone formation.
- Phalanges show splaying of their bases causing 'fish tail' deformity or more commonly 'Pencil in cup' deformity.
- Erosions may also occur in the bone, Early erosion occur sub-articularly. Articular cartilage is often spared in the destructive process.
- Asymmetrical Sacroilitis and rarity of 'Bamboo Spine' when spine is involved.

**Management**:

Management plans begins with educating the patient that the condition is chronic, inflammatory in nature and that consistent therapy is required.\(^{[24]}\)

1. **NSAIDS**: Typically the medications first prescribed for PsA are ibuprofen and naproxen followed by more potent NSAIDS like diclofenac, indomethacin etc. Cox-inhibitors should be avoided in patients with risk factors with coronary artery disease.
2. **Other medications that may control skin & joint disease in PsA**: In addition to methotrexate and cyclosporine, retinoids and PUVA are used.
3. **Disease modifying anti-rheumatic drugs (DMARDS)**: This class of drugs helps limits the amount of joint damage in addition to reducing pain and inflammation occuring PsA. DMARDS include - immunosuppressants like methotrexate, cyclosporine, azathioprine, sulphasalazine, leflunomide and mycophenolate motefil.
4. **Biological response modifiers (BRM)**: Recently a new class of therapeutics called BRM or biologics has been developed using recombinant DNA technology which are derived from living cells cultured in a laboratory. They target specific parts of immune system. Biologics prescribed for PsA are agents like anti-TNF-\(\alpha\) medications viz. etanercept, infiliximab, adalimumab, golimumab and alefacept. Biologics may increase risk of minor or serious infections; more rarely they may be associated with nervous system disorders, blood disorders or certain types of carcinomas.
5. **Corticosteroids**: Low dose corticosteroid therapy has been shown to slow the radiological progression, but it should be used judiciously as there is risk of flare-up of the disease after stopping them. Intra-articular corticosteroids can be given in oligoarticular or polyarticular disease with one or two active joints.
6. **Surgery**: Synevectomy may be considered in patients with refractory arthritis involving single joint. Joint replacement may be considered in patients with severe involvement of hip or knee joint.

Ideally the dermatologist and rheumatologist should work as a team to supervise all aspects of the patients disease. Patient education, early diagnosis, institution of early appropriate therapy, physiotherapy like hot and cold compress are the cornerstones of satisfactorily treatment outcomes.

**References**:


Rheumatoid arthritis (RA) is a chronic, systemic inflammatory disorder that may affect many tissues and organs, but principally attacks flexible (synovial) joints. The process involves an inflammatory response of the capsule around the joints (synovium) secondary to swelling (hyperplasia) of synovial cells, excess synovial fluid, and the development of fibrous tissue (pannus) in the synovium. The pathology of the disease process often leads to the destruction of articular cartilage and ankylosis (fusion) of the joints. Although the cause of rheumatoid arthritis is unknown, autoimmunity plays a pivotal role in both its chronicity and progression, and RA is considered a systemic autoimmune disease.1

Although there is a link between inflammation and the development of joint damage it is well established that damage may progress in spite of decreased inflammatory activity, and erosions may develop in patients who have few clinical signs of inflammation. Thus it has been suggested that pathological processes other than inflammation are involved in the destructive process. 2, 3

About 1-2% of the world’s population is afflicted by rheumatoid arthritis.4 women three times more often than men. In India alone there are some 10 million people with RA. Onset is most frequent between the ages of 40 and 50, but people of any age can be affected.

Rheumatoid arthritis (RA) characterized by local and systemic effects of inflammation has a wide range of biochemical markers implicated directly or indirectly to its pathogenesis. Rheumatoid arthritis (RA) is characterized by the presence of proinflammatory cytokines, tissue-destructive enzymes, and bone degradation products in the blood, synovium, and joints. Several markers are known to be related to disease progression in Rheumatoid Arthritis such as: Inflammatory markers like (C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), auto antibodies like anti-cyclic citrullinated peptide (anti-CCP) antibodies, rheumatoid factor (RF) of IgG, IgA and IgM, marker of cartilage turn over like cartilage oligomeric matrix protein (COMP), and osteoprotegrin-receptor activator of nuclear factor (NF)-êB ligand) etc. 5

C-reactive protein (CRP):

CRP an acute phase protein is synthesized by hepatocytes in response to proinflammatory cytokines in particular IL-6. It has been shown to be of great value as an inflammatory marker in RA and has been suggested to mediate part of the complement activation in RA.6

CRP levels are an even better indication than ESR of the amount of inflammation present. In people with rheumatoid arthritis, high CRP suggests that there is significant inflammation or injury in the body.

Both CRP and ESR levels are used to monitor disease activity and to monitor how well someone is responding to treatment.

Rheumatoid factor:

Rheumatoid factors are a variety of antibodies that are present in 70% to 90% of people with rheumatoid arthritis (RA). The presence of rheumatoid factor does not establish the diagnosis of RA but can be of prognostic significance because patients with high titers tend to have more severe and progressive disease. Rheumatoid factor (RF), however, can be found in people without RA or with other autoimmune disorders. In general, when no rheumatoid factor is present in someone with RA, the course of the disease is less severe. A negative RF does not rule out RA;
rather, the arthritis is called seronegative. Fifteen percent (15%) of patients are having seronegative arthritis. During the first year of illness, rheumatoid factor is more likely to be negative with some individuals converting to seropositive status over time.

**Anti - CCP :**

A new test for rheumatoid arthritis that measures levels of antibodies that bind citrulline modified proteins (anti-CCP) is more specific and tends to be elevated in patients with rheumatoid arthritis or in those about to develop rheumatoid arthritis. The presence of anti-CCP antibodies can be used to predict which patients will get more severe rheumatoid arthritis. Anti-CCP is better than RF in distinguishing RA from other rheumatic diseases, its cost, which is 3.3 times higher than the RF test precludes it from replacing RF as a serum marker for arthritis.

Cyclic Citrullinated Peptide IgG antibody (CCP-IgG) has a 98% specificity for RA, compared to 84% by RF. Specificity for RA approaches nearly 100% when CCP antibodies are combined with RF antibodies. High CCP-IgG concentrations are present within a year of disease onset in the majority of RA patients. CCP is predictive of RA development in patients with undifferentiated arthritis. Anti-CCP activity is a marker for cell mediated immunity. RA activity was measured spectrophotometrically at 630 nm and some studies observed the importance of ADA as a serum marker in addition to CRP for better therapeutic management of RA.

**HLA- B27 :**

HLA-B27 is a genetic marker. In people with inflammatory arthritis of the spine and joints (not osteoarthritis), a positive HLA-B27 test is associated with the presence of one of a group of diseases called seronegative spondyloarthopathies. This includes diseases such as ankylosing spondylitis (AS), psoriatic arthritis, and Reiter’s syndrome (also called reactive arthritis). HLA-B27 is present in about 90% of people with AS, but the gene can also be seen in people with no sign of arthritis or inflammation but better clinical response markers are needed to assist rheumatologists in selecting treatments most likely to benefit any particular patient.

**Intracellular adhesion molecule-1 (ICAM-1) :**

Soluble forms of ICAM-1, VCAM-1, and more recently, ICAM-3 are known to exist in human serum and have elevated levels in numerous diseases. Its level in serum was estimated by using sandwich ELISA. Several authors reported soluble adhesion molecules elevated in RA which only ICAM-3 correlates with disease activity.

**Cartilage Oligomeric Matrix Protein (COMP) :**

Cartilage Oligomeric Matrix Protein, a new serum marker for assessing cartilage destruction. COMP is a glycoprotein component of the articular cartilaginous matrix. When cartilage matrix is degraded
by disease, protein fragments are produced that diffuse into the joint fluid. These proteins, including COMP, subsequently appear in the circulation and can be used to monitor cartilage degradation in inflammatory joint diseases such as RA have been associated with response in RA patients treated with adalimumab. Cartilage oligomeric matrix protein (COMP) is quantified in serum by immunoassay. Measurement of COMP in serum early in the course of RA holds promise as a prognostic marker for development of joint destruction in this disease. High COMP concentrations (>15) indicate severe active cartilage breakdown and strong predictor of continued cartilage erosion.

ANA (Antinuclear antibody):

Antinuclear antibodies (ANAs) are unusual antibodies, detectable in the blood, that have the capability of binding to certain structures within the nucleus of the cells. ANAs are found in patients whose immune system may be predisposed to cause inflammation against their own body tissues. Antibodies that are directed against one’s own tissues are referred to as auto-antibodies. The propensity for the immune system to work against its own body is referred to as autoimmunity. ANAs indicate the possible presence of autoimmunity and provide, therefore an indication for doctors to consider the possibility of autoimmune illness. A positive ANA result can indicate an unusually active immune system. About 40% of people with rheumatoid arthritis have a positive ANA result. In the first few months of onset of rheumatoid arthritis, these immunologic tests may be negative, and, in some patients, they are always negative.

E-selectin:

Soluble E-selectin (sE-selectin) is a marker of activation of vascular endothelium. Patients with early RA are characterized by high concentrations of CRP and sE-selectin. Therapy with sE-selectin level is assessed using an enzyme linked immunosorbent assay (ELISA). sE-selectin levels were associated with CRP level helps in progression of joint destruction. E-selectine is a prognostic marker used after methotrexate therapy.

Soluble interleukin-18 receptor complex(sIL-18Ra):

The sIL-18Ra complex was isolated from blood serum using an anti-IL-18Ra monoclonal antibody affinity column. The purified sIL-18Ra was then examined using Western blot analysis. The sIL-18Ra complex could be a potentially useful biomarker for the diagnosis of RA.

Serum amyloid A:

Serum amyloid A (SAA) proteins are a family of apolipoproteins associated with high-density lipoprotein (HDL) in plasma. Different isoforms of SAA are expressed constitutively (constitutive SAAs) at different levels or in response to inflammatory stimuli (acute phase SAAs). These proteins are produced predominantly by the liver. Acute-phase serum amyloid A proteins (A-SAAs) are secreted during the acute phase of inflammation. These proteins have several roles, including the transport of cholesterol to the liver for secretion into the bile, the recruitment of immune cells to inflammatory sites, and the induction of enzymes that degrade extracellular matrix. A-SAAs are implicated in several chronic inflammatory diseases, such as amyloidosis, atherosclerosis, and rheumatoid arthritis. SAA increase within hours after inflammatory stimulus, and the magnitude of increase may be greater than that of CRP. Relatively trivial inflammatory stimuli can lead to SAA responses. It has been suggested that SAA levels correlate better with disease activity in early inflammatory joint disease than do ESR and CRP. SAA is a more sensitive marker of inflammation than is CRP. The role of the measurement of SAA as a monitor for inflammatory disease activity.

Matrix Metalloproteinase (MMP9):

Matrix metalloproteinases are a family of zinc and calcium-dependent endopeptidases that break down extracellular matrix proteins. The MMP9 is secreted as a 92kDa zymogen. Cleavage of ProMMP-9 results in the active enzyme, having a molecular weight of approximately 82kDa. MMP9 is produced by the several cell types: monocytes, macrophages, neutrophils, keratinocytes, fibroblasts, osteoclasts and endothelial cells. MMP9 is involved in inflammatory responses, tissue remodeling, wound healing, tumor growth and metastasis. MMP9 may also play an important part in local proteolysis of the extracellular matrix and in leukocyte migration, as well as in bone osteoclastic resorption. Thus Proteinases play an important role in the pathogenesis of joint destruction, and matrix metalloproteinases (MMP) are believed to play a crucial
role as they have the ability to degrade various compounds of the extra-cellular matrix of the joints, including collagen.

**Conclusion:**

Biomarkers assessed not only to determine the severity of inflammation but also to evolve targeted treatment strategies for better management of the condition. In early rheumatoid arthritis ESR/ C reactive protein, COMP, and the presence of IgA RF, anti-CCP, and anti-IL1a antibodies assessed at presentation provided prognostic information on future joint destruction. The laboratory measures used were selected to reflect different aspects of the disease process. The combination of markers was found to yield additive diagnostic and prognostic information.

**References:**

Abstract:

Ankylosing spondylitis is a chronic disease of the articular surfaces of the vertebral column. Other peripheral joints may also be affected. The disease causes fibrosis and ankylosis resulting in fixed deformities of the spine and other peripheral joints. Securing the airway can be challenging. Access to neuroaxis may be difficult. Regional nerve blocks may not be possible. Involvement of organs like the heart and lungs may cause perioperative complications as the disease also affects extra-articular tissues frequently. Administering general or regional anaesthesia to these patients can be difficult and pose a challenge to the anaesthetist.

KEY WORDS: Ankylosing spondylitis, bony deformities, difficult airway.

Introduction:

Ankylosing spondylitis (AS), otherwise known as Marie-Strumpell disease, or Bekhterev's disease or Bekhterev's syndrome is a chronic progressive inflammatory disorder of the articular surfaces of the axial skeleton though other peripheral joints and non-articular tissues may also be affected[1]. It is an autoimmune seronegative spondyloarthropathy, associated with HLAB27 tissue-type. Though it can affect both sexes, is seen in young male patients aged 20 - 40 years. Annular fibrous ossification of the articular cartilages of the vertebrae and intervertebral disks occurs resulting in fibrosis and ankylosis[2]. Besides spine AS also affects other joints like the hips, knees, shoulders, ankles, temporomandibular, costovertebral, sternoclavicular, costochondral and crico-arytenoid, etc. The heart, lungs, eyes, colon and kidneys are also affected. These patients may require surgery for correction of severe flexion deformities of spine, knee or hip joint replacements; or they may undergo surgery for other ailments in presence of AS. Due to bony deformities, accessing the airway and administering neuroaxial or regional blocks may be difficult; and besides, the patients might also have cardiovascular and respiratory complications, as well as those due to the medicines used for treatment of the disease[3]. So, providing safe anaesthesia is always a challenge in presence of AS.

Pathological Changes:

Ankylosing spondylitis causes sacroilits, peripheral arthropathy and enthesopathy in the absence of rheumatoid factor. Initially it affects the lumbar spine causing low-back pain and morning stiffness that improves on exercising[3]. Later it affects the thoracic and cervical spine and to quote O.C.R. Degrandi[4], lead to development of the 'skier' posture characterized by straightening of lumbar lordosis, accentuation of dorsal kyphosis, straightening of cervical lordosis with forward projection of the head. The interspinal ligaments calcify forming syndesmophytes. This results in bony bridges between the lumbar vertebrae that gives rise to the characteristic radiological appearance of 'bamboo spine'. These patients are susceptible to osteoporosis, compression fractures, hyperkyphotic deformity of the back, fractures on fall, and iatrogenic spinal cord injuries while transferring the patients or doing fracture reduction procedures[3].

Besides the spine, other peripheral joints are also affected resulting in deformities. Respiratory and cardiovascular systems are also involved. Incidence of death from respiratory complication is 2.5 to 3 times more[2]. Cardiovascular system is affected in 3.5% patients after 15years of disease and in 10% after 30years of disease[5]. 40% of AS patients suffer from recurrent unilateral acute anterior uveitis - the most frequent extra-articular manifestation[6]. They may also
suffer from Crohn's disease, ulcerative colitis, psoriasis and Reiter's syndrome and have fever, fatigue, weight-loss, elevated ESR, mild normochromic normocytic anaemia, elevated serum IgA and Alkaline phosphatase levels [3].

**Anaesthetic Considerations**

The anaesthetic management of patients with AS depend on:

- severity and extent of the disease
- degree of involvement of the airway
- patient positioning
- technical difficulty on providing neuroaxial and peripheral blocks
- associated cardiovascular and respiratory complications[6].

To quote A. Saringcarinkul, O.C.R. Degrandi and others, the implications of AS in anaesthetic practice are:

- Forward curvature of the thoracic spine and involvement of the sternoclavicular and costochondral joints may limit expansion of the thorax and thus decrease the breathing capacity.
- If the upper costovertebral joints are affected, then lung capacity may be further restricted.
- Ankylosed cervical spine causes restriction of head and neck movement.
- Mild extension and sudden movements of spine might result in fractures[7] through the ossified intervertebral disk spaces, thereby can cause complete transection of the spinal cord[4].

During pre-anaesthetic checkup the degree of residual cervical mobility should be assessed, neck movement should be checked, X-Ray of cervical spine should be done in lateral and maximal extension along with the other regular tests (degree of mouth opening, Mallampati grading thyromental and sternomental distance, Wilson index, etc) to predict difficult intubation[4].

- Forcible extension of the neck even under neuromuscular blockade should be avoided[8]. An assistant may stabilize the head during laryngoscopy and intubation to avoid vertebral fractures and when patient has vertebrobasilar insufficiency.
- Stiffness of cervical spine, atlanto-occipital, temporomandibular and crico-arytenoid joints may cause difficulty in tracheal intubation[2] as -
  - Sniff position may be difficult to attain,
  - Approximation of chest and chin due to cervical flexion may not allow adequate mouth opening,
  - Cervical flexion may hamper access to trachea and tracheostomy may be difficult to perform,
  - Hyperextension may fracture cervical vertebrae causing occult injuries,
  - Patients may have unstable atlanto-occipital joints and spinal stenosis,
  - Large anterior osteophytes may distort the airway and impair recognition of laryngeal structures[9],
  - Restricted mouth opening due to temporomandibular joint ankylosis[10],
  - Cricoarytenoid arthritis may result in dyspnoea, stridor and fixation of the vocal cord[5].

According to A. Saringcarinkul, these patients are not problematic for face mask ventilation. Difficulty is seen during laryngoscopy and intubation as there could be non-alignment of the oral-pharyngeal and laryngeal axes.

Preoperative indirect laryngoscopy should be done to detect probability of difficult intubation[2].

The various methods that can be employed in such situations are[2,11]:

- Blind nasal intubation
- Use of light wand/stylet
- Awake fiberoptic intubation
- LMA
- ILMA
- Bullard laryngoscopy
- Glidescope
- Retrograde intubation
- Surgical airway - tracheostomy
- Percutaneous transtracheal jet ventilation may be done when intubation fails to rapidly achieve effective ventilation.
Though LMA and ILMA are useful in case of difficult intubation, mouth opening less than 1.2cm, presence of large cervical osteophytes and fixed extension deformity of neck may limit their usage[3]. When the angle between the oral and pharyngeal axes are less than 90 degree, instead of LMA or ILMA, retrograde intubation / transtracheal jet ventilation / tracheostomy should be done[12].

Awake fiberoptic intubation is the safest technique to secure the airway.

Consent for tracheostomy should be taken preoperatively.

- Performing regional and peripheral anaesthesia may be difficult because[2,4,13,14]:
  - Interspinal spaces are obliterated.
  - Mobility of joints are hampered.
  - Proper patient positioning may be difficult.
  - Tracheal intubation may still be needed in case of high block, accidental intravenous local anaesthetic injection and failure of block.
  - High block may affect diaphragmatic and cardiovascular innervation.
  - Occurrence of spinal cord haematoma following epidural anaesthesia.
  - Seizure has been reported after accidental intraosseous injection in caudal anaesthesia.

However, epidural and spinal anaesthesia can be given for perineal and lower limb surgery[15]. As ossification of ligamentum flavum commonly does not take place in AS patients, spinal anaesthesia by lateral approach may be more successful[16,17]. AS patients have a narrow epidural space. So, local anaesthetics should be given slowly and in a small dose to avoid total spinal anaesthesia [3]. For upper limb surgery the axillary block is preferable[18].

Preoperative coagulation study should be done and patients should be followed up with repeated neurological examination to rule out spinal haematoma [3].

- The respiratory system can be affected because of forward curvature of thoracic spine and involvement of the costovertebral, sternoclavicular and costochondral joints thereby limiting expansion of thorax[2,4].

So, there is :
- Reduced vital capacity
- Reduced functional residual capacity
- Restricted chest expansion
- Diaphragmatic ventilation due to stiff ribs
- Restrictive lung defect on pulmonary function tests[3,2]

Upper lobe fibrosis mimicking tuberculosis.

In case of major surgery, limited chest expansion and decreased lung capacity may warrant postoperative mechanical ventilatory support. Chest X-Ray and Pulmonary function test should be done[4,2].

- Cardiovascular involvement may cause[2,5] :
  - Aortic regurgitation,
  - Conduction defects,
  - Mitral valve may be affected.

Because of the rigid and fixed thoracic cage, it might be difficult to perform external cardiac massage[19].

Cardiological examination along with ECG and Echocardiogram should be done.

- These patients frequently have massive epidural haemorrhages as a result of spinal fractures[3]. Neurological involvement may result in[5] :
  - Spinal cord compression
  - Cauda equina syndrome
  - Focal epilepsy
  - Vertebrobasilar insufficiency
  - Peripheral nerve lesions.

- Care during positioning of these patients is essential due to risk of spinal fractures and cervical spine instability. This is needed both in the intraoperative and postoperative period to avoid iatrogenic spinal injury and adequate ventilatory support[2].

- Pregnant patients with AS can have normal vaginal delivery. But manifestations of AS along with the physiological changes associated with pregnancy may affect labour, delivery and administration of general or regional anaesthesia. So, these patients should be evaluated properly during early pregnancy[3,4].

- Post-operative physiotherapy, breathing exercises and early ambulation should be done to decrease respiratory complications [3].
Conclusion:
Providing safe anaesthesia can be challenging to patients with Ankylosing spondylitis. Whether general or regional anaesthesia is administered, proper preoperative evaluation of the airway and intraoperative management is of greatest importance in these patients to avoid perioperative complications. The patient as well as the surgeon and the anaesthetist should be aware of the risks and benefits involved in being subjected to surgery under anaesthesia and all the necessary precautions and preparations should be taken.

References:
Anesthesia in a Patient of Rheumatoid Arthritis

S.S. Routray¹, B.K. Pradhan², R.K. Sarangi³

Introduction

Rheumatoid arthritis (RA) is an autoimmune disorder characterized by acute and chronic systemic inflammation that primarily involves the joints. It may affect many tissues and organs, including blood vessels, heart, skin, lungs, and muscles. RA patients have a reduced life expectancy when compared with the general population. Rheumatic disorders occur with high variability; some are developed very rapidly, others chronically, remain disabled throughout. Anesthetic risks increase as the disease may involve the cardiovascular, respiratory, and renal systems, besides mechanical deformations due to osteoarticular involvement.

PRE-ANESTHETIC ASSESSMENT

The goal of the pre-anesthetic assessment in patients with rheumatoid arthritis is to determine the extent of disease and then to minimize anesthetic and surgical risks. One should be aware of both the consequences of articular and systemic complications of disease and the adverse effects of concurrent drug therapy that may interfere with anesthesia¹,²

RISKS AND DIFFICULTIES SECONDARY TO ARTICULAR DAMAGE

Rheumatoid arthritis is characterized by destruction of synovial joints, affecting mainly the small joints. The temporomandibular joint and spine joints are of particular interest to anesthesiologists. Proliferation and hypertrophy of synovial cells form a layer that destroys articular cartilage, and it can cause ankylosis of the articular space with fibrosis and calcification³.

¹Asst Prof
²Asoc Prof
³PG Student
Dept of Anesthesiology, SCB Medical College, Cuttack

Submitted: 06.08.2012, Accepted: 05.09.2012
© OMJ 2014

These articular changes have an impact on management of anesthesia:

- The presence of deformities may affect patient positioning during surgery, hindering access for regional anesthesia or venous cannulation.
- The difficulty in positioning the patient on the operating table can result in regions of the body without adequate support, requiring additional support during anesthesia.

Head and neck involvement in rheumatoid arthritis can result in difficult airways due to the complexity of executing the necessary maneuvers for tracheal intubation. Therefore, it is essential to try to evaluate the extension of cervical spine, temporomandibular joint, and cricoarytenoid joint involvement before anesthesia².

CERVICAL SPINE

More than 80% have cervical spine involvement and, of these, over 30% may have instability with symptoms of pain related to the affected spinal segment. Acute subluxation may cause spinal cord compression and/or compression of the vertebral arteries leading to quadriplegia or sudden death. One should be careful to limit movements of cervical spine extension and flexion during anesthesia, which might result in difficult conventional direct laryngoscopy².

TEMPOROMANDIBULAR JOINT

Temporomandibular dysfunction frequently produces limitation of mouth opening and render direct laryngoscopy impossible... Fibrosis on upper and lower articualr surfaces can lead to ankylosis These changes are more common in juvenile rheumatoid arthritis (JRA), frequently associated with hypoplastic mandible³. The incidence of upper airways obstruction in supine position is high in patients with temporomandibular arthritis³.

CRICOARYTENOID DYSFUNCTION

Laryngeal involvement can be seen in more than 75% of rheumatoid arthritis patients. Fixation of the cricoarytenoid joint can present itself as a foreign body.
sensation in the oropharynx, dysphagia, dyspnea, hoarseness, stridor, and airways obstruction. Laryngoscopy can reveal a reduction in the movement of cricoarytenoid joint and vocal cords during inspiration. Postoperative monitoring is necessary to detect possible signs of airways obstruction after removal of orotracheal tube.

SYSTEMIC DISEASES OF INTEREST TO ANESTHESIOLOGISTS

Cardiovascular
- Pericardial effusions, pericarditis and cardiac tamponade
- Myocarditis, amyloidosis, and granulomatous disease
- Endocarditis and left ventricular failure
- Peripheral vasculitis and Raynaud's phenomenon
- Increased atherosclerosis and coronary heart disease

Respiratory
- Restrictive defect (fibrosing alveolitis)
- Rheumatoid nodules
- Reduced chest wall compliance (costochondral disease)
- Pleural effusions

Haematological
- Normocytic normochromic anaemia
- Iron deficiency anaemia (peptic ulceration and bleeding)
- Bone marrow depression from drug treatment

Hepatic and renal
- Chronic renal failure from drug treatment (approx 25%)
- Hepatomegaly, splenomegaly
- Increased serum fibrinogen and alpha-1 acid glycoprotein
- Decreased serum albumin

Neurological and ocular
- Peripheral neuropathy
- Autonomic dysfunction
- Kerato-conjunctivitis

Effects of pharmacotherapy
The groups of drugs currently available for the management of RA include those giving symptomatic relief, corticosteroids, disease-modifying anti-rheumatic drugs (DMARDs) and biological agents, including the new anti-cytokine drugs. In more severe cases, patients may be receiving long-term opioid analgesic. Important adverse effects of drug treatment which are relevant to anesthesia are shown in Table 2.

### Table 2
<table>
<thead>
<tr>
<th>Drug therapy in RA</th>
<th>Key adverse effects relevant to anaesthesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs providing symptomatic relief</td>
<td></td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>Hypertension, electrolyte imbalance, diabetes, obesity, peptic ulcer disease, fragile skin, adrenal suppression</td>
</tr>
<tr>
<td>NSAIDs</td>
<td>Heart failure, hypertension, gastric bleeding and ulceration, nephrotoxicity, fluid retention, increased perioperative bleeding</td>
</tr>
<tr>
<td>Disease-modifying anti-arthritis drugs</td>
<td></td>
</tr>
<tr>
<td>Sulphasalazine</td>
<td>Neutropenia, thrombocytopenia, aplastic anaemia, fibrosing alveolitis</td>
</tr>
<tr>
<td>Methotrexate</td>
<td>Pulmonary toxicity, hepatic cirrhosis</td>
</tr>
<tr>
<td>Chloroquine</td>
<td>Retinopathy, neuromyopathy, cardiomyopathy</td>
</tr>
<tr>
<td>Azathioprine</td>
<td>Cholestatic hepatitis, bone marrow suppression</td>
</tr>
<tr>
<td>Cyclosporin</td>
<td>Nephrotoxicity, hypertension, tremor</td>
</tr>
<tr>
<td>Gold</td>
<td>Thrombocytopenia, bone marrow suppression, pulmonary fibrosis, hepatotoxicity, nephrotic syndrome, proteinuria</td>
</tr>
<tr>
<td>Penicillamine</td>
<td>Bone marrow suppression, haemolytic anaemia, nephrotic syndrome, myasthenia-like syndrome</td>
</tr>
</tbody>
</table>

### Anti-cytokine agents (Biological agents)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Key adverse effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Etanercept (binds TNF)</td>
<td>Flu-like symptoms, blood disorders, demyelinating disorder of the CNS</td>
</tr>
<tr>
<td>Infliximab (anti-TNF)</td>
<td>Associated with development of TB at extrapulmonary sites, chest and abdominal pain</td>
</tr>
<tr>
<td>Adalimumab (anti-TNF)</td>
<td>Flu-like symptoms, abdominal pain, cough, light-headedness</td>
</tr>
</tbody>
</table>

### PREOPERATIVE INVESTIGATION

It will depend on the nature and degree of the involved organ impairment. Table 1 shows guidelines for investigation.

### Table 1 - Pre-anesthetic Assessment

#### EXAMINATION

<table>
<thead>
<tr>
<th>In all cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete blood count</td>
</tr>
<tr>
<td>Drug-induced dyscrasia</td>
</tr>
<tr>
<td>Electrolytes and BUN</td>
</tr>
<tr>
<td>Electrocardiogram</td>
</tr>
</tbody>
</table>
Chest X-ray Pulmonary fibrosis, kyphoscoliosis, heart area
Cervical spine X-ray Flexion deformities, vertical or horizontal translocation. Instability
Whenever indicated Pulmonary function tests Involvement of the pulmonary wall or restrictive disease
Liver function tests Low albumin - drug toxicity
Direct laryngoscopy Symptoms of joint involvement Cricoarytenoid
Echocardiography Valvular heart disease Pericarditis

Regional or local anaesthesia

It is always better to perform surgery under regional or even peripheral nerve blockade. Upper limb surgery may be performed under brachial plexus block and lower limb surgery performed under spinal, epidural block. Regional or local anaesthesia have the advantages of avoiding both neck and airway manipulation and thereby the systemic effects of drugs used for general anaesthesia are also avoided.

Peripheral nerve blocks can be technically challenging because of loss of anatomical landmarks from contractures and flexion deformities. Similarly, spinal and epidural anaesthesia may be technically difficult in cases where the lumbar and thoracic spines are involved in the disease process.

Managing the airway

If general anesthesia is to be performed, the airway can be managed in several ways. The Guedel airway and a face mask may be sufficient in mask ventilation. The laryngeal mask airway (LMA) may also be used. It may be difficult to insert an LMA if the angle between the oral and pharyngeal axis at the back of the tongue is less than 90°; a reinforced LMA may be preferable in such circumstances.

If tracheal intubation is indicated, this must be achieved without causing further injury to a potentially unstable cervical spine. Manipulation of the neck from the neutral position can lead to neurological deterioration, quadriplegia and even sudden death and thus should be avoided. The recommended ‘sniffing’ position for laryngoscopy, whereby the head is hyperextended on a flexed neck can result in exacerbation of the anterior atlanto-axial subluxation with resultant neurological injury. Care should be taken during conventional laryngoscopy and neck manipulation in all patients with RA, even without overt cervical spine instability. An intubating LMA (ILMA) may be used to achieve endotracheal intubation with minimal cervical spine movement.

Fibreoptic intubation has improved the safety of airway management in patients with RA. Where difficult intubation is anticipated because of cervical spine instability, TMJ disease or a reduction in neck movement, an awake fibreoptic intubation is highly recommended. However, an awake fibreoptic intubation is not without problems and depends on the skill of the operator. Tracheostomy can be performed under local anaesthesia and is another method of securing the airway of patients with cricoarytenoid involvement.

Other important factors

Positioning of the patient should be meticulous and all pressure areas padded to avoid pressure sores. Methylcellulose eye drops should be applied as up to 15% of patients with RA suffer from keratoconjunctivitis sicca and are at risk of corneal ulceration. Consideration should be given in positioning the patient awake before induction of general anaesthesia.

Full aseptic technique for establishing i.v. access, epidural/spinal blocks, arterial and CVP-line and urinary catheter is mandatory as these patients may be at increased risk of infections from immunosuppressive drug treatment.

Long-term steroid therapy causes adrenal suppression and patients taking an equivalent dose greater than prednisolone 10 mg daily require steroid cover. Blood glucose concentrations should be monitored closely and controlled with insulin. Patients taking steroids and NSAIDs are at risk of developing gastro-intestinal tract bleeding and should receive gastric acid prophylaxis.
**Postoperative management**

Careful observation of the airway and breathing are required in the immediate postoperative period. Pre-existing glottic stenosis due to bilateral ankylosis of the cricoarytenoid joints may lead to complete airway obstruction following extubation due to airway oedema caused by tracheal intubation. There are multiple case reports highlighting this complication, which may arise several hours postoperatively. This may require reintubation or tracheostomy, and may be fatal

Patients with RA, in general, are considered to be in a hypercoagulable state. Such patients receiving corticosteroids showed a hypercoagulable state compared with patients suffering from osteoarthritis in the peri-operative period. Thromboprophylaxis should be prescribed, as patients with RA tend to have a slower recovery and return to mobilization.

Patients with RA may be at higher risk of peptic ulceration, especially if they are on a combination of steroids and NSAIDs, and appropriate prophylaxis should be considered.

Standard physiotherapy and breathing exercises should be instituted as early as possible due to the increased risk of infection.

Pain should be adequately controlled to avoid delayed mobilisation, venous thromboembolism and chest infections. Opioid analgesia can be used in carefully monitored doses to reduce the incidence of side effects. Patients may find it difficult to use a PCA due to joint deformity and muscle weakness. In these cases, nurse-controlled analgesia or modified devices are possible alternatives.

**References**:

HIV-Associated Rheumatic Diseases

S. Swain

Introduction:

It is prudent to have a brief discussion on viral arthritis, before going to details about HIV-associated Rheumatic diseases. Viral arthritis is defined as swelling and inflammation of the joints from a viral infection. It may be a symptom of many virus-related illnesses. It usually disappears on its own without any lasting effects. Such arthritis are commonly found with viral infections like:

- Enterovirus
- Dengue virus
- Hepatitis B
- Hepatitis C
- Human immunodeficiency virus (HIV)
- Human parvovirus
- Mumps
- Rubella

It may also occur after immunization with the rubella vaccine. This is a common form of childhood joint discomfort. While many people are infected with these viruses or receive the rubella vaccine, only a few people develop arthritis. No risk factors have been established till date.

In viral arthritis the main symptoms are joint pain and swelling of one or more joints. A physical examination shows joint inflammation. A blood test (serology) for viruses may be performed to know the exact viral aetiology. In some cases, a small amount of fluid may be removed from the affected joint to determine the cause of the inflammation.

Out of all viral arthritis, HIV-related arthritis needs special mention because of its specific characteristics with regard to its presentation and management as well as in its involvement with a specific group of population known as People Living with HIV (PLHIV).

HIV-associated arthritis and rheumatic diseases includes:

- Reactive arthritis: A type of arthritis that occurs as a reaction to an infection elsewhere in the body.
- Psoriatic arthritis: One of a group of diseases known as spondyloarthropathies.
- Osteomyelitis: A bone infection usually caused by bacteria.
- Polymyositis: A connective tissue disease characterized by inflammation and degeneration of the muscles.
- Vasculitis: Inflammation of the blood vessels.
- Infected joints: Originates from an infection elsewhere within the body and is carried to the affected joint.
- Fibromyalgia: A condition characterized by body aches, pain, sleep problems, extreme fatigue, depression, anxiety, tender points.

Diagnosing HIV-Associated Rheumatic Diseases:

According to the American College of Rheumatology (ACR), "HIV-associated rheumatic diseases may precede the diagnosis of HIV." If a person is at high risk for the HIV virus and presents symptoms of painful joints, painful muscles, or other rheumatic symptoms, testing for the HIV virus could confirm or rule out the diagnosis of HIV. HIV-associated rheumatic diseases can affect any age group, race, or gender, but most commonly affects people between 20-40 years old.

Treating HIV-Associated Rheumatic Diseases:

Immunosuppressive medications, such as methotrexate and Imuran, are commonly prescribed for the treatment of certain types of arthritis. However, immunosuppressive therapy may be contraindicated for patients with an HIV infection.

HAART (Highly Active Anti-Retroviral Therapy), has been effective in treating rheumatic problems associated with HIV. Patients with HIV-associated rheumatic diseases also benefit from
treatment with pain medications and anti-inflammatory drugs.

**Key Points About HIV and Rheumatic Diseases:**

- Any rheumatic disease can occur without HIV infection.
- 30-70% of HIV infected persons may develop an associated rheumatic disease.
- The presence of an associated rheumatic disease worsens the prognosis of an HIV infection.

About one-third of people with HIV will experience joint pain at some point during the course of their disease. These pains have a number of causes, and some cases are unexplained. Rheumatic diseases account for some of these joint complaints.

Before the introduction of highly active antiretroviral therapy (HAART), many more people with HIV had HIV-associated arthritis. HAART drugs cause an increase in CD4 cells, which are important for the immune status of an individual and these cells are in very low count in advanced HIV. Many of the arthritis and musculoskeletal syndromes seen in advanced HIV infection no longer develop when a patient on HAART has his CD4 counts improved.

But certain types of rheumatic diseases - particularly systemic lupus erythematosus (SLE, or lupus), and rheumatoid arthritis - seem to get better or go into remission when a person develops advanced HIV with low CD4 counts.

**HIV and Rheumatic Disease: A Complicated Relationship**

Rheumatologist Kevin McKown of the University of Wisconsin in Madison says, "The relationship between HIV infection and the risk of rheumatic disease is complicated. There's actually a whole host of rheumatic manifestations that you can get when you have HIV. Always there is chance that one would have developed a rheumatic disease even if he did not has HIV. But McKown adds that people with HIV have a different experience because:

They have more risk factors for rheumatic diseases, such as a weakened immune system and risky behaviors that increase the likelihood of developing a rheumatic disease.

The HIV virus itself can cause symptoms in some people.

Some HIV medications, particularly the older ones, resulted in joint pain as a side effect.

Additionally, McKown notes another difference in the way people with HIV are affected by rheumatic diseases. "There is a feeling that they tend to have more severe symptoms, especially when they get spondyloarthropathies (a class of rheumatic diseases that affect the spine) because of their CD4 cells being knocked out."

**HIV and Rheumatic Disease: Increased Risks**

People with HIV are at increased risk of:

- Reactive arthritis: Reactive arthritis is a rheumatic disease that develops after the body has had an infection. Up to one in 10 HIV patients will have reactive arthritis. Sexually transmitted diseases such as chlamydia are common causes of reactive arthritis; but the HIV virus itself appears to trigger reactive arthritis in infected people. Basically, some elements of the virus finds its way into the joints, where the immune system of the body tries to fight it off - causing the swelling and pain that characterizes arthritis. Both Reiter's syndrome and septic bursitis can cause a monarticular arthritis in an HIV-infected patient.

- Psoriatic arthritis: Psoriatic arthritis can be one of the first signs of HIV in some people. "The most notable HIV-related (rheumatic) disease is psoriatic arthritis," says Hugh McGrath Jr., MD, a clinical professor of rheumatology at the Tulane University School of Medicine in New Orleans. "When anybody shows up now with psoriatic arthritis, we get an HIV test just to make sure. These are people who get bad psoriasis and bad psoriatic arthritis." Researchers are still trying to understand the relationship between psoriatic arthritis and HIV infection. Psoriatic arthritis with or without psoriasis occurs in HIV-infected persons. The prevalence of psoriasisiform skin changes and psoriatic arthritis in HIV-infected persons probably is the same as that in non-HIV infected persons (1 to 2%), but the severity of the HIV-associated psoriasis and psoriatic arthritis tends to be worse.

- HIV- or AIDS-associated musculoskeletal pain and inflammation: Early in the HIV epidemic, patients often had generalized joint pain and swelling. The
number of patients with this experience has gone down with the introduction of HAART. However, people who have not yet received an HIV diagnosis still may visit their doctor complaining of joint and muscle pain and find out about HIV in that way.

Infectious or septic arthritis: People with HIV don't necessarily get this type of arthritis more than their peers, they are just likely to get it in a different way - from direct infection of a joint instead of the spread of infection from another body area. Septic arthritis is more likely to happen in someone with HIV who is also an injection drug user, has hemophilia, or with a CD4 count around 250 or lower.

Gram-positive bacteria, such as S. aureus and Streptococcus pneumoniae, commonly found in non-HIV infected patients with septic arthritis and bursitis, are causative factors in most reported cases of septic arthritis and bursitis in HIV-infected persons(5,6). Infections with organisms not common to the skin have also been reported(7). One report described osteomyelitis in HIV-infected patients, but usually it results from direct extension from a septic joint.(5). Clinicians must frequently re-examine HIV-infected patients treated for septic arthritis for evidence of worsening or unchanging symptoms and signs. If bone pain and fever continue despite antibiotic coverage, extension of the infection to the surrounding bone should be considered; surgical debridement may be necessary.

In most HIV-infected patients with acute joint or bursa infections, broad antibacterial coverage to cover common skin organisms (including staphylococcal and streptococcal infections) should be initiated. Patients with advanced HIV disease occasionally have opportunistic joint infections, such as sporotrichosis, cryptococcosis(7), and Mycobacterium avium intracellulare(8,9). Often these patients have extra-articular features suggestive of such infections, including typical skin lesions. These opportunistic infections often present with a more indolent course than that of a bacterial septic arthritis. If extra-articular features of fungal infection are present or hyphae or budding yeasts are seen on direct synovial fluid examination, the patient should receive standard doses of intravenous amphotericin B.

HIV and Rheumatic Disease : Reduced Risk

Interestingly, people with HIV are actually at reduced risk of developing two of the more common rheumatic diseases:- lupus (systemic lupus erythematosus) and rheumatoid arthritis. However, treatment with HAART may cause rheumatoid arthritis to re-emerge in HIV-infected populations. In those situations, the rheumatic disease may actually get worse when a person infected with HIV is administered HAART.

Reiter's Syndrome:

Reiter's syndrome, the first rheumatic syndrome reported in patients with HIV infection,(10), can be a severe illness in HIV-infected patients, but whether it occurs more frequently in HIV-infected patients than in the general population is controversial. One report(5) described nine patients with Reiter's syndrome and AIDS-related complex and subsequent reports described additional patients.(11). The syndrome occurs in asymptomatic HIV-infected persons and in those with mild to severe immunodeficient states. Generally, the arthritis remains active and may increase in severity as HIV disease progresses.

The clinical manifestations of Reiter's syndrome either occur along with or, most commonly, follow the onset of clinically apparent immunodeficiency. In those patients in whom Reiter's syndrome precedes clinical evidence of immunodeficiency, a period of up to 2 years may elapse before HIV infection becomes clinically apparent.(12,13)

Clinical Manifestations

The classic triad of arthritis, urethritis, and conjunctivitis occurs in some HIV-infected patients with Reiter's syndrome; more often, however, an incomplete form of Reiter's occurs.(14,15,16) A common symptom is oligoarthritis of the large weight-bearing joints (usually the ankles or knees). Other common extra-articular manifestations include balanitis circinata, keratoderma blennorrhagicum, stomatitis, and uveitis. Enthesopathy, a disorder of the muscular or tendinous attachment to the bone, is a relatively common cause of disability and may involve the Achilles tendon, plantar fascia, anterior and posterior tibial tendons, and tendons of the feet.

Pathogenesis

The pathogenesis of HIV-related Reiter's syndrome is complex and includes the following factors:
decreased CD4+ lymphocytes, increased CD8+ cytotoxic lymphocytes, induction by infectious agents, association with the class I allele HLA-B27, and direct and indirect consequences of HIV infection. There is no consensus on the role of HIV infection and Reiter's syndrome at this time. Further research on the interrelationship of the two diseases may elucidate the immunologic triggers that manifest Reiter's syndrome in an HIV-infected host.

**Conclusion:**

Rheumatic diseases in HIV infected persons need special care for a quality life. In this era of HAART no person infected with HIV & suffering from arthritis of any aetiology must not be neglected to be diagnosed early and to be provided with prompt and appropriate medical care to lead a quality life.

**References**

Abstract:

MRI is highly effective in characterizing congenital spinal cord lesions. We did a prospective observational study on 50 patients using 1.5 T MRI machine. Results were tabulated and compared to similar previous studies. Our study showed spinal dysraphisms being common on females & lumbo-sacral region. Spinal cord anomalies were associated with spinal curvature & vertebral anomalies and VACTERL, Urogenital / Anorectal anomalies/Arnold-Chiari syndrome.

Introduction:

A wide range of congenital and developmental disorders of spine arise due to the defects of the neural tube.

The incidence of spinal dysraphism is 1-2 cases per 1000 live births. Open neural tube defect (ONTD) is the most common birth defect. The incidence of NTDs is also relatively high in Indian and Eastern Mediterranean populations.

Spinal dysraphisms affect multiple parts including the brain, the bony spine, the extremities, and bowel and bladder function.

Aims & objectives:

Evaluating the role of magnetic resonance imaging (MRI) in characterization of congenital and developmental disorders of spine.

Mr Imaging:

Saggital- Midline T1/T2 imaging is the best MR Sequence for characterization of cord & Placode. Short TR/TE pulse sequences with coronal Multislice acquisition provide the most efficient way to obtain optimal demonstration of Conus morphology. Increasing the field strength from 0.5 T to 1.5 T allows a significant reduction in the imaging time & improving image quality. MR Myelography is heavily T2 weighted sequence demonstrating CSF with higher resolution.

Careful application of an abdominal compression band has significantly reduced respiratory and bowel-motion artifacts, particularly in infants.

Iskandar et al reported a significant difference in the incidence of identifying intraspinal anomalies in occult spinal dysraphism between the techniques of Myelography and MRI. MR was equal or superior to CT Myelography in evaluating cord swelling, cord atrophy, and cord compression. MRI has advantage of evaluation of foramen Magnum, Posterior fossa, Syringohydromyelia, etc.

Study Design:

Observational study.

Source of Data:

Data is collected from patients clinically suspected and advised to undergo MRI spine at S.C.B. Medical College, Cuttack, over a period from September 2010 to September 2012.

SAMPLE SIZE: All the clinically suspected cases advised to undertake MRI spine at S.C.B. Medical College, Cuttack over a period from September 2010 to September 2012, with a minimum target of 30 patients.

Duration: September 2010 to September 2012.

Inclusion Criteria:

1. All clinically suspected cases who are advised MRI.

Exclusion Criteria:

1. All post operative cases.
2. Claustrophobic patients.
3. Patients on pace maker and metallic implants.
Method of Statistical Analysis:

Study will be conducted over a period of September 2010 to September 2012 using 1.5T MRI (GE-SIGNA HDX MACHINE).

After acquisition Images will be stored in a compact disk. Data analysis will be done using rates, ratios and percentages of different diagnosis and outcomes made by MRI spine, which will be computed and compiled.

Patients with spinal anomalies undergo screening MRI brain to rule out associated congenital anomalies. (fig.1)

Fig.1 Lumbar Myelomeningocele (block arrow) with Aqueductal Stenosis.

Observations & Results:

In the present study, there is female predominance, female to male ratio being 26:24. The peak occurrence of congenital spinal lesions is seen in age group 0-20 yrs (70%) and more common in female than males (26:24).

Congenital spinal lesion without subcutaneous mass is commonest observation, seen in 62% of patients.

Distribution of congenital spinal lesions is commonest in lumbar region, seen in 54% of patients with cervical region being rarest 6%.

Congenital spinal lesion without curvature abnormality is more common than with curvature abnormality, seen in 58% of cases. In the present study, the peak occurrence of spinal curvature abnormalities is seen in adolescents (>10yrs), with 57.14%.

Spina bifida is commonest vertebral anomaly and sacral agenesis is rare vertebral anomaly in patients with congenital spinal lesions.

Vertebral anomalies are the commonest observation seen in 78% of cases, followed by Spina bifida (46%), Tethered cord (44%), Scoliosis/kyphosis (42%), Syrinx (40%) and Diastematomyelia (24%).

The peak occurrence of Diastematomyelia is seen in age group of 0-10 years with 41.66% with a M:F ratio 7:5.

Spina bifida is commonly associated with tethered cord (68.18%) followed by Syrinx (54.54%), Diastematomyelia (36.36%) and Thick filum terminale (18.18%).

In the present study, Cutaneous stigmata (24%) is the most commonly observed other associated congenital anomaly with spinal dysraphism, VACTERL 4%, Arnold-Chiari 12%, Urogenital 12%/Ano-rectal 10% Malformations also commonly seen.

Discussion:

Spinal dysraphism is believed to be more common in females than in males. The study by De Wals P et al2 have shown that, about 55-70% of neural tube defects occur in females. This female predominance was seen in both still and live births 49. In present study also, female predominance is noted and female to male ratio was seen to be 26:24.

Spinal dysraphism is seen more common in younger age group. In present study, the peak occurrence of the spinal dysraphism is seen in the age group: 0-20 years with 70%.

The overlying skin in spinal dysraphism contains various cutaneous lesions such as hairy nevus, dimples, capillary hemangioma, tails, and subcutaneous masses. In a retrospective study by Guggisberg et al3, Open spinal dysraphisms were found in 25.9% of the children with subcutaneous mass.

In another study by Tortori-Donati et al4, CSD was categorised clinically, depending on the presence...
of a subcutaneous mass in the back. CSD with a mass mainly consisted of lipomas with dural defects and meningoceles, and accounted for 18.8 % of CSD. In present study spinal dysraphism with subcutaneous mass accounted for 38 %.

A study conducted by Assaad A et al5 showed that almost all of the spinal dysraphism with subcutaneous mass occur in the lumbosacral spine. In present study, the commonest location was lumbar region with 54 %. Cervical region was rarely involved accounting for 6 %.

In a study by McMaster6 20% of patients with congenital scoliosis, spinal cord developmental defects were observed, including tethered cord, Diastematomyelia, or Intradural lipoma.

In the present study 42 % of the spinal dysraphism had spinal curvature abnormality. The peak occurrence of the spinal curvature abnormalities is in adolescent type with 57.14 %, followed by 28.58 % in juvenile type & 14.28 % in infantile type.

In the present study, Spina bifida is the commonest (46%), followed by block vertebra (24%), Hemivertebra (22%), Butterfly vertebra (18%), Posterior element dysraphism (10%) and sacral agenesis (2%), Tethered cord (44%), Scoliosis/kyphosis (42%), Syrinx (40%) and Diastematomyelia (24%).

In a retrospective study by Y.C.Gan et al7, in 17 children with Diastematomyelia, mean age at diagnosis was 3.4 years (range 5 days-12 years). In the present study, the peak occurrence of Diastematomyelia is seen in 0-10 age group with 41.66%.

Fig.4 Diastematomyelia- Fibrous Septa (Arrow) Splitting Two Hemicords

In the same study, out of 17 children there were nine girls and eight boys. In the present study, there is female predominance (58.33%) in the patients with Diastematomyelia, female to male ratio being 7:5.

In a study by Rajpal et al8 the most common intra operative findings were LMMC (41%) and tight Filum terminale (36%).

In the present study, Spina bifida and tethered cord is commonly associated with Syringohydromyelia with 55% each, followed by Diastematomyelia-45%, abnormal spinal curvature-40%, Arnold-Chiari malformation-25%, Thick Filum Terminale & MMC-15%, Lipoma & Filar Lipoma-10% and DDS, MC& LMMC-5%.

A combination of 2 or more congenital midline skin lesions constitutes the strongest marker of OSD.

In a study by B A Appignani et al9 The prevalence of dysraphic myelodysplasia in each group of children was 17% (1/6) for low imperforate anus (ectopic anus), 34% (11/32) for high imperforate anus64. Another study by Botto LD et al10Prevalence of spinal dysraphism in VATER syndrome is around 10%, correlating with our study.

Conclusion:

From the present study it was noted that, magnetic resonance imaging (MRI) is an accurate &
non-invasive modality for characterizing & diagnosing these disorders of spine & for pre op planning.

**Abbreviations:**
- T - Tesla
- T1 - Longitudinal relaxation time
- T2 - Transverse relaxation time
- TE - Echo time
- TR - Relaxation time
- DDS - Dorsal dermal sinus
- LMMC - Lipomyelomeningocele
- MC - Meningocele
- MMC - Myelomeningocele
- OSD - open spinal dysraphism
- VACTERL- vertebral, ano-rectal, cardiac, tracheo-oesophageal, renal, limb anomalies.
- MDCT - Multi detector Computed tomography
- MRI - Magnetic resonance imaging

**Bibliography:**


---

**Members are requested to enroll more colleagues as members of IMA and join AMS and CGP in large nos for formation of local branches and extra academic activities.**
A Comparative Study Between Saline Infusion Sonography Vs Conventional Ultrasound in The Evaluation of Endometrial Pathology

B. Mishra¹, M. Sahu²

Abstract:
Aim/Introduction - The purpose of this study is to evaluate the role of saline solution infusion sonohysterography as a screening and diagnostic procedure in clinical practice for patients with abnormal uterine bleeding. In this series, a prospective study has been conducted comparing two-dimensional transvaginal imaging, saline solution infusion sonohysterography, and endometrial biopsies with surgical histopathology.

Material & methods:
The surgical histopathology has been considered as the gold standard for diagnosis of endometrial pathology. 150 cases of abnormal uterine bleeding were selected for this study. Endometrial pathology of all these cases were studied by TVS, SIS and by D&C. of the 150 cases, 100 underwent hysterectomy and the rest were advised appropriate medical treatment. The TVS, SIS and D&C findings of these 100 cases were correlated with the histopathology of the hysterectomized specimen. The transvaginal sonography findings, the saline infusion sonohysterography findings and the D&C findings have been compared by sensitivity and specificity with the surgical histopathology findings.

Result:
From our study we conclude that saline infusion sonohysterography is a better investigating modality than transvaginal ultrasonography and has an sensitivity and specificity 92.6% and 96.6% compared to 87.5% and 90% in TVS and 87.5% and 48.3% in D&C respectively. It showed its important role as a screening and diagnostic procedure in evaluating endometrial pathology in the pre& perimenopausal age group.

Conclusion:
In a poor resource country like India saline infusion ultrasonography is a safe, readily available modality for non-invasively imaging the endometrial cavity. Saline infusion sonohysterography offers a study that can more clearly visualize the endometrium and may potentially eliminate the need for other studies such as hysteroscopy. In the evaluation process, saline infusion sonohysterography may be complementary to D&C and endometrial biopsy but can be done as the initial diagnostic procedure in the premenopausal age group.

Introduction:
Abnormal uterine bleeding is the most common gynaecological complaint and occurs across the entire age spectrum. Use of ultrasonography has been shown by several investigators to aid in the diagnosis of abnormal uterine bleeding through the evaluation of endometrium. To evaluate the endometrium more adequately, saline solution infusion sonohysterography was described by Parsons and Lenz JJ in 1993 using the endovaginal probe. Sonohysterography gives even greater detail because there is liquid contrast between the endometrial surfaces. We can distinguish polyps, submucous myomas, fibroids and endometrial hyperplasia in patients with abnormal uterine bleeding with the help of SIS. Fluid instillation into the endometrial cavity is a procedure rarely associated with infections and complications. It is minimally painful, requiring no analgesia, while enhancing the ability to make a diagnosis in patients with abnormal uterine bleeding. The outstanding advantage is that it is a non-invasive procedure.

Materials And Methods:
The prospective study on "Saline infusion sonography vs conventional ultrasound in evaluation of endometrial pathology" was carried out in the...
Department of Obstetrics and Gynaecology, SCB Medical College & Hospital, Cuttack from Sept 2010 to Sept 2012. 150 cases of abnormal uterine bleeding were selected for this study. Endometrial pathology of all these cases were studied by TVS, SIS and by D & C. of the 150 cases, 100 underwent hysterectomy and the rest were advised appropriate medical treatment. The TVS, SIS and D & C findings of these 100 cases were correlated with the histopathology of the hysterectomized specimen. The surgical histopathology has been considered as the gold standard for diagnosis. The transvaginal sonography findings, the saline infusion sonohysterography findings and the D & C findings have been compared with the surgical histopathology findings.

**Selection criteria**
- Age more than 35 years.
- History of abnormal uterine bleeding like menorrhagia, metrorrhagia, postmenopausal bleeding, polymenorrhoea and oligomenorrhoea.
- No detectable vaginal and or cervical lesion, no adnexal pathology, bleeding exclusively of uterine origin.
- Uterus upto 8 - 10 weeks size.

**Exclusion criteria**
- Patients on hormone replacement therapy.
- Uterus size > 10 weeks.
- Patients with pregnancy related bleeding and patients receiving oral contraceptives having breakthrough bleeding were excluded from the study.

All patients were evaluated with an abdominal transducer to measure the uterus and evaluate any potential pathologic conditions outside the focal length of the vaginal transducer. The patients were then asked to empty their bladder and transvaginal ultrasonography was performed with patients in dorsal position. The uterus was scanned longitudinally and transversely, the endometrial thickness was measured at the thickest part in the longitudinal plane by means of electronic caliper built in the ultrasonographic machine. Submucous fibroids and polyps appeared as focal areas of thickened endometrium. The intramural myomas were seen as hypoechoic or echogenic masses within the myometrium. Normal endometrium measuring 5 - 8 mm was seen in many cases.

Next, a speculum was placed in the vagina. A sterile preparation of the cervix was done with povidone iodine. A 6F or 8F pediatric foley's catheter was inserted through the cervical os into the uterus. Next, a small amount of saline (1.5cc - 3 cc) was injected to inflate the foley's balloon to secure the catheter into position in the cervical canal. The speculum was removed and the vaginal probe was reinserted posterior to the catheter. Under direct ultrasonographic visualization and with use of a 20 ml. Syringe, sterile saline solution 3 to 5 ml was injected to distend the endometrial cavity until the endometrial cavity was clearly seen. The contours of the endometrial cavity were evaluated from os to fundus and from tubal ostia to tubal ostia in the longitudinal and transverse planes. The anterior and posterior endometrial thickness was measured in the longitudinal plane. If polyps or submucous myomas were present, the location was noted and the lesions were measured. The intramural myoma were better defined and could be seen as echogenic masses distorting the endometrial cavity and originating in the myometrium with varying depths penetrating into the myometrium. The polyps were also better outline and were seen as echogenic masses contained within the endometrial cavity and surrounded by fluid with a narrow or board base. Following the ultrasonographic investigations, all the patients were subjected to endometrial biopsy in, the secretory phase of the cycle. Multiple strips of endometrium was obtained in all cases and sent to histopathological examination.

Following these investigation, of the 150 cases, 100 were selected for hysterectomy after appropriate pre operative preparation and the rest were given medical treatment. The surgical specimens were preserved in 10% formalin saline and sent for histopathological examination and reports were collected.
COMPARATIVE ANALYSIS OF TVS WITH SURGICAL HISTOPATHOLOGY STUDY

<table>
<thead>
<tr>
<th>Observation</th>
<th>Surgical HP Study</th>
<th>TVS</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal endometrium</td>
<td>40</td>
<td>41</td>
<td>87.3%</td>
<td>90%</td>
<td>85%</td>
<td>91.5%</td>
</tr>
<tr>
<td>Sub mucous myoma</td>
<td>3</td>
<td>5</td>
<td>66%</td>
<td>96%</td>
<td>40%</td>
<td>98.9%</td>
</tr>
<tr>
<td>Intramural myoma &amp; adenomyosis</td>
<td>23</td>
<td>22</td>
<td>91.3%</td>
<td>98.7%</td>
<td>95.4%</td>
<td>97.4%</td>
</tr>
<tr>
<td>Endometrial Polyp</td>
<td>15</td>
<td>12</td>
<td>40%</td>
<td>92.9%</td>
<td>5%</td>
<td>89.7%</td>
</tr>
<tr>
<td>Endometrial Hyperplasia</td>
<td>10</td>
<td>12</td>
<td>70%</td>
<td>94.4%</td>
<td>58.3%</td>
<td>96.5%</td>
</tr>
<tr>
<td>Atrophic Endometrium</td>
<td>9</td>
<td>8</td>
<td>25%</td>
<td>93.4%</td>
<td>22.2%</td>
<td>92.3%</td>
</tr>
</tbody>
</table>

In comparison to surgical histopathology, TVS has 96% specificity and 98.9% negative predictive value for detection of submucous myoma and nearly equal value for endometrial polyp, endometrial hyperplasia & atrophic endometrium but sensitivity and positive predictive value is less.

COMPARATIVE ANALYSIS OF SIS WITH SURGICAL HISTOPATHOLOGY

<table>
<thead>
<tr>
<th>Observation</th>
<th>Surgical HP Study</th>
<th>SIS</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal endometrium</td>
<td>40</td>
<td>39</td>
<td>92.5%</td>
<td>96.6%</td>
<td>94.8%</td>
<td>95%</td>
</tr>
<tr>
<td>Sub mucous myoma</td>
<td>3</td>
<td>4</td>
<td>66%</td>
<td>97%</td>
<td>50%</td>
<td>98.9%</td>
</tr>
<tr>
<td>Intramural myoma &amp; adenomyosis</td>
<td>23</td>
<td>23</td>
<td>95.6%</td>
<td>98.7%</td>
<td>95.6%</td>
<td>98.7%</td>
</tr>
<tr>
<td>Endometrial Polyp</td>
<td>15</td>
<td>13</td>
<td>60%</td>
<td>95%</td>
<td>69%</td>
<td>93%</td>
</tr>
<tr>
<td>Endometrial Hyperplasia</td>
<td>10</td>
<td>11</td>
<td>70%</td>
<td>95.8%</td>
<td>63.6%</td>
<td>96%</td>
</tr>
<tr>
<td>Atrophic Endometrium</td>
<td>9</td>
<td>10</td>
<td>44%</td>
<td>93%</td>
<td>40%</td>
<td>94.4%</td>
</tr>
</tbody>
</table>

In comparison to surgical histopathology, SIS has 95.6% sensitivity for detection of intramural myoma & adenomyosis nearly 96% specificity, and negative predictive value for detection of submucous myoma, endometrial polyp endometrial hyperplasia, atrophic endometrium.

But it is less sensitive and has less positive predictive value for these. However it has more sensitivity and positive predictive value compared to TVS in detecting the endometrial (submucous myoma, polyp) and also intramural pathology.

COMPARATIVE ANALYSIS OF D & C WITH SURGICAL HISTOPATHOLOGY

<table>
<thead>
<tr>
<th>Observation</th>
<th>Surgical HP Study</th>
<th>D &amp; C</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Endometrium</td>
<td>40</td>
<td>66</td>
<td>87.5%</td>
<td>48.3%</td>
<td>58.3%</td>
<td>85%</td>
</tr>
<tr>
<td>Sub mucous Myoma</td>
<td>3</td>
<td>2</td>
<td>0%</td>
<td>97%</td>
<td>0%</td>
<td>96.9%</td>
</tr>
<tr>
<td>Endometrial Polyp</td>
<td>15</td>
<td>5</td>
<td>6%</td>
<td>95%</td>
<td>20%</td>
<td>85%</td>
</tr>
<tr>
<td>Endometrial Hyperplasia</td>
<td>10</td>
<td>12</td>
<td>50%</td>
<td>92%</td>
<td>41.6%</td>
<td>94.3%</td>
</tr>
<tr>
<td>Atrophic Endometrium</td>
<td>9</td>
<td>15</td>
<td>55%</td>
<td>89%</td>
<td>33%</td>
<td>95.2%</td>
</tr>
</tbody>
</table>

In comparison to surgical histopathology, D&C has nearly 87.5% sensitivity, for detection of normal endometrium, specificity and negative predictive value for detection of submucous myoma, endometrial polyp, endometrial hyperplasia is around 96% But it can't detect intramural myoma & adenomyosis.

Transvaginal sonography showed majority of cases to have normal endometrium comparing with surgical histopathology. Though it could detect all cases of endometrial hyperplasia and atrophic endometrium, it missed endometrial polyp in 33% of cases.

On subjecting patients to saline infusion sonohysterography, submucous myoma and endometrial polyps were better visualized. Percentage of missing endometrial polyps and submucous myoma was reduced.

After D & C to know endometrial pathology, hysterectomy was done in 66% of patients, rest were managed with medical therapy. Though D & C could identify normal endometrium with fair degree of accuracy, it could not diagnose intramural myoma and missed a significant percentage of submucous myoma. By comparing all three diagnostic modalities, SIS found to have more sensitive and specific than others. In 87.5% of the total cases who underwent hysterectomy, transvaginal sonography could accurately detected the presence or absence of endometrial abnormalities.

On subjecting the patients to saline infusion sonography, submucous myomas and endometrial polyp were better delineated. This investigative procedure
could accurately diagnose presence or absence of endometrial abnormalities in 92.5% of the total cases who underwent hysterectomy.

**Conclusion:**

In the present study we have compared the three investigative procedures of transvaginal sonography, saline infusion sonography and D & C with surgical histopathology of the hysterectomy specimen in the work up of patients > 35 yrs, complaining of abnormal uterine bleeding to detect any endometrial pathology if any.

Previously, curettage was the gold standard. But the technique can miss endometrial lesions and cannot diagnose associated organic pathology. Undirected sampling, whether through curettage or various types of suction aspiration, will often be fraught with error, especially in cases in which the abnormality is not global but focal (Polyps, focal hyperplasia, or carcinoma involving small areas of the uterine cavity). Saline infusion sonography offers a study that can more clearly visualize the endometrium and may potentially eliminate the need for other studies such as hysteroscopy. In the evaluation process, saline infusion sonography may be complementary to D & C and endometrial biopsy but can be done as the initial diagnostic procedure in the premenopausal age group. But D & C is mandatory in a women complaining of postmenopausal bleeding even if TVS shows an atrophic endometrium. We may miss the early stages of malignancy if we leave such patients after doing a TVS and SIS.

Thus, from our study we conclude that saline infusion sonography is a better investigating modality than transvaginal ultrasonography and has an important role as a screening and diagnostic procedure in evaluating endometrial pathology in the pre& perimenopausal age group.

**References:**

Association of alcohol and tobacco with gastric carcinoma in West Bengal

A.K. Saha¹, S. Maitra², S.C. Hazra³

Abstracts:

Objectives: The aim of the study is to know the association of alcohol and tobacco intake in the form of smoking and chewing with gastric carcinoma in West Bengal.

Materials and methods: Total 23851 patients (smokers and tobacco chewer 13932, nonsmokers 9919, Alcoholic 9933, Nonalcoholic 13918) were interviewed before endoscopy. Among smokers and tobacco chewers, isolated bidi and cigarette smokers were 3720 and 7973 respectively, whereas wine and liquor intakers 6900 and beer and other beverages intakers 3033. Among 462 gastric cancer cases, smokers were 420 (241 cigarette and 179 bidi smokers) and tobacco chewers 42 respectively. Among alcoholics, wine and liquor intakers were 240 and other beverage intakers’ 53. Then comparison were done: 1. to know the incidence of smokers and nonsmokers, alcoholics and non alcoholics in total number of patients, 2] the influence of smoking and alcohol intake on gastric carcinoma, 3] the number of cigarettes and pegs of alcohol per day on gastric carcinogenesis. Again, comparisons were done to know 1] influence of different types of alcoholic beverages on gastric carcinoma, 2] influence of bidi and cigarettes on gastric carcinoma.

Results: Alcoholics, Bidi smokers and wine and liquor intakers earlier starters of smoking and alcoholic beverages significantly (P<0.0001) suffered from gastric carcinoma. Heavy drinkers and smokers were mostly affected (P<0.0001).

Conclusions: Bidi smokers and wine and liquor drinkers, young heavy smokers and drinkers were mostly affected. So there were strong associations between bidi smoking, wine and liquor intakers and gastric carcinoma in West Bengal.

Key words: Endoscopy, smoking, tobacco chewing, alcohol, gastric carcinoma

Introduction:

Adenocarcinoma of stomach, the second most common cause of cancer death worldwide¹ after lung cancer², is the 2nd and 4th most common cancer in males and females respectively³,⁴. Case fatality ratio of gastric cancer is higher than other malignancies, like, colon, breast and prostate cancers⁵. According to geographic variations, high risk areas include Japan, Korea and China as well as Central and South America, whereas, low incidence areas are Southern Asia, North America and Africa⁶. According to epidemiological observations in gastric cancer tobacco smoking has been identified as a risk factor for stomach cancer⁷. But some studies fail to show tobacco smoking and alcohol intake as risk factors for carcinogenesis⁸,⁹. Risk factors for stomach cancer include high intake of alcohol, tobacco smoking and chewing, high intake of salted, pickled foods¹⁰. The development of gastric cancer seems to be the result of complex interaction between environmental and genetic factors. Among the genetic factors, polymorphism in the inflammatory cytokine genes and xenobiotic metabolic genes seems to play a major role¹¹,¹². Among the environmental risk factors, Helicobacter pylori infection, tobacco smoking, alcohol consumption, low intake fruits and vegetables, high intake of salted and pickled food, lack of refrigeration for foods seem to play a major role. The association between smoking status and gastric cancer has been studied for several years, since first cohort studies conducted by Khan¹³ and Hammond¹⁴. Meta analysis published in 1997 suggested risk of stomach cancer among smokers than in nonsmokers¹⁵.
Our present study was to observe association of dietary factors, drinking of alcohol and tobacco smoking (in the form of bidi and cigarette) and chewing with gastric carcinogenesis and to update with the systemic review of the available epidemiological evidence on the relationship between tobacco smoking, chewing, alcohol drinking, dietary habits and gastric carcinogenesis published till date.

**Materials and methods:**

We started our original and honest study only after getting permission from local ethical committee. This was a five years (2008-2012) cumulative and extensively intense study. A total 23851 patients from different Districts of West Bengal (involving Malda, Murshidabad, Nadia, Howrah, Hoogly, North and South 24parganas, Midnapore, Kolkata) were sent for upper gastrointestinal endoscopy to evaluate different presenting symptoms. The informed written consents were obtained from all patients’ party before interview and performing upper gastrointestinal endoscopy. All the subjects were interviewed by the trained interviewer to collect demographic (age, sex and religion) and “Substance use” (tobacco smoking and chewing, alcohol) data using a structured standard questionnaire.

Under “detail of habits”, following information was ascertained.

‘Smoking history’ included: i) Age at which smoking has been started, ii) Numbers of cigarettes or bidi per day, iii) Type of tobacco smoked (cigarette and bidi) or chewing tobacco leaf.

‘Alcohol intake’ history included: i) age at which drinking had been started, ii) Number of years of drinking, iii) Number of pegs per day, iv) Types of alcohol intake.

Endoscopies were performed using 15% xylocaine as local anesthesia. From the suspected lesion in the stomach mucosa in each patient, at least eight bits of tissues were taken, fixed in 10% formalin at room temperature and was sent for histopathology for confirmation.

**Statistics:**

Analyses were done by chi square test and Probability value was observed to detect the significance of the results. Median values with standard deviations were also used to detect the age at which the alcohol and smoking were started, number of cigarettes or bidi taken by the patients per day.

1. For significance of percentages, Z values (normal deviates) have been calculated. P value indicates the maximum probability for a given level of significance.

2. 95% CI for difference of percentage: 

\[(p_1 - p_2) \pm 1.96 SE (p_1 - p_2), \text{ where } SE (p_1 - p_2) = \left\{ p_1 (1-p_1) \ n_1 + p_2 (1-p_2) \ n_2 \right\}\]

Calculations were done by using Graphic pad software.

**Results:**

Total 23851 patients underwent upper gastrointestinal endoscopy, of which 13932 were smokers and tobacco chewers and 9919 were nonsmokers and non chewers, 9933 were alcoholics and 13918 non alcoholics. Smokers and tobacco chewers were significantly affected than non smokers and chewers (325 vs. 137, \(P <0.0001\)) and alcoholics were mostly affected than non alcoholics (293 vs. 169, \(P <0.0001\)) as shown in table I and II respectively. Smokers were mostly affected than tobacco chewers (420 among 11693 vs. 42 among 2239, \(P <0.0001\)), again bidi smokers mostly affected than cigarette smokers (241 among 7973 vs. 179 among 3720, \(P <0.0001\)), as evidenced from table III and IV respectively. Earlistarter of smoking, chewing and alcohol drinking and heavy smokers and drinkers were significantly affected (\(P <0.0001\)) as evidenced in table V and VI. Again, wine and liquor drinkers were significantly affected than beer and other beverages drinkers (\(P <0.0001\)) respectively, as shown in Table VII. Antral mucosa and incisural mucosa were significantly affected in smokers and nonsmokers respectively (table VIII).

**Table I**

<table>
<thead>
<tr>
<th>Smoking and tobacco chewing</th>
<th>Total patients undergoing endoscopy</th>
<th>Total persons affected</th>
<th>% affected</th>
<th>95% Confidence interval</th>
<th>Chi-square test</th>
<th>(P) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker &amp; tobacco chewer</td>
<td>13932</td>
<td>325</td>
<td>2.332</td>
<td>0.0016, 0.0004</td>
<td>26.123</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Non smoker</td>
<td>9919</td>
<td>137</td>
<td>1.381</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OMJ • Vol.34 • No.1 • 2014

**Table II**

Incidence of gastric carcinoma in smokers and non smokers (n=23851)
### Table II

Incidence of gastric carcinoma in alcoholic and nonalcoholic (n=23851)

<table>
<thead>
<tr>
<th>Alcohol intake</th>
<th>Total no. of patients undergoing endoscopy</th>
<th>Total numbers affected</th>
<th>% affected</th>
<th>95% Confidence interval</th>
<th>Chi-square test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>9933</td>
<td>293</td>
<td>2.941</td>
<td>0.9794, 0.9869</td>
<td>87.281</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Non alcohol</td>
<td>13932</td>
<td>159</td>
<td>1.174</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table III

Relation between isolated smoking and tobacco chewing with gastric carcinoma (n=462):

<table>
<thead>
<tr>
<th>Tobacco chewer</th>
<th>Total pts</th>
<th>Cases</th>
<th>%</th>
<th>95% Confidence interval</th>
<th>Chi-square test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>11693</td>
<td>420</td>
<td>3.591</td>
<td>0.009, 0.025</td>
<td>15.818</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Tobacco chewer</td>
<td>2239</td>
<td>42</td>
<td>1.875</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table IV

Relationship of biri & cigar with gastric carcinoma (smokers =420):

<table>
<thead>
<tr>
<th>Tobacco chewer</th>
<th>Total pts</th>
<th>Cases</th>
<th>%</th>
<th>95% Confidence interval</th>
<th>Chi-square test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarette</td>
<td>7973</td>
<td>241</td>
<td>3.022</td>
<td>-0.025, 0.011</td>
<td>21.104</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Bidi</td>
<td>3320</td>
<td>179</td>
<td>4.111</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table V

Among the smokers (Mean±SD)—13932

<table>
<thead>
<tr>
<th>Criteria of smoking</th>
<th>Subjects not affected (13512)</th>
<th>Subjects affected (420)</th>
<th>95% Confidence interval</th>
<th>t test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at which smoking started</td>
<td>24.26±6.3</td>
<td>12.5±4.9</td>
<td>-5.766, -4.234</td>
<td>12.797</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>No. of cigars/day</td>
<td>18.3±7.1</td>
<td>5.2±5.8</td>
<td>15.403</td>
<td>-0.078, -0.278</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

### Table VI

Among the alcoholic person (9933)—Mean±SD

<table>
<thead>
<tr>
<th>Criteria of alcohol intake</th>
<th>Persons not affected (9640)</th>
<th>Persons affected (285)</th>
<th>95% Confidence interval</th>
<th>t test</th>
<th>t test for equal variances (assumed)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at which alcohol intake started</td>
<td>35±10.4</td>
<td>26.26±6.3</td>
<td>6.0±3.9</td>
<td>6.0±7.5</td>
<td>98.740</td>
<td>18.106</td>
</tr>
<tr>
<td>Number of years of drinking</td>
<td>21.5±8.3</td>
<td>3.0±6.3</td>
<td>-10.27, -3.51</td>
<td>-10.37, -8.23</td>
<td>-18.651</td>
<td>17.003</td>
</tr>
<tr>
<td>Number of pegs per day</td>
<td>3.5±2</td>
<td>5.9±7.6</td>
<td>-3.0±2.20</td>
<td>-3.48, -1.72</td>
<td>-12.852</td>
<td>-5.840</td>
</tr>
</tbody>
</table>

### Table VII

Comparison of Different types of beverages in the affected patients (293 alcoholic)

<table>
<thead>
<tr>
<th>Types of beverages</th>
<th>Exposed patients</th>
<th>Affected patients</th>
<th>95% Confidence interval</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wine &amp; liquor</td>
<td>6900</td>
<td>240</td>
<td>0.010, 0.025</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Other beverages</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Including beer</td>
<td>3033</td>
<td>53</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table VIII

Amongst the affected persons (462) relation of smoking and tobacco chewing with site of gastric carcinoma

<table>
<thead>
<tr>
<th>Type of beverage</th>
<th>Fundus</th>
<th>95% Confidence interval</th>
<th>P value</th>
<th>Body</th>
<th>95% Confidence interval</th>
<th>P value</th>
<th>Incisura</th>
<th>95% Confidence interval</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non alcoholic</td>
<td>0.163</td>
<td>(-0.278, 0.078)</td>
<td></td>
<td>0.028</td>
<td>(-0.078, 0.028)</td>
<td></td>
<td>0.4218</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol</td>
<td>0.278</td>
<td>(-0.028, 0.078)</td>
<td>&lt;0.0001</td>
<td>0.078</td>
<td>(-0.078, 0.028)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NS*= Not significant, S**= Significant

### Discussion:

Gastric cancer, although, one of the most common malignancies worldwide, its pathogenesis and the molecular genetics events responsible for the development of carcinogenesis are poorly understood. The relation between cigarette smoking and gastric cancer is underevaluated. The most recent review on this topic was published by Tredaniel et al in 1997 in which, meta-analysis on 40 studies showed quantitative estimation of the association between gastric cancer risk and tobacco smoking. Here, all the categories of smoking, like, current smoker and non smoker, smoker and non smoker, smoking dose relationship (OR=1.49 for smokers up to 20 cigarettes per day and OR=1.67 for heavier smokers) had been evaluated. It was shown that the risk of gastric cancer always appeared higher in current smokers than in ever smokers, suggesting a decreasing trend in the risk after quitting smoking. Current smokers were found to be at higher risk as compared to non smoker as shown by Phukon et al. A significantly increase in risk was observed with increased smoking in South India. Our study showed Smokers and tobacco chewers were significantly affected than non smokers (P=<0.0001), which was similar to the studies done in South India; study by Gajalakshmi et al and in Mizoram study also revealed the...
increased relative incidence of gastric cancer in tobacco chewer than tobacco smokers which was contradictory to our study, where we found tobacco smokers were significantly affected than tobacco chewers. Laroiya I et al presented in South India that smoking, tobacco chewing and alcohol intake were seen more frequently among cases than controls, though these differences were not significant. Sung et al found a weak association of smoking with gastric cancer on the other hand. Gajalakshmi et al presented in India that smoking, tobacco chewing and alcohol intake were seen more frequently among cases than controls, though these differences were not significant. Sung et al found a weak association of smoking with gastric cancer on the other hand. Gajalakshmi et al demonstrated significant 2 fold lay on the line of gastric cancer among smokers compared to non smokers. But some studies could not detect significant association between cigarette smoking and risk of stomach cancer. One case-control study showed reduced risk (OR=0.52; 95% CI: 0.3-0.89) among current smokers compared to nonsmokers. The study led by E.C. Smith of Memorial Sloan-Kettering Cancer Centre and Colleagues found men and women who had ever used 100 cigarettes in their life time were 1.45 times as likely as non tobacco users to die from gastric cancer after curative resection.

According to Chao et al, consequence of smoking was more pronounced for distal gastric cancer with adjusted ratio of 2.0 (95% CI, 1.1-3.7) and 2.1 (95% CI 1.2-3.6) for past and current smokers respectively. This was similar to our survey, which presented antrum and incisura were significantly affected in smokers and in nonsmokers respectively.

Epidemiological studies carried out in India have shown strong association between bidi smoking and cancers in oral cavity, pharynx, larynx and esophagus. Gajalakshmi et al showed that there was three fold lay on the line of gastric malignant neoplastic disease with bidi smokers as compared to cigarette smokers, which was similar to our study, where there was significant (P=<0.001) correlation between bidi smoker and gastric carcinogenesis. Even though the difference of alcohol in bidi (0.2-0.3g) is less compared to (1.0gram), the risk with bidi smoking is higher than the risk associated with cigarette smoking. This may be attributed to poor combustibility possibly due to low porosity of the negligee (Tendu leaf), which results in higher concentrations of volatile phenols (as neoplasm encouraging agents), tar, carcinogenic hydrocarbons benz (a) anthracene and benz (a) pyrene.

According to literature, Alcohol may be carcinogenic to esophagus and cardia but not to distal part of stomach. According to study conducted in Mumbai, alcohol intake was not a risk factor. In Indian context, due to social stigma attached, it is difficult to measure the amount alcohol intake in an individual. Segi et al noted heavy drinkers suffered from stomach cancer as compared to controls which were not supported by the prospective study conducted by Hirayama. Wynder et al in their studies in Japan and other three countries along with Gajalakshmi et al in India observed no significant differences either in type or quantity of alcohol consumption among cases compared to control. In a case control study from Chennai, South India, alcohol consumption were shown to be significant risk factor. Few other studies have found a weak association. But in our study, Alcohol drinkers were significantly suffered from gastric carcinogenesis than non drinkers.

In Italy, the country of heavy consumption of alcohol in the world, the heavy drinkers of wine and liquor suffered from gastric carcinoma, but no association was observed with beer. Previous studies showed inconsistent results. A positive association of heavy alcohol drinking with gastric carcinoma was observed in a prospective study of men from China (HR=1.46(95% CI 1.05-2.04)) and in men from European prospective investigation into Cancer and Nutrition (EPIC) study (HR=1.65(95% CI 1.06-2-58). Our result demoed that higher alcohol consumption accelerated the risk of gastric cancer. This observation was in agreement with the above studies which found an association between alcohol drinking and the risk of
gastric cancer. Our study showed an increased incidence among greater consumers of wine and liquor than heavy drinkers of other beverages supporting the association between heavy consumption of wine and liquor and gastric carcinoma. This was similar to other studies performed in Mexico, Portugal, but there was no association with spirits. In our study it was observed that the persons who started drinking at earlier ages, used to drink alcohol for more number of years and who used to drink more number of pegs per day were significantly affected by gastric cancer.

To explain the possible role of alcohol in gastric cancer, several mechanisms have been proposed. Ethanol, the principal ingredient of alcohol beverages is carcinogenic, because of the following reasons mentioned sequentially. First, Ethanol induces various reactive oxygen species and oxidative stress, which damage DNA and affect the repair. Second, Chronic and heavy alcohol consumption is known to induce cytochrome 450 2E1 (CYP2E1) in various organs, affecting conversion of procarcinogens (present in alcoholic beverages. Tobacco smoke, diet) into carcinogens. Third, Ethanol acts as a solvent for these carcinogens helps them to enter into cells of the stomach mucosa and produces direct toxic effect. Fourth, In the body, ethanol is converted to acetaldehyde by alcohol dehydrogenase and CTP2E1, which in turn promotes carcinogenesis by causing point mutation, inducing sister-chromatid exchanges, impairing DNA repair, inducing epithelial metaplasia and forming mutagenic adducts with DNA.

Conclusions:

Smokers and alcoholics were mostly affected from gastric cancer than non-smokers and non alcoholics respectively. Again, bidi and wine and liquor were revealed as more important risk factors for development of gastric cancer than cigarette and beer and other beverages respectively. Early beginners of smoking and alcohol, heavy and chronic smokers and drinkers were susceptible from gastric cancer. Smokers were mostly affected from antral cancer.

References:

7. IARC (2004). Tobacco smoke and involuntary smoking, IARC monographson the evaluation of carcinogenic risksto humans, 83.
"MRI Evaluation of Posterior Fossa Tumors with Histopathological Correlation"

Inidira.D¹, J. Mohanty², S. Parida³, B.M. Swain³, K. Parida³, Elengo S⁴

Abstract:

MRI is the imaging modality of choice for imaging posterior fossa pathologies because of high soft tissue contrast & absence of streak artefact which is common in C.T scan. We did a prospective study on 90 patients presenting with signs of posterior fossa tumors. All patients underwent MRI without contrast and with 0.1mmol/kg I.V GAD. Diagnosis was based on imaging characteristics & diagnosed patients followed up till surgery. Histopathology reports were collected and compared to MRI results.

MRI accurately diagnosed 84 cases out of 90. Six cases were wrongly diagnosed. Those included two abscesses, two tuberculoma, one metastasis, one PNET.

Introduction:

A brain tumor is one of the most devastating forms of human illness, especially when occurring in the posterior fossa. Brainstem compression, herniation and death are all risks in tumors which occur in its critical location because of the limited space within the posterior fossa.

Incidence:

Brain tumor is the second most common form of malignancy in children and primary brain tumors rank from 6th to 8th in frequency of all neoplasms in the adult (Tadmor R et al). The annual incidence of primary intracranial neoplasms is estimated to be 12.3 per 1lac population and it is increasing in frequency.

Methodology & Technique:

This prospective study of evaluating posterior fossa tumors by MRI with histo pathological & C.T correlation was performed on 90 patients.

Aims & Objectives:

- To study the demographic profile of patients with posterior fossa neoplasm.
- To assess the distribution, features, localization and extent of posterior fossa neoplasm by MRI.
- To correlate the tissue characterization by MRI with that of histo pathological examination.

Inclusion Criteria:

All age groups of either sex with Infra-Tentorial tumors by CT & clinical diagnosis were included.

Exclusion Criteria:

All cases with infra-Tentorial pathology due to infections, congenital malformations, trauma or CVA,
patients with MRI incompatible devices & claustrophobia were excluded.

All the MRI scans of the brain in this study were performed using GE Signa HDX MR Machine with a 1.5 Tesla field strength magnet. Pre contrast images were taken followed by Post contrast images with intravenous administration of 0.1 mmol/kg of body weight of Gadolinium.

**Statistical Analysis :**

All the data were expressed in percentages.

The findings of the clinical examination, CT if any, and MRI diagnosis and histo pathological study were correlated followed by analysis of the present study by comparing with previous similar studies from various literatures.

**Observation :**

This study comprised of 90 patients. Among 90 patients diagnosed as posterior fossa tumors by clinical examination and imaging, 4 (2 tuberculosis & 1 pyogenic abscess in adults, 1 pyogenic abscess in child) were found to be of infective origin by histo pathological examination. Among total of 86 cases, 52(60%) were males and 34(40%) were females.

Out of 86 patients with posterior fossa tumors, 62 were adults among which 33(53%) were males & 29(47%) were females. 24 were of pediatric age among which 19(79%) were males and 5(21%) were females.

Meningioma, Epidermoid & Dermoid showed female predominance, 2 cases of Craniopharyngioma with one male & one female was observed, rest of the tumors showed male predominance.

Among 86 posterior fossa tumors, extra axial lesions (51%) were more common than intra axial lesions (44%).

In adults extra axial tumors (68%) were more common than intra axial tumors (29%) and tumors extending from adjacent areas constituted 3%.

In pediatric age group intra axial tumors (84%) were more common than extra axial tumors (8%) and tumors extending from adjacent areas constituted 8%.

**Fig.1 T1 & T2 Axial- Foramen Magnum Meningioma**

Three common extra axial lesions in descending order of frequency in adults include acoustic Schwannoma, Epidermoid and Meningioma(FIG.1). Others include Dermoid, Arachnoid cyst, Metastasis.

Only 2 extraaxial lesions were found in children, one acoustic Schwannoma and one Arachnoid cyst.

Three common intra axial lesions in descending order of frequency in adults include Metastasis, Hemangioblastoma and Astrocytoma. Others include Medulloblastoma & Choroid plexus papilloma.

Most common Pediatric posterior fossa lesion was Astrocytoma. Other 2 include Medulloblastoma and Ependymoma.

In adults 3 intraventricular lesions were found- Choroid plexus papiloma (1) & Epidermoid (2).

In children 4 Ependymomas were seen in the 4th ventricle and 3 other lesions (2 Medulloblastomas and 1 Astrocytoma) were seen involving both the ventricle and the adjacent Cerebellar parenchyma.

Majority of lesions (except Meningioma & few Schwannoma which are T1 Iso/ T2 Iso) were hypo intense on T1WI & hyper intense on T2WI. Both the cases of Dermoid showed fat and calcification. The most common intra axial lesion was metastasis in adults and Astrocytoma in pediatric age. 7 /8 patients of metastasis and 1 patient of Hemangioblastoma(FIG.2) had multiple lesions, rest all had single lesion.
MRI wrongly diagnosed 6 lesions as Glioma which was found to be tuberculoma (2), abscess (2), PNET (1) [FIG.3] & metastasis (1) by HPE.

MRI correctly diagnosed lesions in 84 patients and wrongly diagnosed in 6, all those 6 lesions were intra axial. Hence MRI was accurate in diagnosing 93.33% of intra axial lesions.

CT correctly diagnosed 80 cases and wrongly diagnosed 10 cases including 1 extra axial tumor. Hence CT was accurate in diagnosing 88.88% of posterior fossa tumors.

Discussion:

MRI is excellent for morphologic and tissue characterization because of greater anatomic detail, better delineation of relationship of tumor to adjacent structures including vessels and detection of hemorrhage, necrosis, solid or cystic components within the tumor.

This study was undertaken with the objectives of determining the distribution, morphology and tissue character of posterior fossa tumors and to correlate the findings with histo pathological examination. All patients underwent MRI followed by confirmation by HPE (except 7 patients with multiple metastasis and known primaries). Among 90 patients 4 were confirmed to be infective pathology by HPE.

Our study showed a male predominance in posterior fossa tumors with Vestibular Schwanoma being the most common type which correlates with Derald E. Brackmann et al2. Meningioma, Metastasis, Epidermoid & Dermoid showed female predominance in our study.

Many studies including James G. Smirniotopoulos M.D3., reported Meningioma as the second most common tumor followed by Epidermoid. But our study showed Epidermoid as the second common tumor followed by Meningioma.

Three common intra axial lesions in descending order of frequency in adults include metastasis (13%), Hemangioblastoma (8%) and Astrocytoma (5%). Others include Medulloblastoma & Choroid plexus papilloma. This observation correlated well with that of James G. Smirniotopoulos M.D3.

In adults 3 intraventricular lesions were found - Choroid plexus papilloma (1) & Epidermoid (2). One Craniopharyngioma and 1 Chordoma (FIG.4) were extending into posterior fossa from adjacent areas in adults.

Among 86 patients 24 were of pediatric age, intra axial lesions were 20(84%), extra axial lesions 2(8%) and 2(8%) were tumors extending from adjacent
areas. Astrocytoma (38%) was the commonest pediatric posterior fossa tumor followed by Medulloblastoma (29%) and Ependymoma (17%). Schwannoma and 1 Arachnoid cyst were seen extra axially. 1 Pinealoblastoma and 1 Craniopharyngioma were extending from adjacent areas.

In children 4 Ependymomas were seen in the 4th ventricle and 3 other lesions (2 Medulloblastomas and 1 Astrocytoma) were seen involving both the ventricle and the adjacent cerebellar parenchyma correlating with Stiller CA et al, 2004.

Among 86 patients, 7 patients with metastasis and 1 patient with Hemangioblastoma had multiple lesions, rest all had single lesion. HPE was not carried out in 7 patients with metastasis whose primaries where known and the lesions where multiple. The primaries in descending order of frequency were breast (4), lung (2), renal (1), gastric (1) & cervical (1) cancers.

Mladen PRVULOVIC, 20005 - About 20% of all intracranial metastases occurs in the posterior fossa. Multiple lesions are the hallmark, but in the posterior fossa there is a high incidence of solitary lesions (25-50%). The adult patient with Medulloblastoma had desmoplastic type with abnormal leptomeningeal enhancement s/o CSF dissemination. Evidence of leptomeningeal metastatic spread is present in 33% of all cases at the time of diagnosis. One patient had multiple (2) lesions with Endolymphatic sac tumor probably VHL.

**Tumor Mimics** : 4 lesions were diagnosed as tumors by imaging, but found to be tuberculosis (2) and abscess (2) by HPE. They were T1 hypointense, T2 hyperintense with variable enhancement and 1 lesion showing diffusion restriction. MRI diagnosed 3 as LGG & 1 as HGG. Even DWI cannot differentiate these two pathologies at some instances as reported by U.Dorenbeck et al, 20036.

**Mri and Hpe Correlation** : This correlates well with many other studies (C. P. Randell et al, 1983).136 MRI was accurate in tissue characterization of 100% of extra axial tumors. Among intra axial tumors MRI accurately characterized the tissue nature in 93.33% of cases with C.T being only 88% accurate. Other advanced MRI tools like perfusion weighted imaging and MR spectroscopy can be of help to overcome this issue. (Erdogan C et al, 2005 & P.H. Lai et al, 2008).7,8

The MRI patterns of posterior fossa tumors in 90 patients were studied. Tuberculoma and pyogenic abscess mimicked tumors at imaging in 4 patients.

**Conclusion** :
- **MRI is accurate for tissue characterization in 100% of extra axial tumors and 93.33% of intra axial lesions involving the posterior fossa.**
- **Main tumor mimics of posterior fossa are tuberculoma & pyogenic abscess.**
- **Advanced MRI techniques may help in better tissue characterization; hence MRI becomes the mainstay of investigation from the view point of diagnostic & prognostic accuracy and safety.**

**Abbreviations** :
- T - Tesla
- T1 - Longitudinal relaxation time
- T2 - Transverse relaxation time
- TE - Echo time
- TR - Relaxation time
- PET - Positron emission tomography
- SPECT - Single photon emission computed tomography
- CT - Computed tomography
- CSF- Cerebrospinal fluid
- MRI - Magnetic resonance imaging
- HPE- Histopathology.
- VHL- Von Hippel Lindau disease.
- PNET- Primitive Neuroectodermal tumor

**Bibliography** :
2. Derald E. Brackmann, Moises A. Arriaga Chapter 188: Differential Diagnosis of Neoplasms of the Posterior Fossa.


---

The following office bearers of API Odisha State Branch - 2014 were elected at last General Body Meeting at Burla

**Chairman**
Dr. Shantanu Kar, Bhubaneswar

**Imm. Past Chairman**
Dr. Brahmananda Das, Cuttack

**Vice-Chairman**
Dr. Manoj Kumar Mohapatra, Burla

**Honorary Secretary**
Dr. Jayanta K. Panda, Cuttack

**Joint Secretary**
Dr. Pradip Kumar Mohanty, Burla

**Treasurer**
Dr. P.K. Rathor, Cuttack

**CO-OPTED MEMBERS**

Hon. Editor OPJ
Dr. Namita Mohapatra

Joint Editor OPJ
Dr. M.R. Behera

Org. Secy., APICON Odisha-13
Dr. S.K. Mohapatra, Burla

Org. Secy., APICON Odisha-14
Dr. Uma Sankar Mishra, Berhampur

**MEMBER TO GOVERNING BODY**

Cuttack
Dr. R.K. Dalai

Berhampur
Dr. Bijay Kumar Behera

Burla/Sambalpur
Dr. K.N. Padhiary

Bhubaneswar
Dr. Amitav Mohanty

Rourkela
Dr. Sajan Agrawal

Private Practitiner
Dr. N. Garabadu, Cuttack

Public Sector undertaking
Dr. B.D. Sahoo, Talcher
Scoring System for Prediction of Outcome in Severe Falciparum Malaria

R.K. Mohanty¹, S. Shetty¹, D. Tripathy², L.K. Meher²

Abstract:
Introduction:
Mortality of falciparum malaria is related to the presence of severe complications. Very few scoring systems have been developed to predict the mortality in severe falciparum malaria. Some of them are as follows:
1. MSA scoring system
2. The APACHE II scoring system
3. The Clinical Scoring Index:
I have applied the MSA scoring system to the patients of severe malaria admitted to MKCG Medical college, Berhampur to predict prognosis and findout utility of this scoring system in South Odisha.

Aim:
1. To assess the severity of organ dysfunction in malaria.
2. To findout the utility of MSA scoring system for predicting outcome in severe falciparum malaria in South Odisha by comparing with other scoring systems.
3. To assess the prognosis.

Methodology:
The Malaria Score for Adults(MSA) is obtained by the formula as follows:

\[ \text{MSA} = 1(\text{severe anemia}) + 2(\text{ARF}) + 3(\text{respiratory distress}) + 4(\text{cerebral malaria}). \]

MSA ranges from 0 to 10. Sensitivity of this score conducted at IGH, Rourkela was 89.9% and specificity was 70.6% by taking 5 as cut-off value.

Results:
Out of 112 cases of severe falciparum malaria studied, 23 died and 89 survived. Number of death for MSA 0-3 is 1 (4%) out of total 25, 4-6 is 8 (11.8%) out of 68 and 7-10 is 14 (73.7%) out of 19 cases. The score could predict mortality with a sensitivity of 63% and a specificity of 95.6% at a cut-off score of 5.

Conclusion:
MSA score is simple and easy to calculate whereas APACHE II scoring system is cumbersome. It can be administered rapidly and repeatedly to prognosticate the outcome of severe malaria in adults. It can help the treating physician to assess the patient as well as to communicate the relatives of the patient about the prognosis.

Introduction:
The clinical course of severe malaria is variable depending on the presence of one or several complications.

Various existing scoring systems have been applied for predicting outcome in malaria and even independent scoring indices have been devised for the same purpose.

Various scoring systems
1) MSA scoring system
2) APACHE II scoring system
3) MSS scoring system
4) CSI scoring system
5) CAM scoring system.

Mishra et al devised a Malaria Score for Adults5 (MSA) to prognosticate the outcome in severe falciparum malaria. With a cut-off score of 5, the sensitivity and positive predictive value for mortality was 89.9% and 94.1% respectively.

Teano et al proposed a Clinical Scoring Index8 for predicting outcome in cerebral malaria with a possible score of 0-14. With an optimum score of 7, it
could predict mortality with a sensitivity of 92% and specificity of 95%.

Wilairatana et al. in Bangkok, Thailand applied the APACHA II scoring to stratify the prognosis in patients of cerebral malaria. With the cutoff point at a score of 24, the APACHE II score stratified the patients mortality outcome with 95.8 accuracy.

**Aims and Objectives**

- To assess the various factors responsible for mortality in severe falciparum malaria.
- To find out the utility of MSA Score in predicting outcome of severe falciparum malaria in adults in South Odisha by comparing with other scoring systems.
- To assess the prognosis.

**Materials & Methods**

This study was conducted from November 2010 to September 2012 in the department of Medicine, MKCG Medical College, Berhampur, Odisha.

All patients diagnosed to be severe falciparum malaria as per WHO criteria 2006 admitted to medicine ward of MKCG Medical College, Berhampur were taken into the study.

- Malaria diagnosis was confirmed by Thick or thin smear/ Optimal test/ Immunochromatographic test positive for falciparum malaria.
- All patients underwent a thorough clinical examination and were investigated as detailed in the study protocol.
- "Malaria Score for Adults," "Clinical Scoring Index", and "APACHE II Score" was calculated for all cases and compared using standard statistical methods.

**Exclusion Criteria Patients with history of**

- Chronic Obstructive Pulmonary disease
- Chronic kidney disease
- Haemolytic disorders like sickle cell anaemia
- Diabetes Mellitus, viral hepatitis, HIV etc.
- CVA, epilepsy etc.

**Investigation**

**Diagnosis of malaria:** by slide test/ ICT/QBC test

**Hematological Examination**

- Haemoglobin estimation by Sahli’s Method
- Total Leukocyte count
- Differential count
- Total platelet count

**Urine Examination**

- For sugar, albumin, RBC, pus cells, casts

**Biochemical tests**

- Blood sugar estimation
- Liver function test- serum bilirubin (direct, total), SGOT, SGPT, alkaline phosphatase.
- Renal function tests- blood urea, serum creatinine
- Serum electrolytes-serum Na+, K+

**Arterial Blood Gas (ABG) Analysis**

**Malaria Score for Adults (MSA) Score**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Anemia (Hb &lt;5 gm/ dl)</td>
<td>1</td>
</tr>
<tr>
<td>- Acute renal failure (S.Cr&gt;3 mg/ dl)</td>
<td>2</td>
</tr>
<tr>
<td>- Resp. Distress (Req. Ventilatory support)</td>
<td>3</td>
</tr>
<tr>
<td>- Cerebral Malaria</td>
<td>4</td>
</tr>
</tbody>
</table>

**Clinical Scoring Index**

Score

- Level of consciousness - Unarousable 4
- Drowsy+ arousable 2
- Awake 0

- Multiple Convulsion - Present 3
- Absent 0

- Laboured Respiration - Present 3
- Absent 0

- Circulatory Collapse- Present 3
- Absent 0

- Abnormal bleeding Present 1
- Absent 0

**CSI Score = a+b+c+d+e=**
### APACHE II score calculation

<table>
<thead>
<tr>
<th>Score</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectal temperature, °C</td>
<td>41</td>
<td>39.0-40.9</td>
<td>38.5-38.9</td>
<td>38.0-38.4</td>
<td>37.0-37.9</td>
<td>30.0-31.9</td>
<td>29.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean blood pressure, mm Hg</td>
<td>160</td>
<td>130-159</td>
<td>110-129</td>
<td>70-109</td>
<td>50-69</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart rate</td>
<td>180</td>
<td>140-179</td>
<td>110-139</td>
<td>70-109</td>
<td>55-69</td>
<td>40-54</td>
<td>39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>50</td>
<td>35-49</td>
<td>25-34</td>
<td>12-24</td>
<td>10-11</td>
<td>6-9</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arterial pH</td>
<td>7.70</td>
<td>7.60-7.69</td>
<td>7.50-7.59</td>
<td>7.33-7.49</td>
<td>7.25-7.32</td>
<td>7.15-7.24</td>
<td>&lt;7.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxygenation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If Flo₂ &gt;0.5 use (A-a) Do₂</td>
<td>500</td>
<td>350-499</td>
<td>200-349</td>
<td>&lt;200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If Flo₂ &lt;0.5 use Po₂</td>
<td></td>
<td></td>
<td>70</td>
<td>61-70</td>
<td>55-60</td>
<td>&lt;55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serum sodium, meq/L</td>
<td>180</td>
<td>160-179</td>
<td>155-159</td>
<td>150-154</td>
<td>130-149</td>
<td>120-129</td>
<td>111-119</td>
<td>110</td>
<td></td>
</tr>
<tr>
<td>Serum potassium, meq/L</td>
<td>7.0</td>
<td>6.0-6.9</td>
<td>5.5-5.9</td>
<td>3.5-5.4</td>
<td>3.0-3.4</td>
<td>2.5-2.9</td>
<td>&lt;2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serum creatining, mg/dL</td>
<td>3.5</td>
<td>2.0-3.4</td>
<td>1.5-1.9</td>
<td>0.6-1.4</td>
<td>&lt;0.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hematocrit</td>
<td>60</td>
<td>50-59.9</td>
<td>46-49.9</td>
<td>30-45.9</td>
<td>20-29.9</td>
<td>&lt;20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WBC 103/mL</td>
<td>40</td>
<td>20-39.9</td>
<td>15-19.9</td>
<td>3-14.9</td>
<td>1-2.9</td>
<td>&lt;1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b) 15-GLASGOW COMA SCORE E__V__M___

**POINTS ASSIGNED TO AGE AND CHRONIC DISEASE AS PART OF THE APACHE II SCORE**

c) Age, Years

d) Chronic Health (History of Chronic Conditions)

**APACHE II SCORE** = a+b+c+d =
ORISSA MEDICAL JOURNAL

OBSERVATION

A total of 112 cases of severe Falciparum malaria were included in the study. The observations of the study were as follows.

Table-1
AGE DISTRIBUTION

<table>
<thead>
<tr>
<th>Age Group in Years</th>
<th>Total</th>
<th>Survival</th>
<th>Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-25</td>
<td>42(37.5%)</td>
<td>33(37.1%)</td>
<td>9(39.1%)</td>
</tr>
<tr>
<td>26-35</td>
<td>27(24.1%)</td>
<td>23(25.9%)</td>
<td>4(17.4%)</td>
</tr>
<tr>
<td>36-45</td>
<td>18(16.1%)</td>
<td>15(16.8%)</td>
<td>3(13%)</td>
</tr>
<tr>
<td>46-60</td>
<td>22(19.6%)</td>
<td>15(16.8%)</td>
<td>7(30.4%)</td>
</tr>
<tr>
<td>&gt;60</td>
<td>3(2.7%)</td>
<td>3(3.4%)</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>112</td>
<td>89</td>
<td>23</td>
</tr>
</tbody>
</table>

Mean Age ±SD 34.87±14.7 34.63±14.67 35.8±15.1 (NS)

Survival vs Death P-Value= 0.7353

There was no significant difference in the age distribution of the two groups. The mean age of the two groups was also similar.

GENDER DISTRIBUTION

<table>
<thead>
<tr>
<th>Gender</th>
<th>Survival</th>
<th>Death</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>73(82%)</td>
<td>21(91%)</td>
<td>94(84%)</td>
</tr>
<tr>
<td>Female</td>
<td>16(18%)</td>
<td>2(9%)</td>
<td>18(16%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>89</td>
<td>23</td>
<td>112(100%)</td>
</tr>
</tbody>
</table>

Survival vs death P-Value=0.3566

There was no significant difference in the gender distribution between the survival and death groups.
Table 3

ORGAN INVOLVEMENT IN SURVIVAL AND DEATH GROUP

<table>
<thead>
<tr>
<th>Organs involved/ complication</th>
<th>No. of cases</th>
<th>Survival</th>
<th>Death</th>
<th>Case fatality rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebral</td>
<td>83(74.1%)</td>
<td>61(68.5%)</td>
<td>22(95.6%)</td>
<td>26.5</td>
</tr>
<tr>
<td>ARF</td>
<td>74(66.0%)</td>
<td>54(60.7%)</td>
<td>20(86.6%)</td>
<td>27</td>
</tr>
<tr>
<td>Jaundice</td>
<td>71(63.4%)</td>
<td>49(55.1%)</td>
<td>22(95.6%)</td>
<td>31</td>
</tr>
<tr>
<td>ARDS</td>
<td>15(13.4%)</td>
<td>3(3.4%)</td>
<td>12(52.2%)</td>
<td>80</td>
</tr>
<tr>
<td>Shock</td>
<td>17(15.2%)</td>
<td>10(11.2%)</td>
<td>7(43.5%)</td>
<td>29.2</td>
</tr>
<tr>
<td>Bleeding/DIC</td>
<td>11(9.8%)</td>
<td>9(10.1%)</td>
<td>2(8.7%)</td>
<td>18</td>
</tr>
<tr>
<td>Anaemia</td>
<td>5(4.5%)</td>
<td>5(5.6%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Acidosis</td>
<td>1(0.9%)</td>
<td>0</td>
<td>1(4.3%)</td>
<td>100</td>
</tr>
</tbody>
</table>

Cerebral, Renal failure and Jaundice were the most common complication. However, the case fatality rate was highest in those having ARDS and Acidosis.

Table 4

NUMBER OF ORGANS INVOLVED VS DEATH

<table>
<thead>
<tr>
<th>No. of Organs Involved</th>
<th>No. of Cases (%) N=112</th>
<th>No. of Deaths (%) n=23</th>
<th>% of Deaths % = (D/C) x 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>20(17.9%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Two</td>
<td>42(37.5%)</td>
<td>2(8.7%)</td>
<td>4.7</td>
</tr>
<tr>
<td>Three</td>
<td>29(25.9%)</td>
<td>4(17.5%)</td>
<td>13.8</td>
</tr>
<tr>
<td>Four</td>
<td>14(12.5%)</td>
<td>10(43.4%)</td>
<td>71.4</td>
</tr>
<tr>
<td>Five or more</td>
<td>7(6.2%)</td>
<td>7(30.4%)</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>112</td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

More the organs involved highest is the death rate. The death rate rises steeply with the involvement of 4 or more organs and there is cent percent death when 5 or more organs are involved.

NO OF ORGANS INV VS DEATH
DISTRIBUTION OF ORGAN INVOLVEMENT

<table>
<thead>
<tr>
<th>Complications</th>
<th>No. of Organs Involved</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>&gt;5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>D</td>
<td>S</td>
<td>D</td>
<td>S</td>
</tr>
<tr>
<td>Cerebral</td>
<td></td>
<td>11</td>
<td>25</td>
<td>1</td>
<td>21</td>
<td>4</td>
</tr>
<tr>
<td>ARF</td>
<td></td>
<td>8</td>
<td>17</td>
<td>1</td>
<td>24</td>
<td>4</td>
</tr>
<tr>
<td>Jaundice</td>
<td></td>
<td>23</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>ARDS</td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Shock</td>
<td></td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Bleeding/DIC</td>
<td></td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Anaemia</td>
<td></td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acidosis</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Patients with two or three organs involved have mainly a combination of cerebral, renal failure or jaundice with ARDS, shock and DIC as one of the complication only in a few cases.

VITALS IN SURVIVAL AND DEATH GROUPS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>All Cases (Mean ± SD)</th>
<th>Survival (Mean ± SD)</th>
<th>Death (Mean ± SD)</th>
<th>P Value (Survival vs Death)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse (/Min)</td>
<td>100.56±13.8</td>
<td>98.7±12.7</td>
<td>107.6±15.96</td>
<td>0.0192</td>
</tr>
<tr>
<td>Mean BP (in mm of Hg)</td>
<td>85.71±20.35</td>
<td>86.81±19.72</td>
<td>81.48±22.58</td>
<td>0.3088</td>
</tr>
<tr>
<td>Temp. (in °F)</td>
<td>100.37±1.6</td>
<td>100.36±1.56</td>
<td>100.39±1.79</td>
<td>0.9419</td>
</tr>
<tr>
<td>Respiration Rate (/min)</td>
<td>23.39±4.24</td>
<td>22.3±3.46</td>
<td>27.57±4.47</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

The pulse rate differed significantly in the death group than in the survival group. There was no significant difference in the Mean BP and Temperature in the survival and death group. However there is very significant difference in the respiratory rate in the two groups.

HEMATOLOGICAL AND BIOCHEMICAL PROFILE

<table>
<thead>
<tr>
<th>Parameter</th>
<th>All Cases (Mean ± SD)</th>
<th>Survival (Mean ± SD)</th>
<th>Death (Mean ± SD)</th>
<th>P Value (Survival vs Death)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoglobin (gm/dl)</td>
<td>9.86±2.49</td>
<td>10.06±2.6</td>
<td>9.1±1.8</td>
<td>0.0982</td>
</tr>
<tr>
<td>TLC (c/mm)</td>
<td>9637.5±331</td>
<td>9404±308</td>
<td>10539±40</td>
<td>0.1438</td>
</tr>
<tr>
<td>S. urea (mg/dl)</td>
<td>153.2±92.9</td>
<td>140.3±93.0</td>
<td>203.2±72</td>
<td>0.0032</td>
</tr>
<tr>
<td>S. Creatinine (mg/dl)</td>
<td>5.19±4.361</td>
<td>4.8±4.4</td>
<td>6.71±3.84</td>
<td>0.0462</td>
</tr>
<tr>
<td>S.Bilirubin (mg/dl)</td>
<td>9.9±10.8</td>
<td>8.2±10.0</td>
<td>16.96±11.33</td>
<td>0.0002</td>
</tr>
<tr>
<td>SGOT (U/L)</td>
<td>213.4±737</td>
<td>193.4±799</td>
<td>288.2±396</td>
<td>0.4255</td>
</tr>
<tr>
<td>SGPT (U/L)</td>
<td>145±756</td>
<td>155.8±843</td>
<td>108.5±104</td>
<td>0.0412</td>
</tr>
<tr>
<td>ALP (U/L)</td>
<td>161.8±92</td>
<td>149.1±126</td>
<td>296±179.3</td>
<td>0.0010</td>
</tr>
</tbody>
</table>

There is statistically significant difference in the mean Urea, Creatinine, Bilirubin, SGPT and ALP in the survival and Death group.

NUMBER OF ORGANS INVOLVED AND GCS IN SURVIVAL AND DEATH GROUP

<table>
<thead>
<tr>
<th>Parameter</th>
<th>All Cases (Mean ± SD)</th>
<th>Survival (Mean ± SD)</th>
<th>Death (Mean ± SD)</th>
<th>P Value (Survival vs Death)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of organs involved</td>
<td>2.52±1.11</td>
<td>2.11±0.8</td>
<td>3.96±0.9</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>GCS</td>
<td>9.93±3.49</td>
<td>10.58±3.3</td>
<td>7.61±3.1</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

An average of 4 organs were involved in the death group compared to only 2 organs in the survival group which is statistically significant. A case in the Death group had an GCS of about 8 which is significantly lower than in the survival group.
Table-9
DEATH IN RELATION TO MSA SCORE

<table>
<thead>
<tr>
<th>MSA</th>
<th>Survival Group (n=89)</th>
<th>Death Group (n=23)</th>
<th>% of Death D/(S+D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>24(27%)</td>
<td>1(4.3%)</td>
<td>4</td>
</tr>
<tr>
<td>4-6</td>
<td>60(67.4%)</td>
<td>8(34.8%)</td>
<td>11.8</td>
</tr>
<tr>
<td>7-10</td>
<td>5(5.6%)</td>
<td>14(60.9%)</td>
<td>73.7</td>
</tr>
</tbody>
</table>

3 out of every 4 patients die when MSA score is 7 or more.

OUTCOME IN RELATION TO MSA SCORE

<table>
<thead>
<tr>
<th>MSA</th>
<th>Survival Group (n=89)</th>
<th>Death Group (n=23)</th>
<th>% of Death D/(S+D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>24(27%)</td>
<td>1(4.3%)</td>
<td>4</td>
</tr>
<tr>
<td>4-6</td>
<td>60(67.4%)</td>
<td>8(34.8%)</td>
<td>11.8</td>
</tr>
<tr>
<td>7-10</td>
<td>5(5.6%)</td>
<td>14(60.9%)</td>
<td>73.7</td>
</tr>
</tbody>
</table>

Table-10
DEATH IN RELATION TO APACHE II SCORE

<table>
<thead>
<tr>
<th>APACHE II</th>
<th>Survival Group (n=89)</th>
<th>Death Group (n=23)</th>
<th>% of Death D/(S+D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>12(13.5%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6-10</td>
<td>28(31.5%)</td>
<td>1(4.3%)</td>
<td>3.4</td>
</tr>
<tr>
<td>11-15</td>
<td>32(35.9%)</td>
<td>5(21.7%)</td>
<td>13.5</td>
</tr>
<tr>
<td>16-20</td>
<td>13(14.6%)</td>
<td>8(34.8%)</td>
<td>38.1</td>
</tr>
<tr>
<td>21-25</td>
<td>4(4.5%)</td>
<td>6(26.1%)</td>
<td>60</td>
</tr>
<tr>
<td>&gt;25</td>
<td>0</td>
<td>3(13.1%)</td>
<td>100</td>
</tr>
</tbody>
</table>

The death rate rises steeply with an APACHE II score of >15.

Table-11
DEATH IN RELATION TO CSI SCORE

<table>
<thead>
<tr>
<th>CSI</th>
<th>Survival Group (n=89)</th>
<th>Death Group (n=23)</th>
<th>% of Death D/(S+D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>72(80.9%)</td>
<td>4(17.4%)</td>
<td>5.2</td>
</tr>
<tr>
<td>5-9</td>
<td>16(17.98%)</td>
<td>10(43.5%)</td>
<td>38.5</td>
</tr>
<tr>
<td>10-14</td>
<td>1(0.01%)</td>
<td>9(39.1%)</td>
<td>90</td>
</tr>
</tbody>
</table>

The Death rate rises from 38.5% at a CSI Score of 5-9 to about 90% when the score is between 10 to 2.

OUTCOME IN RELATION TO CSI SCORE
Table-12
COMPUTATION OF SENSITIVITY AND SPECIFICITY FOR MSA SCORE

<table>
<thead>
<tr>
<th>Score</th>
<th>Survival</th>
<th>Death</th>
<th>Sensitivity</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;X</td>
<td>a</td>
<td>b</td>
<td>(a/a+c)x 100</td>
<td>(d/b+d)x 100</td>
</tr>
<tr>
<td>≥X</td>
<td>c</td>
<td>d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;4</td>
<td>24</td>
<td>1</td>
<td>27%</td>
<td>95.6%</td>
</tr>
<tr>
<td>≥4</td>
<td>65</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>56</td>
<td>1</td>
<td>63%</td>
<td>95.6%</td>
</tr>
<tr>
<td>≥5</td>
<td>33</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;6</td>
<td>57</td>
<td>1</td>
<td>64%</td>
<td>95.6%</td>
</tr>
<tr>
<td>≥6</td>
<td>32</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;7</td>
<td>84</td>
<td>9</td>
<td>94.4%</td>
<td>61%</td>
</tr>
<tr>
<td>≥7</td>
<td>5</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;8</td>
<td>88</td>
<td>11</td>
<td>98.8%</td>
<td>52%</td>
</tr>
<tr>
<td>≥8</td>
<td>1</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;9</td>
<td>88</td>
<td>11</td>
<td>98.8%</td>
<td>52%</td>
</tr>
<tr>
<td>≥9</td>
<td>1</td>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table-13
COMPUTATION OF SENSITIVITY AND SPECIFICITY FOR APACHE II SCORE

<table>
<thead>
<tr>
<th>Score</th>
<th>Survival</th>
<th>Death</th>
<th>Sensitivity</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;X</td>
<td>a</td>
<td>b</td>
<td>(a/a+c)x 100</td>
<td>(d/b+d)x 100</td>
</tr>
<tr>
<td>≥X</td>
<td>c</td>
<td>d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;13</td>
<td>62</td>
<td>3</td>
<td>69.6%</td>
<td>87%</td>
</tr>
<tr>
<td>≥13</td>
<td>27</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;14</td>
<td>68</td>
<td>4</td>
<td>76.4%</td>
<td>82.6%</td>
</tr>
<tr>
<td>≥14</td>
<td>21</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;15</td>
<td>70</td>
<td>5</td>
<td>78.7</td>
<td>78.3</td>
</tr>
<tr>
<td>≥15</td>
<td>19</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;16</td>
<td>72</td>
<td>6</td>
<td>80.9%</td>
<td>73.9%</td>
</tr>
<tr>
<td>≥16</td>
<td>17</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;17</td>
<td>77</td>
<td>7</td>
<td>86.5%</td>
<td>69.6%</td>
</tr>
<tr>
<td>≥17</td>
<td>12</td>
<td>16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discussion

The present study entitled SCORING SYSTEM FOR PREDICTION OF OUTCOME IN SEVERE FALCIPARUM MALARIA included 112 cases of severe falciparum malaria out of which 23 died and 89 survived.

The mean age of cases in the survival group was 34.63 ± 14.67 years and it was 35.8 ± 15.1 years in the death group (Table No.1). There was no significant difference in the age distribution of cases between survival group and death group. The highest percentage of cases was in the 15-25 year age group both in the survival and death group. Younger people are more commonly affected by malaria probably because of greater exposure to mosquito bite and the acquisition of partial immunity by the older people in the endemic areas. However the death group had a bi-modal distribution with the second peak in the 45-60 year age group.

There was no significant difference in the gender distribution of the cases between the survival and death group. As shown in Table no. 2 the number of male cases in the survival group was 82% and in the death group it was 91%. In 7 Asian countries where genders of malaria cases were recorded, 52-71% of reported cases were male. According to the World malaria report 2005 the higher incidence of malaria in males compared with females probably reflects the occupational exposure in males, although gender differences in treatment-seeking behaviour might also be a contributing factor.

As observed in Table No. 3 cerebral malaria was the most common complication occurring in about three-fourth of all cases and in more than 95% of cases in the death group. The case fatality rate in patients of cerebral malaria was 26.5% i.e. one-fourth of the patients having cerebral malaria died. Although renal failure and Jaundice were present in two-third of all cases, they were present as a complication in most of the cases that died. Only 15% of the cases had ARDS or Shock as one of the complication. However they were present in about 50% of the cases who died. Bleeding/DIC was present as a complication in only 10% of all cases. Only 4.5% of the cases had haemoglobin of less than 5. Acidosis as proved by a pH of <7.25 was present in a single case which died.

There was no death when only one organ was involved. The death rate was less than 15% till three organs were involved but it rose steeply with the involvement of four or more organs. Similarly all the patients died who had five or more complications (Table No.4). This observation shows that any patient with

<table>
<thead>
<tr>
<th>Score</th>
<th>Survival</th>
<th>Death</th>
<th>Sensitivity</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;X</td>
<td>a</td>
<td>b</td>
<td>(a/a+c)x 100</td>
<td>(d/b+d)x 100</td>
</tr>
<tr>
<td>≥X</td>
<td>c</td>
<td>d</td>
<td>55%</td>
<td>87%</td>
</tr>
<tr>
<td>&lt;3</td>
<td>49</td>
<td>3</td>
<td>65.2%</td>
<td>82.6%</td>
</tr>
<tr>
<td>≥3</td>
<td>40</td>
<td>20</td>
<td>81%</td>
<td>82.6%</td>
</tr>
<tr>
<td>&lt;4</td>
<td>58</td>
<td>4</td>
<td>90%</td>
<td>74%</td>
</tr>
<tr>
<td>≥4</td>
<td>31</td>
<td>19</td>
<td>91%</td>
<td>70%</td>
</tr>
<tr>
<td>&lt;5</td>
<td>72</td>
<td>4</td>
<td>98.8%</td>
<td>48%</td>
</tr>
<tr>
<td>≥5</td>
<td>17</td>
<td>19</td>
<td>98.8%</td>
<td>48%</td>
</tr>
<tr>
<td>&lt;6</td>
<td>80</td>
<td>6</td>
<td>90%</td>
<td>74%</td>
</tr>
<tr>
<td>≥6</td>
<td>9</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;7</td>
<td>81</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥7</td>
<td>8</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;8</td>
<td>88</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥8</td>
<td>1</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;9</td>
<td>88</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥9</td>
<td>1</td>
<td>11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table-14
COMPUTATION OF SENSITIVITY AND SPECIFICITY FOR CSI SCORE
three organs affected should be taken special care of, as involvement one more organ will place the patient in very high risk mortality group.

As per Table No.5 patients with single organ involvement had either cerebral malaria or acute renal failure. Patients with two or three organs involved had mainly a combination of cerebral, renal failure or jaundice with ARDS, shock and DIC as one of the complication only in a few cases. In patients with four or five organ involvement cerebral, renal failure and jaundice were present in almost all cases whereas ARDS, shock and/or DIC was the fourth or fifth complication in most of those who died.

The mean pulse rate in all cases was around 100. In the death group the mean pulse rate was 108 which was significantly higher (p value 0.0192) than that in the survival group. However there was no significant difference in the Mean BP and Temperature in the survival and death group (Table No.6). The mean BP was 81.48 ± 22.58 in the death group compared to 86.81 ± 19.72 in the survival group. The mean temperature in all cases was 100.37 ±1.6 i.e., most of the cases were febrile at presentation. The mean respiratory rate in the death group was around 28/minute compared to 22/minute in the survival group which was significantly higher (p<0.0001).

Haemoglobin levels in both survival and death groups were not significantly different in this study. The mean haemoglobin levels were 10.06 ± 2.6 gm/dl for survival group and 10.23 ± 2.28 gm/dl for death group.

There was no significant difference in the TLC in survival and death group. The mean TLC in the survival group was 9404 ± 3085 compared to 10539 ± 4029 in the death group. In malaria total leukocyte count is usually normal. Ladhani et al59 (2002) have however shown leukocytosis can occur especially when associated with severe malaria and superadded bacterial infections. Facer CA et al60 (1994) had shown that leucopenia is at times found in Falciparum malaria and it may be as low as 1000-2000/cmm. But in this study none of the patients had leucopenia.

The mean urea in the survival group was 140.3 ± 93.0 compared to 203.2 ± 72 in the death group which was statistically significant (p=0.0032). Similarly the serum creatinine was also significantly different between the two groups (p=0.0462). The mean creatinine levels were 4.8 ± 4.4 mg/dl for survival group and 6.71 ± 3.84 gm/dl for death group.

The total bilirubin in the survival group was 8.22 ± 10.03 mg/dl compared to 16.96 ± 11.33 mg/dl in the death group which was statistically significant (p=0.0020) (Table No. 7). This signifies that a higher level of jaundice is a major contributor to death. Similarly the mean values of SGPT and ALP were significantly different in the survival and death group. However the SGOT levels were not significantly different between the two groups.

As shown in Table No. 8 any patient who died had an average of four organs involved compared to only two organ involvement in a patient who survived (p<0.0001).This signifies that outcome in severe falciparum malaria very much depends on the number of complications and the probability of death is very high once four or more organs are involved. Similarly the Glasgow Coma Score is also a very good predictor of mortality. The average GCS score in the survival group was 10.58±3.34 compared to 7.61±3.1 in the death group which is statistically significant (p=0.0003).

Respiratory rate had a significant impact on the outcome. Out of the 25 patients who had a respiratory rate of more than 24 twelve died that means almost 50% deaths.

MSA score is an easy to calculate score. One patient died in the group having a score of 3 or less. It was 11.8% with a score of 4-6 and 73.7% when the score was 7 or more. The cut-off score was found to be 6 which could predict mortality with a sensitivity of 64% and a specificity of 95.6%.

APACHE II score is very cumbersome. Only one patient died among the cases having a score of less than 10. The mortality was 13.5% in patients having a score of 11 to 15 and it rose steeply after that. The death rate rises from 38.1% in patients with a score of 16-20 to 60% in those having a score of 21-25. The cut-off score was found to be 15. It could predict mortality with a sensitivity of 78.7% and a specificity of 78.3%.

CSI score, originally developed to predict outcome in cerebral malaria showed quite low mortality (only 5.2%) when the score was 4 or less. But it rose
to 38.55 with a score of 5-9 and reached 90% with a score of 10-14. The cut-off score was determined to be 5 which could predict mortality with a sensitivity of 81% and a specificity of 82.6%.

APACHE II score has 11 physiological variables and so is difficult to remember and cumbersome to calculate. Excluding the four vitals rest seven are laboratory parameters. Although the two hematological parameters (namely hematocrit and total leukocyte count) and the three biochemical parameters namely serum creatinine, sodium and potassium can be done in a standard laboratory, the rest two pH and paO2 need ABG analysis. As described previously ABG analysis requires trained personnel for drawing arterial blood, heparin as anticoagulant and a sophisticated laboratory having ABG analyzer machine. So APACHE II score can be sued in tertiary centers with ICU care and is not meant for general use.

In contrast the MSA score is simple and easy to calculate. Of the four variables needed to calculate this score two namely severe anemia (hemoglobin <5 gm/dl) and acute renal failure (creatinine > 3mg/dl) are quantitative and can be done in any standard laboratory. The third variable respiratory distress needing ventilator support is considered to avoid Observer bias.

In the CSI score all the five variables are qualitative which increases the observer bias. As the score was devised for predicting outcome in cerebral malaria it has level of consciousness and multiple convulsions as two of its variables. Its third variable labored respiration is not well defined. The last two variables circulatory collapse and abnormal bleeding are not common.

Summary & Conclusion

The present study entitled SCORING SYSTEM FOR PREDICTION OF OUTCOME IN SEVERE FALCIPARUM MALARIA was conducted from November, 2010 to September 2012 in the Department of Medicine M.K.C.G. Medical College, Berhampur, Orissa. In this study 112 cases of severe falciparum malaria were included of which 23 died and 89 survived.

The aim of the study was to assess the severity of organ dysfunction in malaria, to find out the utility of MSA scoring system for predicting outcome in severe falciparum malaria in Southern Odisha by comparing with other scoring systems like the APACHE-II scoring system and the CSI scoring system.

There was no significant difference in the age and gender distribution of cases between survival group and death group.

Cerebral malaria was the most common complication occurring in about three-fourth of all cases and in more than 95% of cases in the death group. Although Renal failure and Jaundice were present in two-third of all cases, they were present as a complication in most of the cases who died.

The death rate increases from no death with one organ involvement to 100% death with five or more organ involved. The death rate rises steeply with the involvement of 4 or more organs. Patients with two or three organs involved had mainly a combination of cerebral, renal failure or jaundice.

In the death group the mean pulse rate was 108 which was significantly higher (p value 0.0192) than that in the survival group. However there was no significant difference in the Mean BP and Temperature in the survival and death group. The mean respiratory rate in the death group was around 28/minute compared to 22/ minute in the survival group which was significantly higher (p<0.0001).

The mean haemoglobin levels were 10.06 ± 2.6 gm/dl for survival group and 10.23 ± 2.28 gm/dl for death group (p=0.0982).Similarly there was no significant difference in the TLC in survival and death group.

The mean urea and creatinine levels were significantly higher in the death group as compared to the survival group. A higher level of jaundice was a major contributor to death as evidenced by a total bilirubin of 16.96 ± 11.33 mg/dl in the death group compared to 8.22 ± 10.03 mg/dl in the survival group. Similarly the mean values of SGPT and ALP were also significantly different in the survival and death group.

Any patient who died had an average of four organs involved compared to only two organ involvement in a patient who survived (p<0.0001). The
average GCS score in the survival group was 10.58±3.34 compared to 7.61 ±3.1 in the death group which is statistically significant.

Respiratory rate and GCS turned out to be very good predictors of mortality. The death rate in patients with a respiratory rate of >24/min was 48% and a GCS of less than 7 was 61.9% which is alarmingly high.

MSA Score could predict mortality with a sensitivity of 94.4% at a cut-off score of 7 and with a sensitivity of 64% at a cut-off score of 6. Similarly APACHE II score could predict mortality with a sensitivity of 78.7% at a cut-off score of 15 and CSI score could predict mortality with a sensitivity of 81% at a cut-off score of 5. Thus it is found that there is not much difference in sensitivity among the three scoring systems in predicting outcome in severe falciparum malaria.

APACHE II scoring is very cumbersome and difficult to remember. CSI scoring has too many subjective variables. On the otherhand, MSA scoring system is simple, easy to remember and calculate and is devoid of observer bias. For these reasons it is very useful especially in hospitals like MKCG Medical College and Hospital where patients from throughout South Odisha and nearby districts of Andhra Pradesh come in huge numbers everyday and most of them in very seek conditions.

Bibliography

Introduction:
Hypertensive disorders of pregnancy complicates about 7-10% of all pregnancies. All obstetricians dread preeclampsia (PE) for its potential maternal (12.6% of maternal deaths) and fetal complications. The 8th Confidential Enquiry into maternal and child health revealed preeclampsia and eclampsia as the second leading cause of direct maternal death, thereby contributing to a maternal death rate of 0.83 / 100,000 maternities.

Recent guidance from the National Institute for Health and Clinical Excellence, UK, recommends inpatient treatment of severe hypertension of pregnancy with labetalol (oral or intravenous), intravenous hydralazine or oral nifedipine as first-line alternative antihypertensives within the critical care setting.

Aims & Objectives:
To compare intravenous labetalol with oral nifedipine in the following aspects
1. Their rapidity in controlling hypertension
2. Efficacy
3. Side effect profile

Materials & Methods:
Place of study: Department of Obstetrics & Gynaecology, SCB Medical College & Hospital, Cuttack.
Period of study: July 2010 to July 2012.

Inclusion criteria:
Following criteria were observed during selection of patients.
1. Gestational age >28 wks.
2. Sustained severe hypertension (SBP >160mm Hg and/or DBP >110 mmHg).
3. Maternal heart rate > 60 bpm and < 120bpm.

Exclusion criteria
The following cases were excluded from the study
1. Women with history of heart rhythm abnormality or heart failure.
2. Patients having bronchial asthma.
3. Allergy to either nifedipine or labetalol.
4. Any antihypertensive treatment in the preceding 72 hrs.
5. Severe renal failure / hepatic failure.

Methods:
It was a prospective study. Pregnant women with severe hypertension who required acute blood pressure control were admitted to the Labour Room of O&G department. After necessary protocol the patients were randomized into two groups to receive either oral nifedipine or intravenous labetalol. Patients in the labetalol arm were administered intravenous labetalol in escalating doses of 20 mg, 40 mg, 80 mg & 80 mg till the target blood pressure (150/100) was reached. Once BP d” 150/100 then maintenance dose of labetalol 200mg tablets were given orally at 8 hour intervals. In a similar fashion nifedipine (10 mg) capsules were given orally to the patients every 30 minutes till target BP was reached, upto a maximum of 4 doses. Once achieved the BP was maintained with nifedipine (10mg) capsules 6 hourly. If BP was not controlled within the stipulated doses then the patient was tagged as a Resistant Case and treated with alternative antihypertensives. We followed the recent guidelines by the NHBPEP Working Group (2000), the ACOG (2002 a) and the RCOG (2006) for the dosing schedule.

Data analysis:
The primary outcome of the trial was the time taken to achieve the target systolic blood pressure of
d” 150 mm Hg and diastolic blood pressure d” 100 mm Hg (both targets to be fulfilled). Secondary outcomes were total number of antihypertensive doses required to achieve target blood pressure, systolic and diastolic blood pressure profile, maternal heart rate profile, pregnancy outcome, fetal status, maternal hypotension (BP < 90/60 mm Hg), and the side effect profile.

Tables & Discussion:

In this study the safety and efficacy of both intravenous labetalol and oral nifedipine are compared along with the various demographic trends of the hypertensive diseases in our setting. As discussed below both the groups are comparable in relation to various baseline characteristics so that they would not bias the comparison.

Profile Of Mean Systolic Bp (In Mm Hg)
During First Two Hours

<table>
<thead>
<tr>
<th>TIME(in mins)</th>
<th>LABETALOL</th>
<th>NIFEDIPINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>181.32</td>
<td>182.32</td>
</tr>
<tr>
<td>10</td>
<td>161.52</td>
<td>172.8</td>
</tr>
<tr>
<td>20</td>
<td>148.64</td>
<td>165.52</td>
</tr>
<tr>
<td>30</td>
<td>141.04</td>
<td>158.88</td>
</tr>
<tr>
<td>40</td>
<td>135.28</td>
<td>152.4</td>
</tr>
<tr>
<td>50</td>
<td>130.16</td>
<td>148.32</td>
</tr>
<tr>
<td>60</td>
<td>126.72</td>
<td>143.04</td>
</tr>
<tr>
<td>70</td>
<td>124.3</td>
<td>139.09</td>
</tr>
<tr>
<td>80</td>
<td>122.4</td>
<td>136.72</td>
</tr>
<tr>
<td>90</td>
<td>120.5</td>
<td>133.04</td>
</tr>
<tr>
<td>100</td>
<td>121.6</td>
<td>129.44</td>
</tr>
<tr>
<td>110</td>
<td>122.4</td>
<td>126.8</td>
</tr>
<tr>
<td>120</td>
<td>124.6</td>
<td>125.2</td>
</tr>
</tbody>
</table>

From the above table, it is apparent that the target systolic blood pressure (d” 150 mm Hg) was reached by both the groups. But the patients in the Labetalol group took considerably less time (20 minutes) to reach the target value in comparison to Nifedipine group (30 minutes).

Profile Of Mean Diastolic Bp (In Mm Hg)
During First Two Hours

<table>
<thead>
<tr>
<th>TIME (in mins)</th>
<th>LABETALOL</th>
<th>NIFEDIPINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>112.96</td>
<td>111.6</td>
</tr>
<tr>
<td>10</td>
<td>104.4</td>
<td>105.52</td>
</tr>
<tr>
<td>20</td>
<td>98.4</td>
<td>101.84</td>
</tr>
<tr>
<td>30</td>
<td>93.44</td>
<td>99.28</td>
</tr>
<tr>
<td>40</td>
<td>90.08</td>
<td>96.64</td>
</tr>
<tr>
<td>50</td>
<td>87.28</td>
<td>94.88</td>
</tr>
<tr>
<td>60</td>
<td>85.44</td>
<td>92.32</td>
</tr>
<tr>
<td>70</td>
<td>84.2</td>
<td>90.24</td>
</tr>
<tr>
<td>80</td>
<td>82.6</td>
<td>88.8</td>
</tr>
<tr>
<td>90</td>
<td>80.42</td>
<td>85.92</td>
</tr>
<tr>
<td>100</td>
<td>81.4</td>
<td>84.32</td>
</tr>
<tr>
<td>110</td>
<td>80.3</td>
<td>82.56</td>
</tr>
<tr>
<td>120</td>
<td>79.6</td>
<td>81.52</td>
</tr>
</tbody>
</table>

From the above table, it is apparent that the target diastolic blood pressure (d” 100 mm Hg) was reached by both the groups. But the patients in the Labetalol group took considerably less time (20 minutes) to reach the target value in comparison to Nifedipine group (30 minutes).

Profile Of Mean Heart Rate (During First 1 Hour)

<table>
<thead>
<tr>
<th>TIME (in minutes)</th>
<th>LABETALOL</th>
<th>NIFEDIPINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>90.46</td>
<td>91.22</td>
</tr>
<tr>
<td>10</td>
<td>89.98</td>
<td>93.46</td>
</tr>
<tr>
<td>20</td>
<td>86.82</td>
<td>96.51</td>
</tr>
<tr>
<td>30</td>
<td>83.44</td>
<td>98.14</td>
</tr>
<tr>
<td>40</td>
<td>81.62</td>
<td>100.46</td>
</tr>
<tr>
<td>50</td>
<td>79.46</td>
<td>101.88</td>
</tr>
<tr>
<td>60</td>
<td>78.12</td>
<td>103.35</td>
</tr>
</tbody>
</table>

From the above table, it is apparent that patients in the Labetalol group showed a tendency towards bradycardia with a gradual fall of maternal heart rate (90.46 to 78.12 beats per minute). The patients in the Nifedipine group showed a tendency towards tachycardia with a gradual increase of maternal heart rate (91.22 to 103.35 beats per minute) in the first 1 hour.
Mean Doses Required

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean No. of Doses</th>
<th>S.D.</th>
<th>S.E.</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LABETALOL</td>
<td>50</td>
<td>1.7200</td>
<td>92670</td>
<td>13106</td>
<td>.102</td>
</tr>
<tr>
<td>NIFEDIPINE</td>
<td>50</td>
<td>2.0400</td>
<td>1.009</td>
<td>14274</td>
<td></td>
</tr>
</tbody>
</table>

It is apparent that the mean number of doses required for the blood pressure to reach the target value is 1.72 for Labetalol and 2.04 for Nifedipine. The P value > .05 and hence is not significant.

TIME TAKEN (in minutes)

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean Time</th>
<th>S.d.</th>
<th>S.e.</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LABETALOL</td>
<td>50</td>
<td>17.2000</td>
<td>9.2670</td>
<td>1.31055</td>
<td>.001</td>
</tr>
<tr>
<td>NIFEDIPINE</td>
<td>50</td>
<td>47.6000</td>
<td>32.23384</td>
<td>4.55855</td>
<td></td>
</tr>
</tbody>
</table>

It is apparent that the mean time taken to reach the target Blood pressure for Labetalol was 17.2±9.2 minutes and for Nifedipine was 47.6±32.2 minutes. The P value < .05. Hence, the result is significant.

Mode Of Delivery

<table>
<thead>
<tr>
<th>Mode of Delivery</th>
<th>Labetalol</th>
<th>Nifedipine</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>VD</td>
<td>33(55.9%)</td>
<td>26(44.1%)</td>
<td>59</td>
</tr>
<tr>
<td>LSCS</td>
<td>17(41.5%)</td>
<td>24(58.5%)</td>
<td>41</td>
</tr>
<tr>
<td>TOTAL</td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

PEARSON CHI-SQUARE = 2.026, DF = 1, P - VALUE = 0.155, i.e. >.05

Majority of cases (59%) had vaginal delivery. 41% of the patients had Lower Segment Caesarean Section.

Of the 59 patients in the Vaginal delivery group, 33 cases (55.9%) belonged to Labetalol group and 26 cases (44.1%) belonged to Nifedipine group. Of the 41 patients in the LSCS group 17 cases (41.5%) belonged to Labetalol group and 24 cases (58.5%) belonged to Nifedipine group.

Though the percentage of vaginal deliveries for labetalol was more than that for nifedipine, the variation in the mode of delivery pattern for both the arms is not significant (P - value > 0.05).

Perinatal Morbidity

<table>
<thead>
<tr>
<th>Perinatal Morbidity</th>
<th>Labetalol</th>
<th>Nifedipine</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRESENT</td>
<td>8(38.1%)</td>
<td>13(61.9%)</td>
<td>21</td>
</tr>
<tr>
<td>ABSENT</td>
<td>39(54.1%)</td>
<td>33(45.9%)</td>
<td>72</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>46</td>
<td>93</td>
</tr>
</tbody>
</table>

PEARSON CHI-SQUARE = 1.680, DF = 1, P - VALUE = 0.147, i.e. > 0.05

From the above table, it is apparent that only 21 cases had perinatal morbidity. Of them, 8 cases (38.1%) belonged to Labetalol arm and 13 cases (61.9%) belonged to Nifedipine arm. The value is not significant (P-value > 0.05).

Adverse Reactions

<table>
<thead>
<tr>
<th>Adverse Reactions</th>
<th>Labetalol</th>
<th>Nifedipine</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>41(50.6%)</td>
<td>40(49.4%)</td>
<td>81</td>
</tr>
<tr>
<td>YES</td>
<td>9(47.4%)</td>
<td>10(52.6%)</td>
<td>19</td>
</tr>
<tr>
<td>TOTAL</td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

PEARSON CHI-SQUARE = 0.065, DF = 1, P - VALUE = 0.799, (i.e.>0.05)

From the above table, it is apparent that the majority (81%) of the cases had no adverse reactions. Only 19 cases had adverse reactions to either of the 2 drugs out of which 9 cases (47.4%) belonged to Labetalol arm and 10 cases (52.6%) belonged to Nifedipine arm. The difference is by chance and statistically not significant (P-value > 0.05).

Types Of Adverse Reactions

<table>
<thead>
<tr>
<th>Types Of Adverse Reactions</th>
<th>Labetalol</th>
<th>Nifedipine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea/vomiting</td>
<td>3(6%)</td>
<td>1(2%)</td>
</tr>
<tr>
<td>Dizziness</td>
<td>2(4%)</td>
<td>1(2%)</td>
</tr>
<tr>
<td>Headache</td>
<td>0</td>
<td>3(6%)</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>0</td>
<td>5(10%)</td>
</tr>
<tr>
<td>Dyspnoea</td>
<td>1(2%)</td>
<td>0</td>
</tr>
<tr>
<td>Hypotension</td>
<td>3(6%)</td>
<td>2(4%)</td>
</tr>
</tbody>
</table>

The above table shows the various types of maternal adverse reactions. 3 cases (6%) had nausea and vomiting in the Labetalol arm and 1 case (2%) in the Nifedipine arm. Dizziness was more common in Labetalol group (4%) than in Nifedipine group (2%).
No patient showed headache or tachycardia in the Labetalol arm, whereas 6% cases showed headache and 10% tachycardia in the Nifedipine arm. Hypotension was more common in Labetalol arm (6% Versus 4%). Only 1 case of the 100 patients had dyspnoea, which belonged to the Labetalol group.

Summary:

The present study is a prospective study. 100 cases admitted to the labour room were enrolled after fulfilling the inclusion and exclusion criteria. They were randomized into two groups of 50 each to receive either oral nifedipine or intravenous labetalol. All baseline characteristics of the participants stratified according to their randomisation were similar across the two groups.

Labetalol could not be proved to have much advantage over Nifedipine with respect to the mode of delivery. Though vaginal delivery was more common in Labetalol group (55.9% versus 44.1%), the value is statistically not significant.

Regarding antihypertensive action, both the drugs were found to be effective in controlling hypertension. But the time taken by Labetalol to reach the target blood pressure was less (17.2 minutes) as compared to that of Nifedipine (47.6 minutes). This value is statistically significant. The mean heart rate of patients showed a gradual decline during the first one hour in case of labetalol, whereas it increased in the nifedipine group.

Similarly regarding adverse reactions, there was no statistical significant difference between the 2 drugs. Nausea & vomiting, dizziness and breathlessness were more common in the labetalol group. Tachycardia and headache were more common in the nifedipine group. Hypotension was more common in the labetalol group (3 versus 2 cases). No other major side effects were seen.

Perinatal morbidity (13 versus 8 cases) and SCNU admission (10 versus 6 cases) were more for nifedipine than for labetalol group. Precipitous fall in blood pressure leading to shock and fetal demise was more in case of nifedipine than for labetalol arm (2 versus 1 stillborn). But the overall perinatal outcome for both the drugs in this study had no statistical significant difference between them.

Based on all these observations, analysis and inferences it is conclusive that both Labetalol and Nifedipine are effective drugs in controlling acute severe hypertension but Labetalol controls blood pressure more rapidly than Nifedipine.

This study was a small study taking fifty patients each for both the drugs. Large multicentric trials are required to highlight the difference in outcome variables with greater statistical significance and definitively prove the superiority of one drug over the other.

Conclusion

The Cochrane review on drugs for the treatment of very high blood pressure in pregnancy concluded that until better evidence is available, the choice of antihypertensive should depend on the clinician’s experience and familiarity with a particular drug and on what is known about its adverse effects.

In this study, we found that both Labetalol and Nifedipine regimens are effective and well tolerated when used for the control of blood pressure in acute severe hypertension of pregnancy. But due to its rapid onset of action, the absence of tachycardia and no significant adverse reaction Labetalol may be preferable to Nifedipine. It can safely be used as the first line antihypertensive therapy in hypertensive emergencies.

Bibliography

5. ACOG, hypertension in pregnancy. ACOG technical


MRI Evaluation of Spinal Cord Tumors with Histopathological Correlation
S. Choudary¹, J. Mohanty², S. Parida³, B. Manjari Swain³, K. Parida³, B. Durai⁴

Abstract:
Spinal cord tumors are relatively rare tumors and can present with a wide variety of symptoms. MRI is the most commonly used modality for spinal cord tumor diagnosis unless there is a contraindication. MRI can accurately characterize the tumor in 88.46% of the spinal cord tumors.

Aims And Objectives:
The objectives of this dissertation titled "MRI Evaluation of Spinal Cord Tumors with Histopathological Correlation" are as follows:
1. To study the demographic profile of patients with spinal cord tumors.
2. To assess the distribution, features, localization & extent of spinal cord tumors by MRI.
3. To correlate the tissue characterization by MRI with that of HP examination.

Source of Data: The study was conducted in the departments of Radiodiagnosis, Neurosurgery and Pathology, SCB Medical College, Cuttack.

Study Period: October 2010 to October 2012
Study Design: Prospective study

Inclusion Criteria: Patients of all age groups belonging to either sex with spinal cord tumors diagnosed by clinical examination and MRI of spine were included.

Exclusion Criteria: Those patients with spinal symptoms and pathology due to infections, prolapsed intervertebral disc, and trauma were excluded from the study.

Magnetic Resonance Imaging Machine & Technique: All the MRI scans of the spinal cord in this study were performed using GE Signa HDX MR machine with a 1.5 tesla field strength magnet. Precontrast images were taken followed by postcontrast images with intravenous administration of 0.1 mmol/kg of body weight of gadolinium. The standard imaging protocol used was T1, T2 sagittal, axial, coronal and T1 post contrast axial, sagittal, coronal planes.

Results:
Out of the 52 patients with spinal cord tumors, 28 patients (54%) were males and females made up around 46% (24 patients). The male female ratio was 1.17:1. Around 6% of the patients were in the pediatric age group and the rest were adults. Our study showed that intradural extramedullary tumors 36/52 (69%) were the commonest, followed by intramedullary tumors 10/52 (19%) and extradural tumors 6/52 (12%). Overall, schwannoma was the commonest spinal cord tumor accounting for 46.1% of the tumors. Other tumors in decreasing order of frequency were meningiomas 7/52 (13.5%), neurofibromas 5/52 (9.6%), ependymomas 5/52 (9.6%), astrocytomas 2/52 (3.8%), metastases 2/52 (3.8%), one each (1.9%) of hemangioblastoma, lipoma, PNET, hemangioma, epidermoid cyst, arachnoid cyst, and extranodal Rosai Dorfmann disease.

T2 Saggital - Schwannoma
Ependymoma was the commonest intramedullary tumor accounting for 50% of the intramedullary tumors. Schwannoma was the commonest intradural extramedullary tumor accounting for 63.9% of them. Metastases were the commonest extradural tumor accounting for 33.33% of them.

Out of 52 cases, MRI diagnosed 46 cases correctly. Out of the 6 wrongly diagnosed cases, 3 were intradural extramedullary, 2 were extradural and 1 was intramedullary in location. Overall, MRI was able to correctly diagnose 88.46% of the spinal cord tumors. MRI was able to correctly diagnose 91.67% of the intradural extramedullary tumors, 90% of the intramedullary tumors, and 66.67% of the extradural tumors. MRI misdiagnosed 6 cases. MRI misdiagnosed PNET, neurofibroma, schwannoma (2 cases), extranodal Rosai Dorfmann disease, and ependymoma as Ewing sarcoma, schwannoma, neurofibroma (2 cases), metastases, and astrocytoma respectively.

Spinal tumors showed female predominance. Chung et al. [1] conducted a retrospective study at Korea of MR images for spinal cord tumors in 39 patients. Of the 39 patients, 18 (46.2%) were males and 21 (53.8%) were females. 38 (97.4%) patients were adults and only one (2.6%) patient was a child.

Schwannomas were the commonest tumors. Chung et al. [1] reported schwannomas 19/39 (48.7%) as the commonest tumor in their study, followed by meningiomas 5/39 (12.8%), neurofibromas 4/39 (10.3%), hemangiomas 3/39 (7.7%), arachnoid cysts 2/39 (5.1%) and one each (2.5%) of giant cell tumor of the tendon sheath, ganglioneuroma, lymphoma, neuroblastoma, metastatic tumor from the prostate, arteriovenous malformation. In the study by Chung et al. [1], intradural extramedullary tumors 36/39 (92.3%) were the commonest. 3 cases (7.7%) were extradural tumors and no intramedullary tumors.
In the intramedullary compartment in adults, ependymomas (10.2%) were the commonest tumors followed by astrocytomas (4.1%), hemangioblastoma (2%), epidermoid cyst (2%), and lipoma (2%). Parizel et al. [2] also reported that ependymomas and astrocytomas are the two commonest tumors in adults. Engelhard et al. [70] also reported that ependymomas (23.7%) were the commonest intramedullary tumors in their series. Chung et al. [1] reported 19 cases of schwannomas out of 39 cases of spinal cord tumors. All cases appeared hypointense on T1W images and hyperintense on T2W images. 9 cases showed heterogeneous enhancement, 7 cases showed homogeneous enhancement, and 3 cases showed rim enhancement. Eastwood et al. [3] reported the findings of diffusion-weighted MR imaging in a patient with spinal meningioma.

Chung et al. [1] reported 4 cases of intradural extramedullary neurofibromas in 39 spinal cord tumor cases. The patients were aged 8 to 39 years. M:F ratio was 1:1. 1 was located in the cervical region, 2 were in the thoracic region, and 1 was in the lumbar region. 50% were isointense, 50% were intermediate in intensity on T1W images. All were hyperintense on T2W images. All lesions demonstrated homogeneous enhancement. Engelhard et al. [4] reported 6 cases of intradural extramedullary neurofibromas accounting for 1.4% of the 430 primary spinal cord tumors in his study.

Kahan et al. [5] reported the MR characteristics of spinal ependymomas in 26 patients .77% of the cases were isointense or hypointense on T1W images and 92% were hyperintense on T2W sequences. 38% of the cases demonstrated homogeneous enhancement, 31% heterogeneous enhancement, and 19% rim enhancement. Seo et al. [6] studied 19 patients with primary intramedullary astrocytomas. On T1W images, 37% were isointense, 58% were hypointense, and 5% were hyperintense. On T2W images, 95% were hyperintense and 5% were isointense. 37% of them were associated with surrounding edema. Williams et al. [7] reported 9 cases of intramedullary tumors in their study of 33 patients with intramedullary lesions. Out of 9 tumors, 5 were astrocytomas, 3 were ependymomas, and one was a lipoma. Stimac et al. [8] reported 7 cases of metastases in the extradural compartment. The primary tumor was in the prostate in 3 cases, in the breast in 2 cases, one each in colon and lung. Chu et al. [9] reported 32 tumors of hemangioblastoma in 12 patients. Five had VHL disease and 4 of them had multiple tumors and one had a solitary tumor.

**Conclusion:**

The following things can be concluded from this study:

1. MRI is an important imaging modality which can accurately assess the distribution, features, localization, and extent of spinal cord tumors.
2. MRI can accurately characterize the tumor tissue in 88.46% of the spinal cord tumors, 91.67% of the intradural extramedullary tumors, 90% of the intramedullary tumors, and 66.67% of the extradural tumors. Advanced MRI techniques may help in better tissue characterization.

**Key Words:**

T1WI - T1 weighted image
T2WI - T2 weighted image
MRI - Magnetic Resonance Imaging
HPR - Histopathological report
M - Male
F - Female
C - Cervical
D - Dorsal / Thoracic
PNET - Primitive Neuroectodermal Tumor

**Bibliography:**


The following office bearers of RSSDI Odisha State Chapter (2013-14) were elected at last General Body Meeting at Cuttack

Chairman : Prof. (Dr.) Sidhartha Das, Cuttack
Imm. Past Chairman : Dr. K.C. Sahu, Bhubaneswar
Vice-Chairman : Dr. S.K. Mohapatro, Bhubaneswar
Chapter Secretary : Dr. Jayanta K. Panda, Cuttack
Imm. Past Secretary : Dr. Jagannath Mahapatra, Bhubaneswar
Joint Secretary : Prof. (Dr.) K.N. Padhiary, Burla
Chapter Treasurer : Dr. P.K. Rathor, Cuttack

MEMBER TO GOVERNING BODY

Dr. S.D. Mishra, Cuttack
Prof. (Dr.) R.K. Das, Berhampur
Dr. Bharat Panigrahi, Bhubaneswar
Dr. M.J. Dora, Jharsuguda
Dr. Sanjay Das, Talcher
Voluntary sterilization is possibly the most popular method of fertility control all over the world. Worldwide, female sterilization is used by 33% of married women using contraception(4). Tubal ligation is approx. 99% effective in the first year following the procedure(3). The effectiveness may be reduced slightly later on since the fallopian tubes can, in some cases, reform or reconnect which can cause unwanted pregnancy. Method failure is difficult to detect, except by subsequent pregnancy.

84% of those failures occur >1 year after sterilisation (1,3). Approximately 5% of women who have had tubal ligation will have a failure due to ectopic pregnancy(1). Time seems to be a factor as the risk of failure increases after 1 or more years post-surgery. The risk of ectopic pregnancy is 12.5% for women having tubal ligation but less than those women who have not had the surgery(4). Recanalisation or formation of tubo-peritoneal fistulas occur, the openings of which are large enough for passage of sperm but too small to allow an ovum to push through, resulting in fertilization / implantation in the distal tubal segment.

**Aim of The Study :**

To study the incidence of post-sterilization ectopic pregnancies in women who underwent various methods of sterilization and their relation to age, parity, sterilization-ectopic interval, type of method adopted, timing of sterilization and association with symptoms of PID prior to surgery.

**Method :**

A cross-sectional study was conducted from May 11’ - April 12’ in the dept of O&G, S.C.B. Medical college, Cuttack. Total no. of ectopic pregnancies reported were 166, out of which 14 cases were after sterilization failure. A detailed history was taken from these 14 cases with regards to their age and parity, type of sterilization, place of sterilization, timing of sterilization, interval between sterilization and ectopic pregnancy and association with symptoms of PID prior to surgery. The results were tabulated as graphs and tables.

**Comparison With Results Of Similar Studies**

According to a study conducted by JP Shah, SV Parulekar, IN Hinduja, Department of Obstetric and Gynaecology, Seth G.S. Medical College, Mumbai, between 1984 &1989:

a) Out of 287 laparotomies conducted for ruptured/ unruptured ectopic pregnancies, 13 (4.53 %) cases were after sterilisation failure, as against 8% in this study.

b) Most of the women were of parity 2 and average age of 30 years, similar to this study.

c) 84.6% of ectopics occurred >1 year after sterilisation, as against 71.5% in this study.

d) 52.3% of patients had undergone sterilisation in puerperal period as against 36% in this study.

**Conclusion :**

Sterilization operations at camps had more chance of being failed sterilization in the form of disturbed tubal ectopic pregnancies.

Sterilization operations at camps still remains a target oriented approach rather than as attempt at providing quality care. Our goal should therefore be to provide client and quality oriented service rather than as a mission to reach the targets set up at Government levels.
### ANALYSIS OF DATA FROM CASES OF ECTOPIC PREGNANCY AFTER TUBAL STERILISATION (n=14)

<table>
<thead>
<tr>
<th>CASES</th>
<th>AGE/PARITY</th>
<th>TYPE OF STERILISATION</th>
<th>PLACE</th>
<th>TIME</th>
<th>STERILISATION-ECTOPIC INTERVAL</th>
<th>TYPE OF ECTOPIC</th>
<th>PID SYMPTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30/3</td>
<td>Laparoscopy</td>
<td>Camp</td>
<td>Interval</td>
<td>3 Years</td>
<td>Ruptured</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>31/3</td>
<td>Laparoscopy</td>
<td>Camp</td>
<td>Interval</td>
<td>2 Years</td>
<td>Ruptured</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>30/2</td>
<td>Laparoscopy</td>
<td>Hospital</td>
<td>Interval</td>
<td>1 Year</td>
<td>Ruptured</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>30/2</td>
<td>Concurrent</td>
<td>Hospital</td>
<td>LSCS</td>
<td>1 Year</td>
<td>Ruptured</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>32/3</td>
<td>Laparoscopy</td>
<td>Camp</td>
<td>Interval</td>
<td>3 Years</td>
<td>Ruptured</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>31/3</td>
<td>Minilap</td>
<td>Camp</td>
<td>Puerperal</td>
<td>2 Years</td>
<td>Tubal Abortion</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>32/2</td>
<td>Laparoscopy</td>
<td>Camp</td>
<td>Interval</td>
<td>2 Years</td>
<td>Ruptured</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>30/2</td>
<td>Laparoscopy</td>
<td>Camp</td>
<td>Interval</td>
<td>1 Year</td>
<td>Ruptured</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>32/3</td>
<td>Laparoscopy</td>
<td>Camp</td>
<td>Puerperal</td>
<td>2 Years</td>
<td>Ruptured</td>
<td>Yes</td>
</tr>
<tr>
<td>10</td>
<td>30/2</td>
<td>Laparoscopy</td>
<td>Camp</td>
<td>Interval</td>
<td>1 Year</td>
<td>Ruptured</td>
<td>Yes</td>
</tr>
<tr>
<td>11</td>
<td>33/3</td>
<td>Laparoscopy</td>
<td>Camp</td>
<td>Interval</td>
<td>2 Years</td>
<td>Ruptured</td>
<td>Yes</td>
</tr>
<tr>
<td>12</td>
<td>30/2</td>
<td>Concurrent</td>
<td>Hospital</td>
<td>LSCS</td>
<td>2 Years</td>
<td>Tubal Abortion</td>
<td>No</td>
</tr>
<tr>
<td>13</td>
<td>32/2</td>
<td>Laparoscopy</td>
<td>Hospital</td>
<td>Interval</td>
<td>3 Years</td>
<td>Ruptured</td>
<td>No</td>
</tr>
<tr>
<td>14</td>
<td>33/2</td>
<td>Minilap</td>
<td>Camp</td>
<td>Puerperal</td>
<td>3 Years</td>
<td>Ruptured</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### References:


An Observational Study of Septic Abortion in SCB Medical College

S.C. Behera¹, R. Ghadei²

Abstract

Objective: To study the incidence of septic abortion in relation to race, age group, socio economic status, gestational age, mode of termination of pregnancy, management, complications and mortality rate.

Methods: This observational study of septic abortion of 50 cases with reference to the age, parity, literacy, gestational age distribution and clinical features, complications, and management was carried out in the department of Obstetrics and Gynaecology, S.C.B. Medical College, Cuttack.

Result: The minimum age was 19 years and maximum age was 41 years. Most of the cases were from urban slum area (44%) and least cases were from urban (24%) and average parity was para 4. Average gestational age was 9.76 weeks of pregnancy. The cardinal clinical presentations were bleeding per vaginum and foul smelling vaginal discharge were (60%), abdominal pain (62%), fever (74%) and abdominal distension (22%). Nine deaths (18%) occurred due to sepsis related complications in 6 (ARDS -1, Septicaemia with ARF -3, Septic shock -1, MODS -1).

Conclusion: Reducing morbidity and mortality will require stringent regulations and commitment at midlevel providers. The unauthorized providers must be dissuaded to provide pregnancy termination due to the risks involved, and counselled to refer such women to government centres with facilities, failing which they should be severely penalized. Further, a wide and intensive dissemination of information about all aspects of abortion and MTP facilities available at hospital / primary health centre is required along with promotion of contraception.

Introduction

Sepsis is by far one of the tripod of major cause of maternal mortality and morbidity. Septic abortion is an infection of the uterus and its appendages following any abortion especially, illegally performed induced abortions. Estimates of the number of abortions performed annually in India vary considerably, from 0.6 million to 6.7 million. In India, Liberal M.T.P. Law (1972) has not shown any appreciable decline in the pattern of morbidity and mortality due to illegal abortion. Lack of awareness, health education, sex education with so many socioeconomic pitfalls, a desired secrecy item lead to post- abortive uterine sepsis causing bacteraemic shock, general coagulation failure etc., the whole episode a difficult one leading to poor results. Despite a liberal abortion law (Medical Termination of Pregnancy Act of 1972), every year an estimated 5.7 million abortions (ten times the legal ones) are conducted illegally in India. While 13 percent of maternal deaths (9-20% in India) are attributed to abortions, no substantial decline in estimated number, reported morbidity and share of illegal abortions as the cause of maternal mortality has occurred. Septic abortion and subsequent complications is the cause of maternal death in 15% to 20% of cases. Although abortion has been legal in India for more than three decades, access to safe services remains limited for most women. For example, it has been estimated that nearly 90% of abortions in India are performed under potentially unsafe conditions in unapproved facilities, by providers ranging from qualified doctors to those without any training or qualifications.

Material and Methods:

This observational study of septic abortion cases with reference to the clinical features, complications, and management was carried out in the department of Obstetrics and Gynaecology, S.C.B. Medical College, Cuttack.

Selection of Cases:

The cases for this study was selected at random irrespective of age and parity among the in patients of
the Department of Obstetrics and Gynaecology, S.C.B. Medical College, Cuttack during the period from Dec 2010 to Dec 2012.

Only the cases of abortions with some of the features mentioned below were selected:

i) Bleeding per vaginum, ii) Rise of temperature, iii) Foul smelling discharge per vaginum, iv) Tachycardia, v) History of interference, vi) Pelvic inflammation, vii) Signs of peritonitis, viii) Renal failure, ix) Or Coagulation failure

Fifty septic abortion cases were taken for the study.

Each of the cases of septic abortion were examined clinically and investigated pathologically to find out the cause of sepsis, in order to plan the management.

During the preliminary examination full note was made regarding the age of the patient, parity, marital status, socio-economic status, duration of gestation, methods of interference and the presenting features. A detail pelvic examination was done in all cases of septic abortion.

Investigation:

Routine haemogram, blood grouping, Urine-R/M & C/S, cervical swabs-C/S, blood urea, serum creatinine, serum bilirubin, serum electrolyte --sodium and potassium done in suspected cases of Grade II and Grade III cases. Ultrasonography (abdomen & pelvis), dilatation & evacuation, posterior colpotomy, laparotomy.

Results

The average age in septic abortion was 27.26 years; the minimum age was 19 years, and maximum age was 41 years. There were 2 cases (4%) below 20 years, 14 cases (28%) between 21 to 25 years, 27 cases (54%) between 26 to 30 years, 4 cases (8%) between 31 to 35 years, 2 cases (4%) between 36 to 40 years. There were only 1 cases (2%) above the age of 40 years. Mean gravidity was 4.00 with a range of 1-8. 3 septic abortion cases (6%) were nulliparous; 9 cases (18%) were primipara; 9 cases (18%) were para 2; 12 cases (24%) were para 3; 5 cases (10%) were para 4; 7 cases (14%) were para 5; 3 cases (6%) were para 6; 2 cases (4%) were para 7 and above. Among the septic abortion cases there were 15 (30%) in whom the gestational age was 8 weeks or < 8 weeks; 29 cases (58%) were between 9 to 12 weeks; 6 cases (12%) were above 12 weeks. Average gestational age was 9.76 weeks. In this above table shows the average age was 27.26 years (SE=0.625, SD=4.425), average gravid was 4 (SE=0.258, SD=1.829), and the average gestational age was 9.76 in weeks (SE=0.325, SD=2.299). 22 (44%) cases of septic abortion were from urban slum; 16 (32%) cases were from rural area and 12 (24%) cases were from urban area. Out of 50 cases of septic abortion 39 cases (78%) belong to hindu religion where 11 cases (22%) of septic abortion belonging to muslim community. Out of 50 cases of septic abortion 47 cases (94%) were house wives and 3 cases (6%) were self employed. 35 cases (70%) of septic abortion were illiterate; 10 cases (20%) were educated upto 5th class where 5 cases (10%) were educated between 6-12th class. Out of 50 cases of septic abortion 13 cases (26%) were very poor; 34 cases (68%) were poor and 3 cases (6%) were belong to average income. Majority of the procedure were done at private clinic (64%), followed by home of either the Dai (16%) or the patient (16%), and in Government clinic only (4%) of septic abortion occurred.

Out of 50 cases of septic abortion, 18 cases (36%) the abortion was induced by a Dai; an ANM 8 cases (16%); a nurse 11 cases (22%) or an unskilled person 1 (2%); all of these were unqualified and incompetent to perform the procedure. Induction in 12 cases (24%) was reported to have been done by doctors. Methods employed for inducing abortion in order of frequency, were curette 37 cases (74%); stick 4 cases (8%); plant root 2 cases (4%); catheter 2 cases (4%); others 4 cases (8%); and not known 1 cases (2%). From the above table, details of presenting complaints were summarised. Patients attended or were referred to our hospital for symptoms like lower abdominal pain 31 (62%), prolonged fever 37 (74%), vomiting 17 (34%), vaginal bleeding 30 (60%), abdominal distension 11 (22%) either with constipation 10 (20%), and inability to pass flatus 6 (12%). Three patients had acute urinary obstruction. Five cases were referred by private nursing homes, perhaps due to economic considerations or complications. Foul smelling discharge and vaginal bleeding were seen in 18 (36%) and 12 (24%) respectively. One patient had intestines coming out of the vagina. Medical complication observed in 50 cases of septic abortion included for this study, there were 6 cases (12%) of shock, 9 cases (18%) were severe anemia, 5 cases (10%) were renal failure,
6 cases (12%) were septicemia, 1 cases (2%) developed acute respiratory distress syndrome and 9 cases (18%) were maternal death. Considering the seriousness of their condition on admission, 38 patients (76%) recovered enough to go home while three left against medical advice. Nine deaths (18%) occurred due to sepsis related complications in 6 (ARDs-1, Septicemia with ARF -3, Septic shock -1, MODS-1). The average duration of stay in the hospital was 18.3±13.7 days (range 1 to 90 days). Out of 50 cases of septic abortion, 14 cases (28%) were undergone conservative management included antibiotics, intravenous fluids, vasopressor support, and oxygen. Many patients were shifted to intensive care due to septic shock, multiple organ dysfunction (MODS) adult respiratory distress syndrome (ARDS) etc. and remaining 36 cases (72%) treated by surgical intervention i.e. Laparotomy was performed for bowel injury, uterine perforation, peritonitis with blood/pus or fecal mate in pouch of Douglas, and adhesions/multiple pus pockets. Out of which, uterine repair was done in 10 cases (20%) , total abdominal hysterectomy was done in 3 cases (6%) , subtotal hysterectomy in 3 cases (6%) , bowel resection and anastomosis in 8 cases (16%) , colpotomy in 6 cases (12%) were done for pelvic abscess while dilatation and evacuation for retained products of conception without laparotomy in 9 cases (18%) and iliostomy in 3 cases (6%) and intestinal repair in 3 cases (6%). Blood transfusion was required in as many as 34 cases (68%). Ultrasonography detected peritoneal fluid in 12 cases (24%) , uterine perforation in 16 cases (32%), tubo-ovarian mass or abscess in 6 cases (12%) , gut perforation in 2 cases (4%) and multiple fluid pockets in peritoneal cavity 8 cases (16%).

Summary and conclusion

A sum total of fifty cases of septic abortion were taken for study in S.C.B. Medical College, Cuttack, faculty of O & G from Dec 2010 to Dec 2012.

The minimum age was 19 years and maximum age was 41 years. The maximum number of cases were found in the age group was 26-30 years (54%) and the average age was 27.26 years. Most of the cases were from urban slum area (44%) and least cases were from urban (24%). Majority of cases belonged poor socio-economic status and most of them were illiterate (70%) . Maximum number of cases i.e. 36% were found to be para1-2 . The average parity was para 4. Most of the septic abortion cases occurred in period of gestational age from 9-12 weeks of pregnancy (58%) and average gestational age was 9.76 weeks of pregnancy. Majority of the procedures were done at private clinic (64%) but in government clinic , it was very rare (4%). Most of the abortion (36%) cases were induced by a Dai and by doctor (24%). Methods employed for inducing abortion, were curette (74%). The cardinal clinical presentations were bleeding per vaginum and foul smelling vaginal discharge were (60%) , abdominal pain (62%), fever (74%) and abdominal distension (22%).

In spite of the changing scenario as regards as regards health system in India in general and MCH care in particular, the incidence of septic abortions are not declining. Most common medical complications were severe anaemia i.e. _Hb<6 gm%_ comprises around (18%), followed by shock and septicaemia each were found to be 12% and renal failure (10%). Associated urinary tract infection was detected in 20% cases. E. Coli and Klebsiella aerogenes were predominant organisms isolated in urine culture. Conservative line of treatment were carried out in (28%) cases. Surgical treatment i.e. laparotomy were carried out in 42% of cases and each 6% of cases had both total and subtotal hysterectomy. Nine deaths (18%) occurred due to sepsis related complication.

References

Abstract:

Objective:

This study intends to assess the changes in the simple routine Coagulation Parameters in diabetes mellitus and to investigate whether any relationship exists among changes in these coagulation parameters and development of microvascular complication in diabetes mellitus.

Material and Method:

Period of study was from 2010-2012. It was done in M.K.C.G Medical College with the approval from Berhampur University. It is a case control study. 50 diabetic patients and 50 age and sex matched non-diabetic patients were randomly selected. Simple coagulation parameters like activated Partial Thromboplastin time (aPTT), Prothrombin time (PT), Serum fibrinogen, platelet count, plasminogen activator inhibitor 1 (PAI-1) were measured. Statistical Study was done using unpaired T-test and analysis and calculations were done using Graphpad software.

Result:

Serum fibrinogen was found to be increased in diabetic patients when compared to non-diabetic patients [Mean 278±26.9 v/s 232.52±16.5 P value – 0.009 significant]. PAI-1 levels was found to be higher among the diabetics with microvascular complications when compared to diabetic patient without microvascular complications. (285.28 ± 32.36 v/s 269.86 ± 13.08 P value 0.0449 statistically significant). PAI-1 levels was found to be higher among the diabetics with microvascular complications when compared to diabetic patient without microvascular complications. (285.28 ± 32.36 v/s 269.86 ± 13.08 P value 0.0449 statistically significant). PAI-1 levels was found to be higher among the diabetics with microvascular complications when compared to diabetic patient without microvascular complications. (285.28 ± 32.36 v/s 269.86 ± 13.08 P value 0.0449 statistically significant). PAI-1 levels was found to be higher among the diabetics with microvascular complications when compared to diabetic patient without microvascular complications. (285.28 ± 32.36 v/s 269.86 ± 13.08 P value 0.0449 statistically significant).

Comparison of diabetic patients with nephropathy and without nephropathy showed significant difference in fibrinogen and PAI-1 levels (292.39 ± 20.19 v/s 269.80 ± 24.43 P value 0.002 ; 53.67±7.59 v/s 43.62±7.31 P value<0.001 ). Comparison of diabetic patients with retinopathy and without retinopathy showed significant difference in fibrinogen levels (249.50 ± 27.19 v/s 286.13 ± 21.64 P value 0.0001). No significant difference was observed in the PAI-1 levels among the diabetics with retinopathy when compared to diabetics without retinopathy (48.01±6.95 v/s 47.55±9.30 The two-tailed P value is 0.8846, considered not significant). aPTT and, PT showed no significant difference in diabetic patients with and without microvascular complications.

Among 50 diabetic patients 24 had neuropathy, 20 had nephropathy and 10 had retinopathy, 21 had none of these complications. On comparing diabetic patients with microvascular complications and without microvascular complications, significant age difference was observed (59.55 ± 5.06 v/s 51.00 ± 3.31 P = 0.003). This probably was a reflection of increase in microvascular complications with increasing duration of diabetes. Serum fibrinogen was found to be increased among diabetic patients with microvascular complications when compared to diabetic patient without microvascular complications. (285.28 ± 32.36 v/s 269.86 ± 13.08 P value 0.0449 statistically significant). PAI-1 levels was found to be higher among the diabetics with microvascular complications when compared to diabetic patient without microvascular complications. (285.28 ± 32.36 v/s 269.86 ± 13.08 P value 0.0449 statistically significant).

1PG Student 2Professor, 3Assoc. Prof.
M.K.C.G. Medical College, Berhampur, Odisha
e-mail: dr_tity@yahoo.com
Submitted : 10.04.2013, Accepted : 30.04.2013
© OMJ 2014
Conclusion:

From this simple study it has been shown that diabetes mellitus is a procoagulant state. Hypercoagulability as evidenced by increased fibrinogen and hypofibrinolysis as evidenced by increased PAI-1 levels. Their levels are elevated in diabetic patients with microvascular complications when compared to those without. Though pathophysiology of microvascular complications not fully understood, it has been shown that there is significant coagulation abnormalities in diabetic patients with microvascular complications.

Introduction:

Diabetes mellitus, a common metabolic disorder characterised by hyperglycemia is a rapidly growing health problem. The worldwide prevalence of diabetes mellitus has risen dramatically over the past 2 decades. According to the statistics released by World Health Organisation (WHO) August 2011 showed 346 million people worldwide have diabetes. Diabetes increases the risk of heart disease and stroke. 50% of people with diabetes die of cardiovascular disease (primarily heart disease and stroke). Combined with reduced blood flow, neuropathy in the feet increases the chance of foot ulcers and eventual limb amputation. Diabetic retinopathy is an important cause of blindness, and occurs as a result of long-term accumulated damage to the small blood vessels in the retina. After 15 years of diabetes, approximately 2% of people become blind, and about 10% develop severe visual impairment. Diabetes is among the leading causes of kidney failure. 10-20% of people with diabetes die of kidney failure. Diabetic neuropathy is damage to the nerves as a result of diabetes, and affects up to 50% of people with diabetes. Although many different problems can occur as a result of diabetic neuropathy, common symptoms are tingling, pain, numbness, or weakness in the feet and hands. The overall risk of dying among people with diabetes is at least double the risk of their peers without diabetes. India has the highest number of diabetics worldwide. The International Diabetes Federation (IDF) estimates the total number of people in India with diabetes to be around 50.8 million in 2010, rising to 87.0 million by 2030.

Diabetes is the most common cause of blindness and end-stage renal disease and a major reason for peripheral neuropathy. Therefore, there is compelling reason to increase our knowledge about the cellular and molecular mechanisms of these complications so that rational strategies for prevention and treatment can be designed. Patients are considered to have a hypercoagulable state if they have laboratory abnormalities associated with increased risk of thrombosis. Many patients with diabetes mellitus fall into this category. Diabetics suffer from accelerated atherosclerosis too. Vascular endothelium, primary defense against thrombosis is abnormal in diabetes, which plays a role in enhanced activation of platelets and clotting factors seen in diabetes. Various mechanisms have been proposed for endothelial dysfunction. The entire coagulation cascade is dysfunctional in diabetes mellitus. Increased levels of fibrinogen and plasminogen activator 1 favour both thrombosis and defective dissolution of clots once formed. Several studies have shown abnormal platelet function in diabetes mellitus. Platelets in diabetic individual adhere to vascular endothelium and aggregate more readily than those of healthy people.

Diabetes is a procoagulant state. The pathophysiology of this procoagulant state is only poorly understood. This study intends to assess the changes in a few routine coagulation parameters in patients with diabetes mellitus and to investigate whether any relationship exists among changes in these parameters in the development of microvascular complications.

Materials And Methods:

In this study, 50 diabetic patients were selected as per the inclusion and exclusion criteria mentioned in the study protocol. Cases with diabetes mellitus was diagnosed as per the American diabetes association 2011 criteria for the diagnosis of diabetes mellitus. Diabetic nephropathy was diagnosed in the study population in those with diabetes mellitus having persistent proteinuria 500mg/24 hours or diabetic patients with microalbuminuria (Microalbuminuria is defined as protein excretion of 30-300 mg/day on at least 2 consecutive occasions) or overt proteiniuria i.e. albustix test positive in e 2 consecutive urine samples without urinary infection, cardiac disease or prostate disease were considered to have nephropathy. Diabetic neuropathy was diagnosed in the study population in those with diabetes mellitus having symptoms and signs of neuropathy i.e. any or combination of neuropathic
pain, distal sensory loss, motor weakness of isolated cranial nerve palsy, and autonomic symptoms such as orthostatic hypotension, abdominal bloating, constipation, diarrhoea, erectile dysfunction etc. Ewing's blood pressure tests were performed to detect cardiovascular autonomic neuropathy. These included blood pressure response to standing and sustained handgrip. Diabetic retinopathy was diagnosed on the basis of fundoscopic examination and fluorescein angiography.

Those patients receiving medications that would alter coagulation parameters, those suffering from liver disease, those patients who are suffering from genetic diseases like haemophilia, thrombophilia, von-Willebrand's disease and those people who are suffering from infectious disease like malaria and dengue fever were excluded as these diseases may alter the coagulation profile.

50 patients with diabetes mellitus who fulfilled the inclusion and exclusion criteria were taken as the cases. Another 50 age and sex matched patients without diabetes mellitus and those who fulfilled the exclusion criteria were taken as the controls. From this study population baseline demographic data was collected and detailed physical examination was performed. Full routine blood investigation were done. Special investigations like prothrombin time, activated partial thromboplastin time, serum fibrinogen level and plasminogen activator inhibitor-1 were measured. Study population was divided into cases and controls. Cases were again divided into diabetic patients with microvascular complication and those without microvascular complication. Cases were divided into diabetic patients with neuropathy and without neuropathy, with nephropathy and without nephropathy, with retinopathy and without retinopathy. Statistical analysis was done to assess the association of these coagulation parameters (1) between cases and controls (2) between diabetic patients with microvascular complication and without microvascular complication (3) between diabetic patients with neuropathy and without neuropathy (5) between diabetic patients with nephropathy and without nephropathy (6) between diabetic patients with retinopathy and without retinopathy.

Among the 50 cases in the study group 29 patients had microvascular complication of diabetes mellitus as per the criteria mentioned in the study protocol. 21 cases had no microvascular complication of diabetes mellitus. Among the diabetic patients with microvascular complications 6 patients had retinopathy, nephropathy and neuropathy. 11 patients had neuropathy and nephropathy. 2 patients had both retinopathy and nephropathy. 5 patients had only neuropathy. 3 patients had only nephropathy. 2 patients had only retinopathy. 50 age and sex matched non-diabetic patients were taken as the control population. Among the 29 cases in the study group with diabetic microvascular complication 16 were males and 13 were females. Among the 21 cases without diabetic microvascular complication 12 were males and 9 were females.

For coagulation and fibrinolysis, 7ml blood sample was collected in special tubes containing 3.2% sodium citrate. PT and aPTT were estimated by standard methods as described by Dacie and Lewis. Serum fibrinogen levels were measured by Clauss method. PAI-1 was measured using AssayMax Human Plasminogen Activator Inhibitor-1 (PAI-1) ELISA Kit. Comparative analysis was done using unpaired student T-test. Statistical analysis was done using graphpad software.

Results:

In comparison between the 50 diabetic patients and 50 non-diabetic patients there was no significant difference between the age distribution among the subjects (55.96±6.11 v/s 55.90±6.23 P value is 0.9613, considered not significant); there was no significant difference between the prothrombin time among the subjects (13.16±0.52 v/s 13.05±0.49 two-tailed P value is 0.2812, considered not significant); there was no significant difference between the aPTT among the subjects (33.041±1.317 v/s 32.994±1.298 P value is 0.8589, considered not significant). Serum fibrinogen level was found to be higher among the diabetic patients when compared to non diabetic patients (278±26.975 v/s 261.38±20.637; The two-tailed P value is 0.0005, considered extremely significant). PAI-1 levels was found to be higher among the diabetics when compared to non-diabetics (47.64±8.82 v/s 31.06±7.12 The two-tailed P value is < 0.0001, considered extremely significant). The platelet count though it was within
normal limits was found to be decreased in diabetic patients (2.257±0.134 v/s 2.339±0.2129 P value is 0.0220, considered significant).

In comparison between the 29 diabetic patients with microvascular complications and 21 diabetic patients without microvascular complications mean age was found to be higher among the diabetic patients with microvascular complications (59.55±5.06 v/s 51.00±3.31 P value is < 0.0001, considered extremely significant); there was no significant difference between the prothrombin time among the two groups (13.12±0.51 v/s 13.21±0.55 two-tailed P value is 0.5420, considered not significant); serum fibrinogen level was found to be higher among the diabetic patients with microvascular study (285.28±32.36 v/s 269.86±13.08; The two-tailed P value is 0.0094, considered very significant); PAI-1 levels was found to be higher among the diabetics with microvascular complications when compared to diabetics without microvascular complications (52.34±7.40 v/s 41.12±6.31 The two-tailed P value is < 0.0001, considered extremely significant). Serum fibrinogen level was found to be higher among the diabetic patients with microvascular complications when compared to diabetic patients without microvascular complications (285.28±32.36 v/s 269.86±13.08; The two-tailed P value is 0.0449, considered significant). PAI-1 levels was found to be higher among the diabetics with microvascular complications when compared to diabetics without microvascular complications (52.34±7.40 v/s 41.12±6.31 The two-tailed P value is < 0.0001, considered extremely significant).

In comparison between the 24 diabetic patients with neuropathy and 26 diabetic patients without neuropathy mean age was found to be higher among the diabetic patients with neuropathy (59.96±4.58 v/s 55.27±4.94 P value is < 0.0001, considered extremely significant); there was no significant difference between the prothrombin time among the two groups (13.14±0.52 v/s 13.16±0.54 two-tailed P value is 0.8540, considered not significant); Serum fibrinogen level was found to be higher among the diabetic patients with neuropathy when compared to diabetic patients without neuropathy (292.30±20.19 v/s 269.80±27.44 The two-tailed P value is 0.0029, considered very significant). PAI-1 levels was found to be higher among the diabetics with neuropathy when compared to diabetics without neuropathy (53.67±7.59 v/s 43.62±7.31 The two-tailed P value is < 0.0001, considered extremely significant).

In comparison between the 20 diabetic patients with nephropathy and 24 diabetic patients without nephropathy mean age was found to be higher among the diabetic patients with nephropathy (60.30±5.22 v/s 53.16±4.86 P value is < 0.0001, considered extremely significant); there was no significant difference between the prothrombin time among the two groups (13.08±0.55 v/s 13.21±0.51 two-tailed P value is 0.4053, considered not significant); no significant difference in the platelet count was observed (2.45±0.92 v/s 2.26±0.14 P value is 0.6835, considered not significant). Serum fibrinogen level was found to be higher among the diabetic patients with nephropathy when compared to diabetic patients without nephropathy (53.67±7.59 v/s 43.62±7.31 The two-tailed P value is < 0.0001, considered extremely significant).

In comparison between the 10 diabetic patients with retinopathy and 40 diabetic patients without retinopathy in the study population no significant was found in the mean age of 2 groups (57.9±4.07 v/s 55.47±6.47 P value is 0.2660, considered not significance); there was no significant difference between the prothrombin time among the two groups (12.98±0.55 v/s 13.20±0.51 P value is 0.2362, considered not significant); there was no significant difference between the aPTT also (33.54±0.69 v/s 32.92±1.42 P value is 0.1827, considered not significant). No significant difference in the platelet count was observed (2.29±0.12 v/s 2.24±0.14 The two-tailed P value is 0.2910, considered not significant). Serum fibrinogen level was found to be higher among the diabetic patients with retinopathy when compared to diabetic patients without retinopathy (286.13±21.64 v/s 249.5±27.19 P value is < 0.0001, considered extremely significant).
extremely significant). No significant difference in the PAI-1 levels was found among the diabetics with retinopathy when compared to diabetics without retinopathy (48.01±6.95 v/s 47.55±9.30 The two-tailed P value is 0.8846, considered not significant). 

Analysis of Parameters Among The Cases (Diabetic Patients) and Controls (non-diabetic Patients)

Table (1)

Comparison of Parameters Between Diabetic Patients with Microvascular Complications and without Microvascular Complications

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>DIABETIC PATIENTS WITH MICROVASCULAR COMPLICATIONS</th>
<th>DIABETIC PATIENTS WITHOUT MICROVASCULAR COMPLICATIONS</th>
<th>P value</th>
<th>SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO: OF SUBJECTS</td>
<td>29</td>
<td>21</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SEX M/F</td>
<td>16 / 13</td>
<td>12 / 9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HbA1C</td>
<td>8.05±0.47</td>
<td>7.17±0.36</td>
<td>&lt;0.001</td>
<td>S</td>
</tr>
<tr>
<td>AGE</td>
<td>59.55±5.06</td>
<td>51.00±3.31</td>
<td>&lt;0.001</td>
<td>S</td>
</tr>
<tr>
<td>SERUM FIBRINOGEN</td>
<td>285.28±32.36</td>
<td>269.86±13.08</td>
<td>0.044</td>
<td>S</td>
</tr>
<tr>
<td>PROTHROMBIN TIME</td>
<td>13.12±0.51</td>
<td>13.21±0.55</td>
<td>0.54</td>
<td>NS</td>
</tr>
<tr>
<td>ACTIVATED PARTIAL THROMBOPLASTIN TIME</td>
<td>33.03±1.48</td>
<td>33.06±1.07</td>
<td>0.93</td>
<td>NS</td>
</tr>
<tr>
<td>PLATELET COUNT</td>
<td>2.23±0.15</td>
<td>2.29±0.098</td>
<td>0.02</td>
<td>S</td>
</tr>
<tr>
<td>PAI-1</td>
<td>52.34±7.40</td>
<td>41.12±6.31</td>
<td>&lt;0.001</td>
<td>S</td>
</tr>
</tbody>
</table>

Table (2)
Analysis of Parameters Among Diabetic Patients with Neuropathy and without Neuropathy.

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>DIABETIC PATIENTS WITH NEUROPATHY</th>
<th>DIABETIC PATIENTS WITHOUT NEUROPATHY</th>
<th>P value</th>
<th>SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO: OF SUBJECTS</td>
<td>24</td>
<td>26</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SEX M/F</td>
<td>14/10</td>
<td>14/12</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AGE</td>
<td>59.96±4.58</td>
<td>55.27±4.94</td>
<td>&lt;0.001</td>
<td>S</td>
</tr>
<tr>
<td>SERUM FIBRINOGEN</td>
<td>288.92±26.43</td>
<td>269.46±24.39</td>
<td>0.009</td>
<td>S</td>
</tr>
<tr>
<td>PROTHROMBIN TIME</td>
<td>13.14±0.52</td>
<td>13.16±0.54</td>
<td>0.85</td>
<td>NS</td>
</tr>
<tr>
<td>ACTIVATED PARTIAL THROMBOPLASTIN TIME</td>
<td>32.94±1.49</td>
<td>33.13±1.298</td>
<td>0.61</td>
<td>NS</td>
</tr>
<tr>
<td>PLATELET COUNT</td>
<td>2.20±0.14</td>
<td>2.30±0.11</td>
<td>0.009</td>
<td>S</td>
</tr>
<tr>
<td>PLASMINOGEN ACTIVATOR INHIBITOR -1</td>
<td>52.86±7.87</td>
<td>42.83±6.85</td>
<td>&lt;0.001</td>
<td>S</td>
</tr>
</tbody>
</table>

Table (3)

Analysis of Parameters Among Diabetic Patients with Nephropathy and Without Nephropathy.

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>DIABETIC PATIENTS WITH NEPHROPATHY</th>
<th>DIABETIC PATIENTS WITHOUT NEPHROPATHY</th>
<th>P value</th>
<th>SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO: OF SUBJECTS</td>
<td>20</td>
<td>30</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SEX M/F</td>
<td>11/9</td>
<td>18/12</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AGE</td>
<td>60.30±5.22</td>
<td>53.16±4.86</td>
<td>&lt;0.001</td>
<td>S</td>
</tr>
<tr>
<td>SERUM FIBRINOGEN</td>
<td>292.30±20.19</td>
<td>269.80±27.44</td>
<td>0.002</td>
<td>S</td>
</tr>
<tr>
<td>PROTHROMBIN TIME</td>
<td>13.08±0.55</td>
<td>13.21±0.51</td>
<td>0.40</td>
<td>NS</td>
</tr>
<tr>
<td>ACTIVATED PARTIAL THROMBOPLASTIN TIME</td>
<td>32.74±1.63</td>
<td>33.24±1.04</td>
<td>0.19</td>
<td>NS</td>
</tr>
<tr>
<td>PLATELET COUNT</td>
<td>2.45±0.92</td>
<td>2.26±0.14</td>
<td>0.68</td>
<td>NS</td>
</tr>
<tr>
<td>PLASMINOGEN ACTIVATOR INHIBITOR -1</td>
<td>53.67±7.59</td>
<td>43.62±7.31</td>
<td>&lt;0.001</td>
<td>S</td>
</tr>
</tbody>
</table>

Table (4)
Analysis of Parameters Among Diabetic Patients with Retinopathy and Without Retinopathy

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>DIABETIC PATIENTS WITH RETINOPATHY</th>
<th>DIABETIC PATIENTS WITHOUT RETINOPATHY</th>
<th>P value</th>
<th>SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO: OF SUBJECTS</td>
<td>10</td>
<td>40</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SEX M/F</td>
<td>5 / 5</td>
<td>22 / 18</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AGE</td>
<td>57.9±4.07</td>
<td>55.47±6.47</td>
<td>0.26</td>
<td>NS</td>
</tr>
<tr>
<td>SERUM FIBRINOGEN</td>
<td>286.13±21.64</td>
<td>249.5±27.19</td>
<td>&lt;0.001</td>
<td>S</td>
</tr>
<tr>
<td>PROTHROMBIN TIME</td>
<td>12.98±0.55</td>
<td>13.20±0.51</td>
<td>0.23</td>
<td>NS</td>
</tr>
<tr>
<td>ACTIVATED PARTIAL THROMBOPLASTIN TIME</td>
<td>33.54±0.69</td>
<td>32.92±1.42</td>
<td>0.18</td>
<td>NS</td>
</tr>
<tr>
<td>PLATELET COUNT</td>
<td>2.29±0.12</td>
<td>2.24±0.14</td>
<td>0.29</td>
<td>NS</td>
</tr>
<tr>
<td>PLASMINOGEN ACTIVATOR INHIBITOR -1</td>
<td>48.01±6.95</td>
<td>47.55±9.30</td>
<td>0.88</td>
<td>NS</td>
</tr>
</tbody>
</table>

Discussion:

In comparison between the diabetic patients with microvascular complications and diabetic patients without microvascular complications mean age was found to be higher among the diabetic patients with microvascular complications (59.55±5.06 v/s 51.00±3.31 P value is < 0.0001, considered extremely significant). This probably was a reflection of increase in complications with increasing duration of diabetes. In my study the platelet count though it was within normal limits was found to be decreased in diabetic patients (2.257±0.134 v/s 2.339±0.2129 P value is 0.0220, considered significant). This is comparable with the study done by Ritu Madan et al in Safdarjarg Hospital.

Serum fibrinogen level was found to be higher among the diabetic patients when compared to non diabetic patients. Serum fibrinogen level was found to be higher among the diabetic patients with microvascular complications when compared to diabetic patients without microvascular complications. Serum fibrinogen level was found to be higher among the diabetic patients with neuropathy when compared to diabetic patients without neuropathy. Serum fibrinogen level was found to be higher among the diabetic patients with nephropathy when compared to diabetic patients without nephropathy. In the study done on the coagulation profile in diabetes mellitus by Ritu Madan et al in Safdarjarg Hospital, India also found similar results. In the study done by Shihabi ZK et al the mean plasma level of fibrinogen in the type II diabetics was higher than that of the normal population. In the study done by by Miles R et al found significant increase in the serum fibrinogen in diabetic patients with nephropathy when compared to diabetic patients without nephropathy. In the study done by Dr Kafle and P Shrestha found significant higher serum fibrinogen levels in patients with diabetes mellitus in comparison to normal population. According to study done by Demirci Huseyin et al titled “Association Between Serum Fibrinogen Levels and Diabetic Microvascular Complications in Type 2 Diabetes Mellitus .” The plasma fibrinogen levels were significantly higher in patients with retinopathy and/or nephropathy than in...
patients without these complications but not significantly higher in patients with neuropathy than in patients without neuropathy. In the study done by Hideki Asakawa et al titled Elevation of fibrinogen and thrombin–antithrombin III complex levels of type 2 diabetes mellitus patients with retinopathy and nephropathy found that fibrinogen levels were significantly higher in patients with retinopathy or nephropathy than in patients without these complications. These studies gave results which are comparable with our study.

In my study PAI-1 levels was found to be higher among the diabetics when compared to non-diabetics indicating decreased fibrinolysis in diabetics. PAI-1 levels was found to be higher among the diabetics with microvascular complications when compared to diabetics without microvascular complications. PAI-1 was also found to be higher in diabetic patients with neuropathy and nephropathy. PAI-1 was not raised in diabetic patients with retinopathy when compared to those without. This may be due to small sample size of the diabetic patients with retinopathy. In the study done on the coagulation profile in diabetes mellitus by Ritu Madan et al in Safdarjang Hospital, India also found similar results. PAI-1 levels were increased in diabetics as compared to controls. PAI-1 was raised in diabetic patients with complications compared to those without complications and again the difference was statistically significant. In the study done by A. Pandolfi et al Plasma plasminogen activator inhibitor type 1 (PAI-1) increases in diabetes. In the study done by Galajda P et al elevated serum levels of fibrinogen (mean ± SD; 287.8 ± 58.8 vs. 275.1 ± 56.0 mg/dl; P = 0.013) and PAI-1 (24 [15, 37.5] vs. 16 ng/ml [9, 27]; P = 0.0001) in diabetes mellitus type II.

In my study there was no significant difference between the prothrombin time (13.16±0.52 v/s 13.05±0.49 two-tailed P value is 0.2812, considered not significant) ; aPTT between the diabetic and nondiabetic patients subjects (33.041±1.317 v/s 32.994±1.298 P value is 0.8589, considered not significant ). In the study done on the coagulation profile in diabetes mellitus by Ritu Madan et al in Safdarjang Hospital, India also found similar results. In the study done by Oo Alao et al Prothrombin time (PT) of diabetic subjects (15.7 ± 2.1) was significantly prolonged compared to that of non diabetic controls (14.9 ± 2.3) even though the values were within normal limits. Partial thromboplastin time (APTT) in the diabetic subjects was significantly prolonged than that of controls (P < 0.005), although within normal limits.

Conclusion:

My study was on the coagulation profile in diabetes mellitus and the aim of the study was to investigate whether any association between the hemostatic abnormalities and diabetic microvascular complications. From my study, I found that the age was significantly higher among the diabetic patients with microvascular complications when compared to those without. The microvascular complications were present in diabetic patients with poor glycemic control. this is evident by higher levels of glycosylated haemoglobin (HbA1c) between these two groups. There was no significant difference in the PTT and APTT in diabetic patients and non-diabetic patients and also diabetic patients with microvascular complications when compared to those without. It has been shown that diabetes is a procoagulant state. The pathophysiology of this procoagulant state is partially understood. Hypercoagulability as evidence by increased fibrinogen levels and hypofibrinolysis as evidenced by increased PAI-1 levels contribute to procoagulant state observed in diabetes. This procoagulant state not only contributes to major vessel diseases but also contributes to microvascular complications as has been observed in this study. This is evidenced by significant increase in fibrinogen level in diabetic patients with neuropathy, nephropathy and retinopathy; and also by increased PAI-1 levels in neuropathy and nephropathy.

References:

1. Coagulation profile in diabetes mellitus and its association with microvascular complications- Ritu Madan , B Gupta , Sumita Saluja , UC Kansra , BK Tripathi , BP Guliani. JAPI • august 2010 • VOL. 58


20. Haemostatic Profile of Patients with Type 2 Diabetes Mellitus in Northern Nigeria. The Internet Journal of Endocrinology ISSN: 1540-2606.
A comparative study between Manual vacuum aspiration and electrical vacuum aspiration for first trimester MTP
S.K. Samal¹, M. Padhi², S. Rathod¹, S. Jajodia¹

Abstract:

Aims & Objectives: The aim of the study is to compare Manual Vacuum Aspiration (MVA) and Electrical Vacuum Aspiration (EVA) as the method for 1st trimester MTP in terms of efficacy, blood loss, duration, acceptability and complications. The study also compares paracervical block (PCB) and IM sedation (IMS) i.e. inj. Pentazocin 30 mg. and inj. Promethazine 25 mg. as preoperative analgesia for both of these MTP procedure.

Method: The present study was conducted in the Post partum centre & department of Gynaecology and Obstetrics, SCB Medical College, Cuttack. A total number of 200 patients were studied; out of which 100 patients underwent MVA and remaining 100 EVA. Cases were compared with respect to age, parity, blood loss, time taken and complications.

Results: In the present study MVA was effective in 97% and EVA in 98% cases as 2% and 3% respectively of the 2 groups required reevacuation for incompleteness. Thus the two procedures did not show much difference as far as their effectiveness was concerned. Comparing intra & post operative pain, Paracervical block was significantly effective in reducing pain as compared to Intramuscular sedation.

Conclusion: MVA has a safety and efficacy profile similar to that of EVA. Also, MVA is a simple, safe, effective procedure, portable and low cost technique. Hence, MVA is a promising method compared to EVA and can be practiced widely in rural areas where the access to medical facilities are limited, high tech equipments are not available, power supply erratic and maintenance of instruments not up to the mark. The judicious use of MVA comes with a promise to make early abortions safe and easily accessible to women of both rural and urban societies belonging to any socioeconomic strata.

Key words: Manual vacuum aspiration, Electrical vacuum aspiration, abortion, paracervical block

Introduction

Unsafe abortion is a neglected women’s health issue in India and in many developing nations because maternal mortality and morbidity due to unsafe abortions can easily be prevented when women have access to safe abortion services¹. Unsafe abortion is defined by the World Health Organization (WHO) as “a procedure for terminating an unwanted pregnancy either by persons lacking the necessary skills or in an environment lacking the minimal medical standards, or both” (WHO 1992)². Worldwide, 42 million pregnancies each year end in abortion, with 19.7 million of these abortions taking place under unsafe conditions; nearly all unsafe abortions (95%) occur in developing countries (WHO 2007)³.

The WHO has explained that almost all abortion related deaths are preventable when performed by a qualified provider using correct techniques under sanitary conditions (WHO 2003)⁴.

In this study we examine the safety and efficacy of Manual vacuum aspiration (MVA) over that of EVA. Looking for a safer device, that could be placed in the hands of a P.H.C. medical officer or even a lady health visitor, the MVA technique has evolved. It’s working principle is the same as EVA. It carries not only chances of less blood loss, pain, and injuries but also the great advantage of being operated manually and thus can be performed in area where there is less or no electricity. It is a low tech procedure hence can be operated by primary health care providers. The present study compares MVA and EVA as the method for 1st trimester MTP in terms of efficacy, blood loss, duration, acceptability and complications.
Methods

The study was conducted in the Postpartum centre & Department of Gynaecology and Obstetrics, Cuttack. A total number of 200 patients were studied; out of which 100 patients underwent MVA and remaining 100 EVA. Patient selection and type of analgesia used was done randomly. Types of analgesia used were Paracervical block (5 ml Lignocaine 0.5%) and Intramuscular injection of Pentazocin 30 mg. and inj. Promethazine 25 mg.

Exclusion criteria:
1. Gestational age >12 week
2. Spontaneous abortion
3. Uterine malformation
4. Associated fibroid uterus
5. Suspected molar pregnancy
6. Missed abortion
7. Previous Caesarean section
8. Other pelvic pathology like PID & Endometriosis

Preliminary investigations done were haemoglobin estimation and blood grouping and Rh typing. In both the procedures informed written consent was taken and patient counselling was done.

In MVA 1) Vacuum was created in 60mL double valve MVA syringe i.e. the syringe was charged. 2) The uterus was re-evaluated by bimanual examination. 3) The size of the cannula was selected (varying from 4mm-12mm) to snugly fit in the cervical canal. 4) Using no touch technique, the cannula was inserted through the cervix towards the fundus. 5) The charged syringe was attached to the cannula and the pinch valves released allowing the vacuum to get transferred to the uterine cavity. 6) Contents of the uterus were evacuated by using rotatory or back and forth movements of the cannula. 7) Appearance of red-pink foam or bubbles, absence of more products getting aspirated, a gritty sensation as the cannula passes over the uterine walls, and a feel of the uterus contracting around the cannula were considered as signs of completeness of the procedure.

In EVA 1) The uterus was re-evaluated by bimanual examination. 2) Various parts of aspiration apparatus were connected in a way that they form a continuous system: i.e. one plastic pipe was connected from flask to the electric pump and another was connected from flask to the aspiration cannula. 3) The electric pump was set in action and the vacuum was read on the pressure gauge. 4) The negative pressure was set in the range of 0.4-0.8 kg/m2. 5) Cervical dilatation done in almost all cases. 6) Aspiration cannula chosen and passed gently through the cervical canal and into the endometrial cavity. 7) The system was started and in few minutes the products of conception were aspirated into the aspiration flask. 8) The cannula was turned around 180 degree on its longitudinal axis and to and fro movement. It was taken out once or twice, allowing the aspirated air to compress the material through the connecting pipes into the aspirated flask. 9) Signs of completion are similar as in manual vacuum aspiration.

The evacuated material was sent for histopathological study; inspected for chorionic villi and also the amount of blood loss & total time taken were estimated in both the groups. Intra and post-operative pain was assessed by Visual Analog Scale (VAS).

Patients were discharged after 4 hours of observation, after advising oral antibiotics and analgesic. Those who underwent laparoscopic tubal ligation with MVA/EVA were also discharged after 4 hours. All the patients were asked to come for follow up after 1 week and were given family planning advice.

Result and analysis

Demographic & Baseline Parameters: The baseline data in both MVA & EVA were compared to see if both the groups were identical.

Table 1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MVA (n=100)</th>
<th>EVA (n=100)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>27.7 ± 4.75</td>
<td>28.31 ± 4.73</td>
<td>0.422</td>
</tr>
<tr>
<td>Rural/Urban</td>
<td>59/41(%)</td>
<td>63/37(%)</td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>10%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>SES (Low)</td>
<td>39%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Gravida/Para</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primi/Multi</td>
<td>32/68(%)</td>
<td>28/72(%)</td>
<td>0.635</td>
</tr>
<tr>
<td>Mean Gestational</td>
<td>8.16 ± 2.02</td>
<td>8.10 ± 1.977</td>
<td>0.832</td>
</tr>
<tr>
<td>Age (in weeks)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 shows that majority of the patients is both study groups were in the age group of 20-29
years. Kamel H. et al. in 2011 also reported that majority of cases were in the age group of 20-30 years. Westfall John M. et al. also reported that majority of the MTP seekers were from 20-29 years age group (63.6%). Multiparous women constituted maximum number of patients in both the study groups. Kamel H et al. in 2011 reported that majority i.e. 90.5% cases were multiparous. All the cases were married women admitted for 1st trimester MTP. The median gestational age was 8-10 weeks for both procedures in this study. Westfall et al. studied MVA on 1677 patients where majority were up to 10 weeks gestation with only 10 patients i.e. 0.6% between 10-12 weeks.

Parameters Studied

<table>
<thead>
<tr>
<th>Table-2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>  MVA(n=100)</td>
<td>  EVA(n=100)</td>
</tr>
<tr>
<td>Mean time required</td>
<td>8.69 ± 2.44</td>
</tr>
<tr>
<td>For the procedure</td>
<td> </td>
</tr>
<tr>
<td>Mean blood loss in ml</td>
<td>40.21 ± 10.73</td>
</tr>
<tr>
<td>Hospital stay in hrs.</td>
<td>4.05 ± 0.219</td>
</tr>
</tbody>
</table>

Patient Satisfaction

<table>
<thead>
<tr>
<th>  Satisfied</th>
<th>  Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>92%</td>
<td>8%</td>
</tr>
<tr>
<td>88%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Table-3

| Distribution of study subjects according to gestational age(weeks) and time taken in minutes: |
|---|---|
| &nbsp; Gestational Age in weeks | &nbsp; MVA | &nbsp; EVA | No. | p value |
| Mean | Mean | No. | Mean | Mean |
| time | time | p value | time | time |
| taken | taken | | minutes | minutes |
| 6-8 | 34 | 6.1 | 34 | 6.47 | >0.05 |
| 8-10 | 53 | 9.5 | 54 | 7.8 | <0.005 |
| &nbsp; Total | 13 | 12.3 | 12 | 11.3 | <0.005 |

Table-2 & 3 shows the mean time required for the MVA procedure was 8.69 ± 2.444 and that for EVA was 7.77 ± 1.830 for EVA with p value 0.003, which is statistically significant. Mean time taken in each gestational group was calculated and compared. p value for 6-8 weeks gestational age is 0.322 which is not statistically significant, but for 8-10 weeks and 10-12 weeks gestational age the p values are <0.003 which is statistically significant. Time consumed in repeated emptying of MVA syringe in higher gestational period due to its limited capacity of 60 ml may be a contributing factor for increased time consumption in this procedure. The operating time for MVA was significantly longer than EVA. Similar observations were made by Wen J et al. in BJOG 2007 in the meta analysis of 10 studies with a gestational age of less than 50 days and by Nasira Tasnim et al. in 2011 (Operating time (min) mean ± SD 10.71±2.770 for MVA & 9.59±2.880 for EVA, p value < 0.01).

The mean blood loss is 40.21 ± 10.73 ml in MVA vs. 44.88 ± 11.29 ml in EVA group. This is not clinically important as both the procedures are associated with very low blood loss but it is statistically significant with p value <0.003. There was no case of major haemorrhage requiring blood transfusion. In MVA group increased bleeding(>60 ml) was observed in 5 cases which belonged to 10-12 weeks GA where as in EVA group, 3 cases from 8-10 weeks and 4 cases from 10-12 weeks had increased bleeding during the procedure. Similar observation were made by Goldberg et al. who found that although blood loss was apparently lower with MVA, the difference between estimated blood loss of 35 ml and 42 ml was not clinically important and both procedures were associated with very low blood loss i.e. 35.4 ± 16.8 ml and 41.6 ± 18.2 ml. However their p value was <0.001 which was statistically significant. Nasira Tasnim et al. in 2011 found that the mean ± SD blood loss was 62.08±32.190 in MVA and 75.71±35.532 in EVA ,the P value being < 0.008.

The mean hospital stay in this study in hours is 4.05 ± 0.219 for MVA and 4.64 ± 0.785 for EVA with p value <0.0001 which is highly significant. Similar observation by Nasira Tasnim et al. in 2011 who found that the mean hospital stay was significantly shorter in MVA group 12.26 ±6.97 hrs Vs 19.54±7.59 hrs in EVA group.

Table-2 shows women’s reports of overall satisfaction when assessed at their follow up visits. 90 %(92% in MVA Vs 88% in EVA) of women indicated that they were satisfied with their experience, would chose the same method again and would recommend
it to a friend. 8 % in MVA & 12 % in EVA group were unsatisfied with the procedure used with p value=0.816. Hence there is no significant difference in satisfaction reported by the cases in both the procedures. 8 % of cases in MVA and 10 % of cases in EVA group reported pain as the cause of unsatisfaction with p value =0.816 which is statistically insignificant. However none in MVA Vs 12 % cases in EVA group reported noise botheration as the cause of unsatisfaction with p value=0.03 which is statistically significant. Similar results by Wen J et al in 2007 reported that there were no statistical differences for participants’ satisfaction with the method of MVA versus EVA and participants’ preference. Dean G et al 10 in 2003 reported that there were no significant differences in pain levels or satisfaction reported by patients; however, significantly more women in the electric group were bothered by noise (19% vs. 2%, p = 0.03). DS Milingos et al 11 in 2009 reported high acceptability of the procedure and 98% of women were satisfied with the procedure.

Anaesthesia/analgesia given

| Table-4 |
| PARACERVICAL BLOCK (PCB) IM SEDATION (IMS) p value |
| MV/EA | 51%/53% | 49%/47% | 0.777 |
| Intra-op | No pain | 78.8% | 51% | <0.0001 |
| Post-op | No pain | 93.3% | 62.5% | <0.0001 |

Table-4 shows out of the 200 study subjects, pre operative analgesia in the form of Paracervical block or IM sedation was given randomly. Paracervical block was given in 52% of cases and IM sedation in 48 % of cases with P value=0.777. Hence the differences between both the groups are statistically insignificant. Intra operatively majority i.e. 65.5% (78.88% in PCB Vs 51% in IMS) reported no pain. Applying Pearson chi-square (x²)test the P value<0.0001. Hence the differences between both the groups are statistically highly significant. In Postop period 93.3 % in PCB Vs 62.5 % in IMS reported no pain with P value<0.0001 which is also highly significant. Tekle G et al 12 in 2002 reported about pain relief using Paracervical nerve block with 1% lignocaine injection in patients undergoing uterine evacuation by MVA for incomplete abortion. The untreated group experienced significantly more pain than the treated group, especially lower abdominal pain and backache.

Table-5

Distribution of study subjects according to complication

<table>
<thead>
<tr>
<th>COMPLICATION</th>
<th>MVA</th>
<th>EVA</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. During procedure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Increased bleeding</td>
<td>0</td>
<td>3</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>b. Uterine perforation</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>c. Cervical injury</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>d. Vasovagal attack</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>II. During follow up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Pain abdomen</td>
<td>2</td>
<td>4</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>b. Excess bleeding</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>c. Incomplete evacuation</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>7</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Table-5 demonstrates that the complications during the procedure are rare except for 3 cases of increased bleeding and one case of vasovagal attack in EVA group. There was no case of major haemorrhage requiring blood transfusion. There was no major complication during the procedure in MVA group. Applying Pearson’s chi-square test, the p value >0.05, which is not statistically significant.

During follow up at 7 days, lower abdominal pain(6 cases) was the commonest complaint, noted in both procedures followed by increased bleeding(4 cases) which was found more in association with those who had immediate Cu-T insertion. The p value >0.05 which is statistically insignificant. Goldberg AB et al 9 in 2004 comparing MVA and EVA for first trimester abortion reported that there was overall, no difference in rate of uterine re-aspiration with MV A or EV A. Helen Kamel et al in 2011 5 reported that there was no significant difference in complication.

Incomplete evacuation was noted in both procedures for which re-exploration and evacuation had to be done. 3% of MVA and 2% of EVA had incomplete evacuation (p value >0.05 is statistically insignificant). In the present study MVA was effective in 97% and EVA in 98% cases as 3% and 2%
respectively of the 2 groups required re-evacuation for incompleteness. Thus the two procedures did not show much difference as far as their effectiveness is concerned.

Conclusion:

In the present study MVA was superior in terms of significantly less blood loss and shorter hospital stay. Intra and post operative pain assessment by visual analogue score (VAS) showed significant difference with type of preoperative analgesia used. Based on the finding of this study, any patient undergoing vacuum aspiration for 1st trimester MTP should be given Paracervical block as it is cost effective, easy to perform and with less side effects. There was no significant difference in complication rates in both the procedures. In the present study, MVA was effective in 97% and EVA 98% cases, thus the two procedure did not show much difference as far as their effectiveness is concerned.

Manual vacuum aspiration is a safe and effective alternative to traditional electric vacuum aspiration. It is also relatively easy to perform and requires simple training for the health care provider. The manual aspiration equipment is inexpensive. Its simplicity of use and the proof that MVA has a safety and efficacy profile similar to that of EVA, could increase the number of physicians who offered abortions to their patients. Another important aspect is that MVA is a simple, safe effective procedure. Its portability and low cost make it a technique best suited for the infrastructure in rural areas. MVA is a promising method compared to EVA which can be practiced widely in rural areas where the access to medical facilities are limited, high tech equipments are not available, power supply erratic and maintenance of instruments not up to the mark. The judicious use of MVA comes with a promise to make early abortions safe and easily accessible to women of both rural and urban societies belonging to any socioeconomic strata.

References:

Aim: To estimate levels of vitamin D [25 (OH) vitamin D] in a group of type 2 Diabetes Mellitus patients and another group of healthy controls and to see if a significant difference existed in the two groups of population.

Material and methods: This was a case control study which included 98 type 2 diabetes patients(cases) and 50 controls. fasting blood sugar, PPBS and serum 25(OH) vitamin D was estimated in both cases and controls.

Results and discussion: Mean serum Vitamin D in cases and control was 15.17 ±9.0 ng/ml and 19.65 ± 9.52 ng /ml respectively. A t-test comparing these two groups was significant (P =0.0057). This study finds a significant statistical difference between vitamin D levels between the two groups.

Conclusion: This finding reaffirms the conclusion derived from previous studies worldwide that vitamin D deficiency could play a role in causation of Type 2 diabetes mellitus. This could highlight ways to ameliorate the deficiency of this nutrient so as to prevent further rise in the epidemic of diabetes mellitus.

Introduction: The world today is witnessing an epidemic of Diabetes Mellitus. Diabetes mellitus (DM) is a metabolic disorder that has assumed epidemic proportions with India being designated as the diabetic capital. The World Health Organisation (WHO) estimates that there are currently 220 million cases of Diabetes mellitus worldwide. In 2010, 45.5 million people in India had Diabetes Mellitus. By 2020, this would increase to 69.7 million. India is the second most populous country in the world with the largest number of cases of Diabetes mellitus.

DM is a chronic disorder with multiorgan involvement having many microvascular and macrovascular complications. Cardiovascular disease is the leading cause of death in individuals with DM. If glycaemic control is not attained in early stages of the disease, the complications could be many resulting in significant morbidity and mortality.

With such a background it becomes important to understand the pathogenicity of this disease so as to prevent its alarming rise rather than wait to initiate treatment once the insult has set in. Genetic factors and environmental factors such as sedentary lifestyle, physical inactivity, obesity etc. contribute towards its onset. Of late, many studies have demonstrated an increased association of DM with Vitamin D deficiency. In India not many such studies have been reported so far. This study was undertaken so as to see if Vitamin D deficiency is a causative factor in the pathogenesis of type 2 DM.

Vitamin D, a secosteroid that is synthesized in skin and sequentially metabolized in liver and kidneys in humans, has been well-known for its function in maintaining calcium and phosphorus homeostasis and promoting bone mineralization. However, the ubiquitous distribution of intracellular Vitamin D receptor across diverse tissues and the emerging epidemiological evidence documenting increased risks of hypertension, cardiovascular disease, dementia and selected cancers associated with Vitamin D deficiency underscore the pleiotropic actions of Vitamin D. Evidence is also accumulating for a role of Vitamin D in maintaining normal glucose homeostasis. For instance, in both animal and human studies, Vitamin D depletion was significantly related to insulin resistance and impaired insulin secretion. Notably, this condition is reversible upon repletion of Vitamin D. Moreover, a significant and strong association between Vitamin D deficiency and β-cell dysfunction has been reported in healthy,
non-diabetic, or diabetic populations. Furthermore, circulating concentrations of 25-hydroxyvitamin D (25-[OH] D), the primary circulating form of Vitamin D, were significantly and inversely related to the risk for type 2 diabetes and related phenotypes in epidemiological studies.

A role of Vitamin D in pancreatic beta cell function might be mediated by the binding of circulating 1, 25 dihydroxy-vitamin D to the beta cell Vitamin D receptor. Alternatively Vitamin D could function through activation of 25-hydroxy Vitamin D by 1-alpha hydroxylase, which has been shown to be expressed in beta cells. Vitamin D can also exert an indirect effect via regulation of extracellular calcium levels and calcium flux through the beta cells, there by promoting insulin secretion, which is a calcium dependent process.

In some Indian studies by Marwaha et al (2005), Zargar et al (2007), Goswami et al (2008), Sahu et al (2008), shown that Vitamin D deficiency is epidemic in India despite plenty of sunshine. All Indian study point to low 25(OH)D levels in the population studies.

Aim And Objectives:
To determine the association between plasma 25-OH vitamin D concentration and type 2 diabetes mellitus.

Material And Methods:
98 randomly selected type 2 diabetes patients admitted to Maharaja Krushna Chandra Gajapati Medical college hospitals were included in the study. It is an observational study which comprise of measuring the serum level of Vitamin D3 in the diabetes patients admitted to Medicine ward. Group II (controls) included 50 healthy subjects with no long standing medical illness or history of drug intake affecting Vitamin D metabolism.

Selection of Patient:
Inclusion Criteria:
1. Type 2 Diabetes mellitus of age 25 to 75 years
   Diagnosis of Type 2 diabetes mellitus was made according to criteria laid down by WHO and American Diabetic Association.

Criteria:
1. Symptoms of diabetes plus random blood glucose concentration e” 11.1 mmol/L (200 mg/dL) Random is defined as without regard to time since the last meal
   or
   Fasting plasma glucose e” 7.0 mmol/L (126 mg/dL) Fasting is defined as no caloric intake for at least 8 h
   or
   A1C > 6.5% The test should be performed in laboratory certified according to A1C standards of the Diabetes Control and Complications Trial
   or
   Two-hour plasma glucose e” 11.1 mmol/L (200 mg/dL) during an oral glucose tolerance test The test should be performed using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water

Exclusion Criteria:
1. Patient of type I diabetes mellitus
2. Patient of chronic kidney disease
3. Patients on dialysis
4. Patient with diabetic nephropathy
5. Patient of epilepsy
6. Patients on drugs that affect Vitamin D metabolism e.g.; anti-epileptic drugs

Blood samples were collected for estimation of FBS, PPBS, Sr. calcium, Sr. phosphorous, Sr. urea, Sr. creatinine and Vitamin D. Plasma for sugar and serum for Vitamin D was obtained after centrifugation and. FBS, PPBS, Sr. calcium, Sr. phosphorous, Sr. urea, Sr. creatinine on automated analyser Erba Mannheim EM 360

Blood for HbA1c was tested by HPLC method using the VARIANT™ II TURBO Haemoglobin Testing System, Bio-Rad Laboratories, which is National Glycohaemoglobin Standardization Program (NGSP) certified and standardized to the Diabetes Control and Complications Trial (DCCT) reference assay

Sr. 25 OH Vit. D is estimated by radio immune assay. The subjects were classified as Vitamin D – deficient, insufficient and sufficient according to Lips p. Lips p classified hypovitaminosis D on the basis of the measurement of serum 25(OH)D concentrations (2).
1. Concentrations of 10–20, 5–10, and < 5 ng 25(OH)D/mL were classified as mild, moderate,
and severe hypovitaminosis D / deficiency, respectively.

- Vitamin D insufficiency is defined as concentrations of 20 – 30 ng 25(OH)D/mL.
- >30 ng 25(OH)D/mL is classified as Vitamin D sufficiency

**Radioimmunoassay (RIA)**

In RIA, the serum samples containing 25 (OH) Vitamin D are incubated with a fixed amount of 25 OH Vitamin D tracer labeled with radioactive iodine (125I). This radio-labeled Vitamin D tracer competes with 25 (OH) Vitamin D from the samples for a limited number of binding sites on antibodies, which are coated on tubes. The amount of Vitamin D in the sample can be estimated from the radiation emitted by the tracer, which is inversely proportional to the amount of Vitamin D in the sample

**Observation :**

Total 98 subjects were selected after exercising the inclusion and exclusion criteria. After taking informed consent as per ethical committee recommendation detailed history as per Performa thorough clinical examination supported by necessary laboratory tests were done. 50 healthy subjects with no long standing medical illness or history of drug intake affecting Vitamin D metabolism were taken as control.

Statistical analysis was done using Microsoft Excel version-2007 and Graphpad Instant software. With the help of this software, mean, standard deviation, standard error of mean, confidence interval and p value were calculated.

**Base line characteristics of case and control group**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Non-DM (n=50)</th>
<th>T2DM (n=98)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>52.82 ± 7.72</td>
<td>52.28 ± 8.62</td>
<td>0.7</td>
</tr>
<tr>
<td>Sex (Male : Female)</td>
<td>28 : 22</td>
<td>52 : 46</td>
<td>-</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>164.86±6.37</td>
<td>163.10±7.08</td>
<td>0.24</td>
</tr>
<tr>
<td>Body weight (Kg)</td>
<td>71.18±6.69</td>
<td>70.59±7.57</td>
<td>0.61</td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td>26.25±1.08</td>
<td>26.51±1.45</td>
<td>0.26</td>
</tr>
<tr>
<td>HbA1C (%)</td>
<td>5.27±0.21</td>
<td>9.05±0.76</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>FPG (mg/dl)</td>
<td>82.04±7.35</td>
<td>185.44±28.46</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>PPBS (mg/dl)</td>
<td>125.76±5.97</td>
<td>287.24±34.45</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Calcium (mg/dl)</td>
<td>9.30±0.32</td>
<td>9.38±0.34</td>
<td>&lt;0.05(0.033)</td>
</tr>
<tr>
<td>Phosphorus (mg/dl)</td>
<td>3.32±0.29</td>
<td>3.42±0.24</td>
<td>&lt;0.05(0.019)</td>
</tr>
<tr>
<td>Sr. urea (mg/dl)</td>
<td>25.52±3.86</td>
<td>25.65±4.64</td>
<td>0.86</td>
</tr>
<tr>
<td>Sr. creatinine (mg/dl)</td>
<td>0.78±0.15</td>
<td>0.75±0.19</td>
<td>0.94</td>
</tr>
<tr>
<td>25(OH)D (ng/ml)</td>
<td>19.65±9.51</td>
<td>15.17±4.9</td>
<td>&lt;0.01(0.0057)</td>
</tr>
</tbody>
</table>

Table 1 indicates age and sex distribution of 98 diagnosed type 2 DM cases of whom 52 (53.06 %) were male,46 (46.94 %) were female. maximum number of cases were in 51 – 55 yr age group i.e 26 (26.52 %), out of which 11 are male and 15 are female.

**Figure 1**

**Age And Sex Distribution (Controls)**

<table>
<thead>
<tr>
<th>Age Group (Years)</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>41 - 45</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>46 - 50</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>51 – 55</td>
<td>9</td>
<td>18</td>
<td>28</td>
</tr>
<tr>
<td>56 – 60</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>&gt;60</td>
<td>6</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>56</td>
<td>84</td>
</tr>
</tbody>
</table>

Table 2 indicates age and sex distribution of 50 controls of whom 28 (56 %) were male, 22 (44 %) were female. maximum number of cases were in 51 – 55 yr age group i.e. 14 (28 %), out of which 9 (18 %) are male and 5 (10 %) are female.
Table 3 indicates mean FBS of cases was 185.44 ± 28.46 and control was 82.04 ± 7, p < 0.01 and mean PPBS of cases was 287.24 ± 34.45 and control was 125.76 ± 5.97, p < 0.01.

Table 4 indicates mean HbA1c of cases was 9.05 ± 0.76 and control was 5.27 ± 0.22, p < 0.01.

Table 5 indicates mean Sr calcium in mg/dl of cases was 9.38 ± 0.34 and control was 9.50 ± 0.33, p < 0.01 and mean Sr phosphorous in mg/dl of cases was 3.42 ± 0.27 and control was 3.32 ± 0.29, p < 0.01.

Table 6 indicates mean level of level of 25 OH Vit. D of cases was 15.17 ± 9.0 ng/ml and control was 19.65 ± 9.52 ng/ml, with a p < 0.01.
Discussion:

In this study 98 cases of type 2 Diabetes mellitus and 50 healthy controls were taken for study. Both cases and controls were well matched for age, sex, BMI. The mean level of Vitamin D3 in diabetes patients is 15.17 ± 9.0 ng/ml with a Vit. D deficiency prevalence of 75.5% as compared to control group serum level of Vitamin D3 is 19.65 ± 9.52 ng/ml with a Vit. D deficiency prevalence of 60%. This study shows that the both control & diabetic population is deficient in serum Vit. D level and in diabetes patients it is still low as compared to non-diabetic control group.

A t-test comparing these two groups was significant (P =0.0057). The low serum Vitamin D levels were negatively correlated with HbA1c (r = -0.20), the FBS (r = -0.25) as well as the postprandial blood sugar levels (r = - 0.15).

This case control study shows that there is significant correlation between serum level of Vitamin D and Glycated hemoglobin level of the patients.

A study by Balasubramanian Shanthi et al16, showed the similar result with the age of the participants ranged between 43.42 ±7.877 years with the 25(OH)D insufficiency (18.49 ± 3.497 ng/ml) and the assessed glycaemic control with FBS(146.22 ± 45.007 ng/dl) r = -0.090, PPBS(275.28 ±66.400mg/dl) r = -0.095 and HBA1C (8.326 ±1.15843) r = -0.173.

The study Vitamin D Deficiency And Type 2 Diabetes Mellitus In A North Indian Population by Mala Mahto et al had shown the mean serum Vitamin D in cases (type 2 Diabetes) and control was 14.1 (± 2.0544, C.I 0.95) and 21.3 (± 3.1454, C.I 0.95) respectively. A t-test comparing these two groups was significant (P =0.0002).

The study by Jung Re Yu, et al17 Serum Vitamin D Status and Its Relationship to Metabolic Parameters in Patients with Type 2 Diabetes Mellitus shown Mean 25(OH)D serum levels were quite low in both control and T2DM subjects (15.4±0.5 and 12.9±0.4 ng/ml, respectively) p <0.01.

A Korean study by Lee et al 18 showed that the mean concentration (±SD) of 25(OH)D in patients with T2DM was 11.2 (±6.1) ng/ml with a prevalence of Vit. D deficiency of 85.9%.

A Japanese study by Suzuki et al 19 showed that the mean serum 25(OH)D concentration (±SD) in patients with T2DM was 17.0 (±7.1) ng/ml in the winter and was not statistically different from that in a normal population (17.5±3.6 ng/ml) with a Vit. D deficiency prevalence of 70.6%.

Two reports on the serum 25(OH)D levels of patients with T2DM in the United States by Kos E, Liszek MJ, Emanuele MA et al, and by Payne JF, Ray R,et al revealed higher mean values, 22.9 ng/ml and 22.3 ng/ml each.

These results suggest that the 25(OH)D level in patients with T2DM varies widely according to ethnic or other backgrounds.
Pittas et al have systematically reviewed world literature related to -

1. association between Vitamin D deficiency (VDD) and prevalence/incidence of type 2 DM in different population, and
2. randomized trials assessing role of Vitamin D supplementation on glucose metabolism.

In most case-control studies reviewed by Pittas et al, patients with type 2 diabetes showed a lower mean 25(OH) D concentrations than the non-diabetic controls. However, some of the case-control studies have failed to show such an association. Two prospective studies also examined the association of Vitamin D intake with incident type 2 DM In Women’s Health Study, subjects with daily Vitamin D intake >511 IU had lower risk of incidence of DM when compared to a cohort with daily Vitamin D intake of<159 IU per day (2.7% vs. 5.6%). Pittas et al also examined association between combined Vitamin D and calcium intake and incidence of type 2 DM among 83,806 women in Nurses’ Health Study. After adjusting for age, BMI, and non dietary covariates, a significant inverse association was observed between Vitamin D intake and calcium intake on one hand and risk of type 2DM on the other In the largest cross sectional study to date from National Health and Nutrition Examination Survey (NHANES) data, serum 25-OHD concentration (after multivariate adjustment) was inversely associated with diabetes prevalence in a dose-dependent pattern in non-Hispanic whites and Mexican-Americans. In the same study, 25-OHD concentration also correlated with measures of insulin resistance [estimated by homeostatic model assessment (HOMA-IR) based on fasting glucose and insulin levels] but did not correlate with â-cell function(estimated by HOMA-â). No correlation between 25-OHD and diabetes prevalence or measures of insulin resistance or cell function was seen in non-Hispanic blacks. This lack of association may be explained by the observation that non-whites exhibit a different Vitamin D, calcium, and PTH homeostasis compared with whites. Combining data from all studies that reported on the association between 25-OH Vitamin D level and prevalent type 2 DM, Pittas et al in the meta analysis review summarised the OR as 0.54 (95% CI, 0.23–1.27) for the highest vs. the lowest 25-OHD concentration (25–38 vs. 10–23 ng/ml, respectively), but with significant heterogeneity among studies

**Summary and Conclusion :**

- Of the total 98 cases studied 52 (53 %) were males and 46 (47 %) cases were female and 50 control [28 (56 %) males, 22 (44 %) female].
- Out of 98 diabetic cases 74(75. %) were Vit. D deficient i.e. < 20 ng /ml, 10 (10.2 %) subjects were Vit. D insufficient and 14 (14.3 %) were Vit. D sufficient.
- Out of 50 controls 30 (60 %)were Vit. D deficient i.e. < 20 ng /ml, 6 (12 %) were Vit. D insufficient and 14 (28 %) were Vit. D sufficient.
- The mean level of 25 OH Vit. D in diabetic cases was 15.17 ±0.9 ng/ml. The mean level of 25 OH Vit. D in control was 19.65 ± 9.52 ng / ml with p <0.01 (0.0057) indicating a significant co-relation.
- The mean HbA1C in diabetic cases was 9.05 ± 0.76 and in controls was 5.27 ± 0.22, p <0.01
- Mean Sr calcium in diabetic cases was 9.38 ± 0.34 mg /dl and Sr calcium in control was 9.50 ± 0.33 mg /dl, p <0.05
- There was negative co relation of Sr. Vit. D level with FBS (r = -0.25),PPBS (r = -0.15) and HbA1c (r = -0.20).

In view of high incidence of Vitamin D deficiency across general population a long term follow up study involving large number of patient is necessary to substantiate the relationship between Vitamin D deficiency and diabetes mellitus.

**Bibliography**

17. Jung Re Yu, Sang Ah Lee et al, Serum Vitamin D Status and Its Relationship to Metabolic Parameters in Patients with Type 2 Diabetes Mellitus Chonnam Med J 2012;48:108-115

---

APICON ODISHA 2014
8th & 9th November, 2014
Venue: MKCG Medical College, Berhampur
Scientific Programme by National & State Faculties

Contact Details:
Dr. Uma Sankar Mishra  Dr. D.M. Tripathy  Dr. G. Sethy
Organising Secretary  Chairman, Organising Committee  Treasurer
Dept. of Medicine, MKCG Medical College, Berhampur
An innovative approach to complete postoperative analgesia for paediatric patients through caudal Jelco cannula technique – A pilot study.

S. Mishra1, C. Patra2

Abstract:
In the changing scenario of analgesic techniques, completely pain free postoperative period is a dream for the children & challenge for the anaesthesiologists. This is due to the technical & economic issues as well as the myth involved in paediatric patients, resulting in under-treatment of postoperative pain in them. Though patient controlled epidural analgesia is one of the gold standards, for most of the poor patients, especially in a developing country like India, it is really a dream. Hence in search of a safe, yet effective as well as an economical method of postoperative analgesia in paediatric patient, this pilot study was undertaken using the innovative caudal Jelco cannula technique, in 60 ASA grade I & II paediatric patients, undergoing abdominal, perineal & lower limb surgery. In this study the result of the study group comprising of twenty patients & receiving Injection Buprenorphin, every 24 to 36 hours for 96 hours, through the caudal Jelco cannula, was compared with two control groups of twenty patients in each, out of which one group receiving conventional single dose of intravenous Fortwin & Phenergan & the other one receiving a single dose of caudal Buprenorphin. It was observed that intermittent dose of Buprenorphin through innovative caudal Jelco cannula technique, is a very safe, economical & most complete form of postoperative analgesia in children undergoing abdominal perineal & lower limb surgery in comparison to the existing mode of conventional postoperative analgesia techniques like intravenous Fortwin & Phenergan or a single shot post operative caudal Buprenorphin.

Introduction:
In the changing scenario of analgesic techniques, completely pain free postoperative period is a dream for the children & challenge for the anaesthesiologists. Though many modalities of postoperative analgesia are available in today’s world, a complete, yet ideal postoperative analgesia in paediatric patients is still under-achieved and it is a hard fact that pain is under-treated in children.

The reasons for withholding analgesia in children are, difficulties in distinguishing pain from hunger & fear, the myth and false notion about pain sensitivity in children, lack of information regarding safety & efficacy of analgesics in paediatric age group, difficulty of analgesic technique in them in comparison to adults, they are fearful of needle prick and last but not the least is fear of opioids addiction & respiratory depression. And the end result is under-treatment of pain in children.

Hence, a solution is always sought for.

Aim of the study:
This pilot study was designed to evaluate the efficacy & safety of the innovative technique of Jelco cannula into caudal epidural sac, using the drug Buprenorphin in intermittent dosing interval in comparison to conventional modalities like single shot caudal Buprenorphin, or intravenous Fortwin with Intravenous Phenergan for providing complete postoperative analgesia (for a period of 96hr.) in paediatric patients undergoing upper abdominal, lower abdominal, perineal & lower limb surgery.

Materials & Methods:
The study was carried out in SCB Medical College in the year of 2002-2003. In this prospective, randomized, observer-blinded experimental study, after institutional approval & informed consent from the parents and after routine laboratory investigations &
pre-anaesthetic check up (PAC), sixty ASA Grade I & II, paediatric patients of age 4 months - 12 yrs were included in the study. Babies having bleeding diathesis, infections at the puncture sites, preexisting neurological disease, sacral anomaly, respiratory disease & allergy to local anaesthetic were excluded. They were divided randomly into three groups, each comprising of twenty patients. All the groups were operated under same anaesthetic technique, but the modes of the postoperative analgesia were different in all the groups. A double blind technique was used for the analgesic technique & the pain assessment. Two blinded anesthesiologists and a blinded nurse observer were involved in the study. Any patient, having traumatic caudal cannulation in the study group were also planned to be excluded from the study.

**Group-I (Jelco cannula or the Study group)**

was divided into two sub groups of 10 patients each, namely IA (undergoing upper abdominal surgery, who, at the end of surgery, received Buprenorphin 5µg/kg, diluted in 0.75ml/kg of normal saline, with a dosing, every 24 hr) and IB (undergoing below umbilicus surgery, who, at the end of surgery, received Buprenorphin 5 µg/kg diluted in 0.5ml/kg with a dosing every 36 hr).[1]

**Group-II (Single shot caudal Buprenorphin group or control group I)**

was also divided into two groups of upper abdominal (Gr. II A) & below umbilicus surgery group( Gr.II B) of ten patients each. They received the same dose as the study groups, but only once at the end of the surgery.

**Group-III (conventional or Control group – II)**

patients were also divided similarly as above into two sub groups of ten patient each for upper abdominal surgery (Gr. III A) & below umbilicus surgery (Gr. III B). Both the subgroups received the conventional analgesics (i.e., Fortwin 0.5mg/kg. + Phenergan 0.5mg/kg.) as a single dose at the end of surgery.

Post operatively, pain assessment was done by the nurse observer (who was blinded to the analgesic technique used) every 6 hourly for 96 hours & complications were noted.(Figure-1,2,3&4)
TABLE-I
DEMOGRAPHIC DATA (M±SD)

<table>
<thead>
<tr>
<th>GROUP</th>
<th>AGE (IN MONTHS)</th>
<th>HEIGHT (IN CMS.)</th>
<th>WEIGHT (IN KGS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>66.3 ± 46.86</td>
<td>102.65 ± 31.02</td>
<td>18.95 ± 8.45</td>
</tr>
<tr>
<td>II</td>
<td>65.95 ± 46.48</td>
<td>101.8 ± 31.34</td>
<td>17.8 ± 8.56</td>
</tr>
<tr>
<td>III</td>
<td>66.7 ± 46.46</td>
<td>102 ± 30.09</td>
<td>18.55 ± 8.36</td>
</tr>
</tbody>
</table>

CAUDAL JELCO CANNULA TECHNIQUE:
At pre-anaesthetic checkup (PAC) - parents were explained regarding cleanliness & importance of preventing colonization & infection through caudal Jelco cannula. [2, 3] Skin preparation was done with Iteol-3.

After induction of general anaesthesia, appropriate sized Jelco cannula (24, 22 or 20G cannula without having a protruding drug injection port unlike other regular cannula) with 2 holes made 1 cm. behind the tip with a sterile needle, inserted aseptically into sacral hiatus by conventional method (Figure-5). While negotiating, tip of the cannula was made free from stylet & pushed into the epidural space (Figure-6). It was followed by 0.1 ml of heparin lock (10 units/ml). Stylet was withdrawn & stopcock was applied (Figure-7, 8 & 10). Cannula was well secured by elastoplast (Figure-11). At the end of surgery, appropriate analgesic drugs were injected (figure- 9). Then sterile padding was applied (Figure-9 & 12).
Care of sacral area was done by antiseptic application, changing of dressing & Jusgo (diclofenac) spray application every 24 hr. After each analgesic dose, the caudal cannula was flushed with 0.5 ml of normal saline. Cannula blockade, when occurred were taken care of by using the stylet, aseptically. After last dose, washings of cannula tip were sent for culture report.

Observation:

PAIN ASSESSMENT: For age ≥ 6 years, pain assessment was done subjectively by 5 point verbal rating scale.

Subjective pain assessment by 5 point verbal rating scale.[4]

- No pain adequate pain relief
- Slight discomfort inadequate pain relief
- Much discomfort
- In pain slight discomfort
- In much pain

When baby was asleep, pain relief was considered to be adequate.

For age < 6 years, pain assessment was done objectively by behavioral change.

Objective pain assessment by behavioral change

1. Cheerful Adequate pain relief
2. No restricted daily activity Adequate pain relief
3. No sleep impairment
1. Grimace Inadequate pain relief
2. Guarding posture
3. Vocalization (ouch or cry)
4. Restricted daily activity
5. Sleep impairment

Respiratory Depression:

Respiratory depression is said to occur, when O₂ sat. < 95% and / or Resp. rate less by 5/min. of PAC value.

Statistical Analysis:

Statistical analysis was done by Z TEST (large sample size test, sample size > 30)

\[ I \ Z \ I = \frac{\bar{x} - \bar{y}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \]

Where, \( \bar{x} \) = mean of cases
\( \bar{y} \) = mean of controls
\( n_1 \) = number of cases
\( n_2 \) = number of controls
\( s_1 \) = standard deviation of cases
\( s_2 \) = standard deviation of controls

I Z I < 1.96 - N.S. (P value, statistically not significant)
\[ \geq 1.96 - P < 0.05 \text{ (P value, statistically significant \*)} \]

\[ \geq 2.58 - P < 0.01 \text{ (P value, moderately significant \**)} \]

\[ \geq 3.00 - P < 0.001 \text{ (P value, highly significant \***)} \]

**Result:**

Caudal Jelco cannula itself was a very simple & easy to perform technique without any significant complications, which could be easily overcome. There was no incidence of traumatic tap.

Throughout the study period, significantly more number of patients in the study group was seen to have adequate pain relief (A-9.5 ± 0.73, B - 9.625 ± 0.71) in comparison to other two control groups. (IIA - 3.125 ± 4.37,

IIB - 3.81 ± 4.6, IIIA - 7.5 ± 2, IIIB - 7.375 ± 2.3) (Statistically, P value is highly significant, \( p < 0.001, \*** \)).

Reported side effects were nausea & vomiting, which were also seen in other two control groups.

**Table - II**

Number of patients with adequate pain relief throughout the study period (M ± Sd)

<table>
<thead>
<tr>
<th>GROUP I</th>
<th>GROUP II</th>
<th>GROUP III</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>9.5 ±0.71</td>
<td>9.625±0.71</td>
<td>3.125±4.37</td>
</tr>
</tbody>
</table>

\[ p *** \]

**Discussion:**

Although many approaches to paediatric postoperative analgesia are in vogue in the recent era of pain relief, Jelco cannula technique can still be considered a better alternative, though innovative, because of the following reasons.

1. Most easy in paediatric age group.
2. Safe & less cumbersome.
3. Jelco cannula is one of the most smooth cannula, does not kink and without any blunting of tip.
4. As there is no injection port, it does not poke or hurt the baby when lying supine.
5. It is a very economical and unlike epidural, no sophisticated kit or technique is required.

Though many potent opioid analgesics are available, in this study buprenorphine was used. The rationale behind it’s use is as follows:

1. It is freely available over the counter; no narcotic drug license is required, unlike fentanyl & morphine
2. It is long acting & very potent (20 to 30 times that of morphin). \[ ^{[5]} \]
3. Being a partial agonist of Kappa receptor it has got profound influence on visceral, inflammatory & pressure pain, hence a very good choice for post operative analgesia especially after visceral surgery.
4. Unlike many opioids, it is not associated with urinary retention.
5. Being very much lipid soluble, it crosses, succession of barriers to enter receptor at gray
matter to have a quick onset of action i.e., within 20 to 30 minutes. There is also rapid penetration & egress from CSF, and hence, less free drug in CSF with less chance of rostral migration & delayed respiratory depression like morphine.

6. Analgesic prolongation occurs due to high receptor association potential of Buprenorphin resulting in floating around receptors.

7. Unlike local anaesthetics - it provides analgesia without central depression, motor blockade, sympathetic denervation & loss of sensation.

8. Unlike other worker, in this study less diluents volume was used, hence almost nil side effects like respiratory depression, nausea, hypotension or bradycardia. (6, 7)

9. Cannula blockade was easily overcome either by flushing with normal saline or withdrawing the cannula a little and inserting the stylet.

10. Local inflammation & erythema - subsided by Jusgo spray (Diclofenac sodium spray)

11. Patient discomfort for cannula in situ was dealt by consoling the baby.

Summary & Conclusion:

This pilot study shows that, caudal Jelco cannula technique using the drug Buprenorphin is very effective for providing adequate postoperative analgesia for a long period i.e. 4 days, in paediatric patients.

Though an innovative technique, it is easy for the anaesthesiologists to perform without requiring any sophisticated kit, inexpensive for the patients without any complication and with 100% patient compliance & hence very useful & can be recommended for common mass of people in the developing countries like ours.

As this is a pilot study, more and more pioneering research needs to be conducted in larger study group & using other drugs.

Acknowledgement:

The data in this paper was presented in ISA, Odisha State conference in 2003 & had received S. Satpathy Memorial Award (best scientific paper award, among the qualified anaesthesiologists of Odisha).

Conflict of interest: Nil

Sources of support: Nil

References:


Dynamic Lung Functions in Pregnancy Complicated with Anemia

P. Samanta¹, K. Dash², S. Dash³, S. S. Nanda⁴, S. Misra⁵, A. Priyadarshini⁶, R.R. Mohanty⁷.

Abstract:

The aim of the present study was to find out the variation of pulmonary function parameters in different trimesters of pregnancy as well as variation according to severity of anemia in each trimester.

This study entitled "Dynamic lung functions in pregnancy complicated with anemia", embodies the pulmonary functions of 60 anemic pregnant females (study group) and 100 healthy pregnant females (control) in different trimesters of pregnancy. The pulmonary function parameters, which were studied, are FVC, FEV₁, FEV₁/FVC, FEF₂₅-₇₅%, PEFR and MVV in both the study and control group. Comparing the variation with advancing gestation in study and control, it was seen that FVC, FEV₁, FEV₁/FVC and FEF₂₅-₇₅% showed no significant alteration. With increasing severity of anemia compared to controls, FVC, FEV₁, PEFR and MVV values reduce significantly. As FEF₂₅-₇₅% is not effort dependent, it shows no significant variation.

Thus from this study, it can be concluded that moderate to severe anemia in pregnancy can adversely affect pulmonary functions. Hence nutritional anemia in early pregnancy should be provided with iron supplements in order to prevent adverse obstetric outcomes.

Key words: Anemia, Pregnancy, Pulmonary Function Test

Introduction:

India accounts for more than 20% of global maternal and child deaths[1], with a maternal mortality rate (MMR) of 212 per 100,000 live births and infant mortality rate (IMR) of 47 per 1000 live births, in 2010-11 [2]. Anemia underplays a key role for the development of different complications, the long term effect of which, is reflected in the mother and its fetus. Hence the impact of anemia is immense and extreme. The estimated prevalence of anemia in pregnant women is 14% in developed, 51% in developing countries and 65-75% in India [3,4]. The global prevalence of the same is 55.9%.[5] Pregnancy produces alteration in functions of all the systems of the body. Some of those alterations are mostly adaptive and pregnancy represents one of the best examples of selective adaptation in terms of respiratory physiology [6].

The changes in respiratory physiology are due to increasing size of the fetus with advancing gestation, which constitutes a mechanical impediment to normal process of ventilation[7,8]. Also an elevated level of progesterone observed during pregnancy may have an effect on the activity of the respiratory drive [9,10]. The knowledge of the expected or desired changes in pulmonary parameters is fundamental to understanding of, how the anemic state that affect pregnancy and vice versa[11]. It helps to manage the course and the gestational outcome for a safe delivery and fitness for anaesthesia[12]. Lots of work has been reported to show the changes in pulmonary function test during different trimesters of pregnancy [13-15]. But very few works has been documented till date to evaluate the dynamic lung function parameters in pregnancy complicated with anemia. So in this present study, an attempt has been made to justify the complications of anemia in pregnancy on the respiratory system, by comparing pulmonary function tests in anemic pregnant and healthy pregnant women as control.

Materials & Methods:

The present case control study was carried out...
in the post-graduate department of Physiology, S.C.B. Medical College and Hospital, Cuttack, during the period from October 2010 to October 2012. The study included 60 anemic pregnant women within the age group of 20-40 years. Out of which 16 subjects were in the first trimester, 25 in the second and 19 in the third trimester. It also included 100 age matched normal healthy pregnant women, of which 32 were in the first, 33 in the second and 35 subjects in the third trimester. All of them were selected from antenatal clinic of Obstetrics and Gynaecology department of S.C.B. Medical College and Hospital, Cuttack at random. The anemic patients had haemoglobin level in the range of 10.9 g/dl to 4 g/dl. The subjects were further sub-divided into mild, moderate and severe anemic groups based on WHO criteria for haemoglobin[16](Mild: 10 - 10.9 g/dl, Moderate :7 - 10 g/dl, Severe : 4 - 6.9 g/dl.)

After taking consent, all the subjects were thoroughly interrogated. Detailed history was taken and thorough medical examinations were done. The test was done in a fixed time schedule in the forenoon between 10 am to 12 noon, to avoid diurnal variation. The pulmonary function was assessed in all subjects by Medspiror having Helios 401 Software [by Recorders & Medicare Systems (RMS), Chandigarh, Version 0.1, Jan 2004]. Dynamic lung function parameters like FVC, FEV1, FEV1/FVC, FEF25-75%, PEFR and MVV were recorded.

Statistical analysis: All the Data were expressed as Mean ± SD. The parameters were compared in both the normal and anemic groups by the p value, calculated by unpaired students 't' test. A level of p value <0.05 was used to indicate statistical significance in all analyses.

ANOVA (Analysis of Variance) was used to compare the parameters between three trimesters of pregnancy and between different degrees of anemia in pregnancy.

Pearson's correlation analysis by correlation coefficient 'r' was performed to assess the relationship between pregnancy complicated with degrees of anemia and respiratory parameters.

All the data was analyzed using SPSS for Windows (SPSS Software package, version 16, SPSS Inc, Chicago, Illinois).

Results:

Comparisons of the dynamic lung function parameters like FVC, FEV1, FEV1/FVC, FEF25-75%, PEFR and MVV were done in each trimester of pregnancy between the study group and control group (table 1,2,3,4 & 5). Statistical test ANOVA was applied to compare.

The study group was further divided into mild, moderate and severe anemia in each trimester. The selected parameters were compared between control and mild, moderate, severe anemia in each trimester of pregnancy separately (Table 6-9). Comparison was done using ANOVA.

Table -1

<table>
<thead>
<tr>
<th>Dynamic Lung Function Parameters of 1st Trimester Pregnant Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Group (n = 16)</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Control Group (n = 32)</td>
</tr>
<tr>
<td>'t' value</td>
</tr>
<tr>
<td>'r' value</td>
</tr>
<tr>
<td>Significance</td>
</tr>
</tbody>
</table>

All data presented are in Mean ± SD. [P>0.05 -Not Significant (NS), P <0.05 - Significant (S), P <0.01 - Highly Significant (HS)*] FVC: Forced vital capacity, FEV1: Forced expiratory Volume in first second.

FEV1/ FVC %: Ratio of FEV1 and FVC in percentage.

FEF (25-75%): Forced expiratory flow rate over the middle 50% of the FVC.

PEFR: Peak expiratory flow rate, MVV: Maximum Voluntary Ventilation

There is decrease of the FVC, PEFR and MVV values in anemic pregnant than normal pregnant women and this is highly significant statistically (P <0.01). The decrease of FEV1 is only significant. FEV1 / FVC ratio increases significantly in study subjects than control subjects. FEF 25-75% shows no significant difference among anemic and normal pregnant females. (Table -1)
### Table -2

<table>
<thead>
<tr>
<th></th>
<th>Study Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FVC (Lt)</strong></td>
<td>2.1936 ± 0.3040</td>
<td>2.5055 ± 0.2491</td>
</tr>
<tr>
<td><strong>FEV1 (Lt)</strong></td>
<td>1.9024 ± 0.2778</td>
<td>2.1176 ± 0.2457</td>
</tr>
<tr>
<td><strong>FEV1 / FVC (%)</strong></td>
<td>86.6895 ± 0.3690</td>
<td>84.4196 ± 0.2457</td>
</tr>
<tr>
<td><strong>PEFR (L/sec)</strong></td>
<td>2.5524 ± 0.3639</td>
<td>2.2467 ± 0.2453</td>
</tr>
<tr>
<td><strong>PEFR (L/sec)</strong></td>
<td>2.1936 ± 0.3040</td>
<td>2.5055 ± 0.2491</td>
</tr>
<tr>
<td><strong>MVV (L/min)</strong></td>
<td>55.40 ± 8.7178</td>
<td>67.7576 ± 6.210</td>
</tr>
</tbody>
</table>

All data presented are in Mean ± SD.

[P>0.05 - Not Significant (NS), P <0.05 - Significant (S), P <0.01 - Highly Significant (HS)*]

There were statistically highly significant reduction of FVC, FEV1, PEFR and MVV values in anemic pregnant females compared to controls. FEV1 / FVC is increased in study group than control, which is also statistically highly significant. Decline in FEF25-75% values is not significant. (Table -2)

### Table -3

<table>
<thead>
<tr>
<th></th>
<th>Study Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FVC (Lt)</strong></td>
<td>2.1263 ± 0.2883</td>
<td>2.4617 ± 0.2631</td>
</tr>
<tr>
<td><strong>FEV1 (Lt)</strong></td>
<td>1.8771 ± 0.2747</td>
<td>2.097 ± 0.2453</td>
</tr>
<tr>
<td><strong>FEV1 / FVC (%)</strong></td>
<td>87.932 ± 0.3499</td>
<td>85.1431 ± 0.3134</td>
</tr>
<tr>
<td><strong>PEFR (L/sec)</strong></td>
<td>2.5853 ± 0.3489</td>
<td>2.7023 ± 0.2778</td>
</tr>
<tr>
<td><strong>PEFR (L/sec)</strong></td>
<td>4.6714 ± 0.5458</td>
<td>4.6714 ± 0.5458</td>
</tr>
<tr>
<td><strong>MVV (L/min)</strong></td>
<td>62.714 ± 6.0758</td>
<td>62.714 ± 6.0758</td>
</tr>
</tbody>
</table>

All data presented are in Mean ± SD.

[P>0.05 - Not Significant (NS), P <0.05 - Significant (S), P <0.01 - Highly Significant (HS)*]

The decline of FVC, FEV1, PEFR and MVV values in anemic pregnancy than normal pregnancy are highly significant statistically, but FEF25-75% shows no significant variation. FEV1 / FVC increases significantly in study than control group. (Table-3)
Table 4
Comparison of Dynamic Lung Function Parameters between three trimesters in study group (n = 60) (ANOVA)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; trimester (n = 16)</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; trimester (n=25)</th>
<th>3&lt;sup&gt;rd&lt;/sup&gt; trimester (n=19)</th>
<th>F Value</th>
<th>P Value (Significance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FVC (L)</td>
<td>2.27 ± 0.34</td>
<td>2.19 ± 0.30</td>
<td>2.13 ± 0.28</td>
<td>0.924</td>
<td>0.403 (NS)</td>
</tr>
<tr>
<td>FEV1 (L)</td>
<td>1.95 ± 0.27</td>
<td>1.90 ± 0.28</td>
<td>1.97 ± 0.27</td>
<td>0.336</td>
<td>0.716 (NS)</td>
</tr>
<tr>
<td>FEV1/FVC (%)</td>
<td>85.99 ± 2.49</td>
<td>86.69 ± 2.86</td>
<td>87.93 ± 3.82</td>
<td>1.775</td>
<td>0.179 (NS)</td>
</tr>
<tr>
<td>FEF25-75% (L/sec)</td>
<td>2.54 ± 0.33</td>
<td>2.55 ± 0.36</td>
<td>2.58 ± 0.34</td>
<td>0.090</td>
<td>0.914 (NS)</td>
</tr>
<tr>
<td>PEFR (L/Sec)</td>
<td>4.92 ± 0.61</td>
<td>4.23 ± 0.55</td>
<td>3.69 ± 0.56</td>
<td>20.074</td>
<td>0.000 (HS)*</td>
</tr>
<tr>
<td>MVV (L/min)</td>
<td>63.44 ± 9.25</td>
<td>55.40 ± 8.72</td>
<td>51.00 ± 8.61</td>
<td>8.775</td>
<td>0.000 (HS)*</td>
</tr>
</tbody>
</table>

All data presented are in Mean ± SD.

[P>0.05 -Not Significant (NS), P <0.05 - Significant (S), P <0.01 - Highly Significant (HS)*]

There were no significant variation of FVC, FEV1, FEV1/FVC and FEF25-75% values from 1st to 3rd trimester in study group. But PEFR and MVV are highly significantly reduced from 1st to 3rd trimester in study group. (Table-4)

Table 5
Comparison of Dynamic Lung Function Parameters between three trimesters in control group (n = 100) (ANOVA)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; trimester (n = 32)</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; trimester (n=33)</th>
<th>3&lt;sup&gt;rd&lt;/sup&gt; trimester (n=35)</th>
<th>F Value</th>
<th>P Value (Significance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FVC (L)</td>
<td>2.54 ± 0.28</td>
<td>2.51 ± 0.25</td>
<td>2.46 ± 0.26</td>
<td>0.924</td>
<td>0.403 (NS)</td>
</tr>
<tr>
<td>FEV1 (L)</td>
<td>2.13 ± 0.26</td>
<td>2.12 ± 0.24</td>
<td>2.09 ± 0.24</td>
<td>0.924</td>
<td>0.403 (NS)</td>
</tr>
<tr>
<td>FEV1 / FVC (%)</td>
<td>83.89 ± 3.28</td>
<td>84.42 ± 3.27</td>
<td>85.14 ± 3.13</td>
<td>1.775</td>
<td>0.179 (NS)</td>
</tr>
<tr>
<td>FEF25-75% (L/sec)</td>
<td>2.67 ± 0.27</td>
<td>2.69 ± 0.25</td>
<td>2.70 ± 0.28</td>
<td>0.090</td>
<td>0.914 (NS)</td>
</tr>
<tr>
<td>PEFR (L/Sec)</td>
<td>5.67 ± 0.41</td>
<td>5.12 ± 0.46</td>
<td>4.67 ± 0.54</td>
<td>20.074</td>
<td>0.000 (HS)*</td>
</tr>
<tr>
<td>MVV (L/min)</td>
<td>72.91 ± 6.88</td>
<td>67.76 ± 6.21</td>
<td>62.71 ± 6.07</td>
<td>21.286</td>
<td>0.000 (HS)*</td>
</tr>
</tbody>
</table>

All data presented are in Mean ± SD.

[P>0.05 -Not Significant (NS), P <0.05 - Significant (S), P <0.01 - Highly Significant (HS)*]

The variation of FVC, FEV1, FEV1 / FVC and FEF25-75% values in the three trimesters, in control group are not statistically significant. However, PEFR and MVV values decline progressively from 1st to 3rd trimester, which is statistically highly significant. (Table-5)
Table - 6
Comparison of Dynamic parameters between control group and study group with different degrees of Anaemia in 1st Trimester using ANOVA

<table>
<thead>
<tr>
<th></th>
<th>Control (n = 32)</th>
<th>Mild Anaemia (n = 8)</th>
<th>Moderate Anaemia (n = 5)</th>
<th>Severe Anaemia (n = 3)</th>
<th>F Value</th>
<th>P value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>FVC (L)</td>
<td>2.54 ± 0.28</td>
<td>2.42 ± 0.31</td>
<td>2.216 ± 0.36</td>
<td>1.96 ± 0.16</td>
<td>5.130</td>
<td>0.004</td>
<td>(HS)*</td>
</tr>
<tr>
<td>FEV1 (L)</td>
<td>2.13 ± 0.26</td>
<td>2.05 ± 0.258</td>
<td>1.92 ± 0.29</td>
<td>1.716 ± 0.13</td>
<td>2.992</td>
<td>0.041</td>
<td>(S)</td>
</tr>
<tr>
<td>FEV1/FVC (%)</td>
<td>83.89 ± 3.28</td>
<td>84.93 ± 1.62</td>
<td>86.69 ± 2.87</td>
<td>87.66±3.284</td>
<td>2.403</td>
<td>0.080</td>
<td>(NS)</td>
</tr>
<tr>
<td>FEF25-75% (L/sec)</td>
<td>2.67 ± 0.277</td>
<td>2.59 ± 0.337</td>
<td>2.514 ± 0.32</td>
<td>2.4 ± 0.46</td>
<td>0.966</td>
<td>0.417</td>
<td>(NS)</td>
</tr>
<tr>
<td>PEFR (L/Sec)</td>
<td>5.67 ± 0.405</td>
<td>5.38 ± 0.34</td>
<td>4.608 ± 0.40</td>
<td>4.20 ± 0.44</td>
<td>20.822</td>
<td>0.000</td>
<td>(HS)*</td>
</tr>
<tr>
<td>MVV (L/min)</td>
<td>72.91 ± 0.88</td>
<td>70.37 ± 5.18</td>
<td>60.6 ± 4.16</td>
<td>49.66 ± 4.04</td>
<td>16.269</td>
<td>0.000</td>
<td>(HS)*</td>
</tr>
</tbody>
</table>

All data presented are in Mean ± SD.

[>0.05 -Not Significant (NS), P <0.05 - Significant (S), P <0.01 - Highly Significant (HS)*]

There is highly significant reduction in FVC, PEFR and MVV and significant reduction in FEV1 from control to severe anemic pregnant females. FEV1/FVC and FEF25-75% values however, show no significant variation in between the groups. (Table-6)

Table - 7
Comparison of Dynamic parameters between control group and study group with different degrees of Anaemia in 2nd Trimester using ANOVA

<table>
<thead>
<tr>
<th></th>
<th>Control (n = 33)</th>
<th>Mild Anaemia (n = 8)</th>
<th>Moderate Anaemia (n = 12)</th>
<th>Severe Anaemia (n = 5)</th>
<th>F Value</th>
<th>P value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>FVC (L)</td>
<td>2.51 ± 0.249</td>
<td>2.39 ± 0.33</td>
<td>2.19 ± 0.203</td>
<td>1.86 ± 0.234</td>
<td>11.440</td>
<td>0.000</td>
<td>(HS)*</td>
</tr>
<tr>
<td>FEV1 (L)</td>
<td>2.12 ± 0.24</td>
<td>2.05 ± 0.32</td>
<td>1.901 ± 0.190</td>
<td>1.67 ± 0.253</td>
<td>5.921</td>
<td>0.001</td>
<td>(HS)*</td>
</tr>
<tr>
<td>FEV1/FVC (%)</td>
<td>84.42 ± 3.27</td>
<td>85.37 ± 2.57</td>
<td>86.92 ± 2.98</td>
<td>88.22 ± 2.54</td>
<td>5.921</td>
<td>0.022</td>
<td>(S)</td>
</tr>
<tr>
<td>FEF25-75% (L/sec)</td>
<td>2.69 ± 0.244</td>
<td>2.61 ± 0.37</td>
<td>2.5 ± 0.38</td>
<td>2.49 ± 0.37</td>
<td>1.204</td>
<td>0.317</td>
<td>(NS)</td>
</tr>
<tr>
<td>PEFR (L/Sec)</td>
<td>5.119 ± 0.46</td>
<td>4.79 ± 0.33</td>
<td>4.10 ± 0.38</td>
<td>3.65 ± 0.35</td>
<td>28.934</td>
<td>0.000</td>
<td>(HS)*</td>
</tr>
<tr>
<td>MVV (L/min)</td>
<td>67.75 ± 4.21</td>
<td>65.12 ± 6.13</td>
<td>53.08 ± 3.89</td>
<td>45.40 ± 4.27</td>
<td>36.198</td>
<td>0.000</td>
<td>(HS)*</td>
</tr>
</tbody>
</table>

All data presented are in Mean ± SD.

[>0.05 -Not Significant (NS), P <0.05 - Significant (S), P <0.01 - Highly Significant (HS)*]

There is statistically highly significant reduction in FVC, FEV1, PEFR and MVV values and only significant increase of FEV1/ FVC from control to severe anemic subjects. But FEF25-75% shows no significant reduction. (Table -7)
Comparison of Dynamic parameters between control group and study group with different degrees of Anaemia in 3rd Trimester (ANOVA)

<table>
<thead>
<tr>
<th>Pulmonary Parameters</th>
<th>Control (n=35)</th>
<th>Mild Anaemia (n=5)</th>
<th>Moderate Anaemia (n=9)</th>
<th>Severe Anaemia (n=5)</th>
<th>F Value</th>
<th>P value Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>FVC (L)</td>
<td>2.46 ± 0.26</td>
<td>2.35 ± 0.30</td>
<td>2.15 ± 0.198</td>
<td>1.84 ± 0.19</td>
<td>10.750</td>
<td>0.000 (HS)*</td>
</tr>
<tr>
<td>FEV1 (L)</td>
<td>2.09*</td>
<td>2.04 ± 0.25</td>
<td>1.89 ± 0.16</td>
<td>1.65 ± 0.25</td>
<td>5.583</td>
<td>0.002 (HS)*</td>
</tr>
<tr>
<td>FEV1/FVC (%)</td>
<td>85.14 ± 3.13</td>
<td>86.23 ± 5.03</td>
<td>88.08 ± 1.69</td>
<td>99.35 ± 5.34</td>
<td>3.508</td>
<td>0.022 (S)</td>
</tr>
<tr>
<td>FEF25-75% (L/sec)</td>
<td>2.70 ± 0.27</td>
<td>2.648 ± 0.406</td>
<td>2.50 ± 0.34</td>
<td>2.52 ± 0.38</td>
<td>0.723</td>
<td>0.543 (NS)</td>
</tr>
<tr>
<td>PEFR (L/sec)</td>
<td>4.67*</td>
<td>4.436 ± 0.25</td>
<td>3.605 ± 0.29</td>
<td>3.09 ± 0.211</td>
<td>24.428</td>
<td>0.000 (HS)*</td>
</tr>
<tr>
<td>MVV (L/min)</td>
<td>62.71 ± 6.07</td>
<td>60.80 ± 4.43</td>
<td>50.89 ± 5.79</td>
<td>41.4 ± 3.36</td>
<td>26.606</td>
<td>0.000 (HS)*</td>
</tr>
</tbody>
</table>

All data presented are in Mean ± SD.

[P>0.05 -Not Significant (NS), P <0.05 - Significant (S), P <0.01 - Highly Significant (HS)*]

There is statistically highly significant reduction of FVC, FEV1, PEFR and MVV values and significant increase of FEV1/FVC% from control to severe anemic pregnant females. FEF25-75% values show reduction but are not statistically significant. (Table -8)

Discussion:
The various dynamic lung function parameters studied in 1st, 2nd and 3rd trimesters of pregnancy in study (Table-4) as well as control group (Table-5), shows decrease in FVC and FEV1 values with advancing gestation which are statistically not significant. The ratio of FEV1/FVC % and FEF25-75% values are comparable among the three trimesters of pregnancy with no statistical significance. Similar results were found by Phatak M S et al (2003)[17]. This could be due to;

- A state of relative bronchodilation which might be brought about by the smooth muscle relaxing action of certain hormones such as progesterone, relaxin and corticosteroids.[18]
- The relative increase mobility of the thoracic cage as well as unimpaired diaphragmatic movement despite the progressive enlargement of gravid uterus may be the factors in preservation of FVC values.[17]
- The preservation of both the large and small airway function is the result of bronchoconstrictive effect of low alveolar pCO2 counteracted by bronchodilation, mainly produced by progesterone.[19]

It also reveals in present study a progressively significant reduction in PEFR values from 1st trimester to 3rd trimester in both study and control group(Table 4,5). These findings are comparable with many authors such as Phatak MS et al (2003)[17], Neeraj et al

Correlation of Haemoglobin with Pulmonary function parameters

<table>
<thead>
<tr>
<th>Pulmonary Parameters</th>
<th>Function</th>
<th>Pearson Correlation with Haemoglobin ('r')</th>
</tr>
</thead>
<tbody>
<tr>
<td>FVC (L)</td>
<td></td>
<td>0.642</td>
</tr>
<tr>
<td>FEV1 (L)</td>
<td></td>
<td>0.531</td>
</tr>
<tr>
<td>FEV1/FVC (%)</td>
<td></td>
<td>-0.371</td>
</tr>
<tr>
<td>FEF25-75% (L/sec)</td>
<td></td>
<td>0.325</td>
</tr>
<tr>
<td>PEFR (L/Sec)</td>
<td></td>
<td>0.698</td>
</tr>
<tr>
<td>MVV (L/min)</td>
<td></td>
<td>0.740</td>
</tr>
</tbody>
</table>

There is positive correlation of haemoglobin with FVC, FEV1, FEF25-75%, PEFR and MVV values, but negative correlation with FEV1 / FVC. (Table-9)
Progressively decreased values of MVV from 1st to 3rd trimester of pregnancy obtained in this study in anemic and control subjects (Table-4, 5) are similar to Ganeriwal S.K. et al (1984)[23] and De S et al (1984)[18]. The decrease in MVV may be explained by over stretching of muscles of anterior abdominal wall leading to decreased force of contraction of these muscles available for expiration. Also the enlarged uterus may push the diaphragm up leading to a decreased intra pleural pressure, which will affect the amount of air drawn in the lungs in a single respiration.[23]

MVV was also influenced by the efficiency of the respiratory apparatus as a pump. Since this pump was at a certain mechanical disadvantage during pregnancy, the MVV might be reduced without any obstruction to the airflow.[18]

Comparison of lung function parameters between anemic pregnant and healthy pregnant females (Table -1, 2&3) shows, significant reduction of FVC, FEV1, PEFR and MVV values except FEF 25-75% and FEV1/FVC in the study group (Anemic), in all the three trimesters of pregnancy.

FEF25-75% values decline in study group compared to control, but the difference is not statistically significant.

FEV1/FVC ratio increases significantly in study group compared to control in all three trimesters, as the decrease in FVC is more than decrease in FEV1 showing a restrictive defect.

The reduction of FVC, FEV1, PEFR and MVV may be attributed to reduction of oxygen carrying capacity of blood resulting in tissue hypoxia and accumulation of intermediary products of metabolism like lactate in the tissue leading to exhaustion. So the respiratory efforts become less powerful.[24]

The decrease in the concentration of myoglobin and iron containing enzymes like cytochrome C in skeletal muscle is roughly proportional to that of haemoglobin in both mild and severe anemia[25]. The resultant decrease in the work capacity due to voluntary respiratory muscles dysfunction could possibly explain the reduction in the force or effort dependent parameters like FVC, FEV1, PEFR and MVV.

The comparisons of dynamic parameters were done between control group and study group with different degrees of anemia in 1st trimester (Table -6). Using statistical test ANOVA (Table 6) the four groups (control, mild, moderate, severe) are compared. There is significant reduction in FVC, FEV1, PEFR and MVV values with increasing degree of anemia. FEV1/FVC values increase but are not statistically significant. The declines in FEF25-75% values are also not significant.

The PFT parameters between control group and study group with mild, moderate and severe anemia in 2nd trimester are compared (Table 7). ANOVA was used to compare the four groups. Studying the 'F' value and 'p' value it is seen that, there is highly significant lowering of FVC, FEV1, PEFR and MVV with increasing severity of anemia. FEV1/FVC increase significantly, but no significant change in FEF25-75% is seen.

The comparison between study group (mild, moderate and severe anemia) and control group in 3rd trimester was studied (Table-8). By studying the ANOVA, it shows statistically highly significant lowering of FVC, FEV1, PEFR and MVV values. FEV1/FVC increases only significantly, but no significant alteration in FEF 25- 75%. The correlation of hemoglobin with dynamic pulmonary function parameters (Table-9) shows positive correlation of hemoglobin with FVC, FEV1, FEF25-75%, PEFR and MVV but negative correlation with FEV1/FVC.

With increasing severity of anemia compared to controls, FVC, FEV1, PEFR and MVV values reduce significantly. This may be because anemia causes weakness of the main respiratory muscles due to tissue hypoxia, accumulation of lactates & metabolic products, deficiency of myoglobin & iron containing enzyme cytochrome C. As FEF25-75% is not effort dependent, it shows no significant variation.

So with decreasing haemoglobin, all the parameters decrease showing positive correlation
except FEV1/FVC in percentage which increase due to restrictive defect showing negative correlation with haemoglobin.

**Conclusion:**

Thus from this study, it can be concluded that moderate to severe anemia in pregnancy can adversely affect pulmonary functions. Hence nutritional anemia in early pregnancy should be provided with iron supplements in order to prevent adverse obstetric outcomes.

To the best of knowledge, this is the first study of its kind to demonstrate the relationship between different degrees of anemia and pulmonary function in pregnancy. Therefore the findings require further studies in this field.

**References:**

25. Dutt SN, Yeshwanth M, Raghouveer Ts. Effect of iron deficiency anaemia on pulmonary function in children. Lung India. 1944:12:No.4: P168-173
Evaluation of Serum Uric Acid in Essential Hypertension

K. Sasalu¹, A. Satapathy¹, Varun¹, P.K. Padhy², B.K. Behera³, K.K. Samal⁴, L.K. Meher⁴

Abstract:
The association of raised serum uric acid levels with various cardiovascular risk factors has often led to the debate of whether raised serum uric acid levels could be an independent risk factor in essential hypertension. Hence we carried out a study to examine the possibility of hyperuricemia causing hypertension, to see if there is a relationship between the serum uric acid levels and severity & duration of hypertension. The study was carried out in MKCG MEDICAL COLLEGE. The study period was from July 2010 to December 2012. A total of 400 patients were studied of which 200 were cases and 200 controls. The patients were included if they satisfied the JNC VII criteria for hypertension. They were excluded if they were having any other condition known to cause raised serum uric acid levels & secondary hypertension. The study showed that serum uric acid levels were raised in patients with hypertension in comparison to normotensives. The Mean SUA levels between cases and controls were 6.104 ± 1.576 and 5.685 ± 1.338 respectively. t-value = 2.866, p-value = .004. SUA levels in the stages of hypertension showed a mean serum uric acid level in stage 1 hypertension of 5.0312 ± 0.77 and stage 2 hypertension 6.4421 ± 1.615 the t-value of 8.213 and p-value = .000 which was significant. SUA level in patients with hypertension < 5 years was 5.163 ± 1.255 those with ≥ 5 years was 6.972 ± 1.326. t-value of 9.891, p-value = .000 which was also significant. Based on the study carried out we concluded that SUA can be used as an early biochemical marker to determine the severity and duration of hypertension.

Key words: Serum Uric Acid; Hypertension; JNC VII; Hyperuricemia.

Introduction:
Uric acid, which serves no biochemical function other than being an end product of purine metabolism, was first discovered in 1776. A Swedish chemist Scheele isolated it from a urinary tract stone. In 1797, a British chemist Wallaston detected uric acid in a tophus which was removed from his own ear. About 50 years later Alfred Baring Garrod, a British physician showed by chemical isolation that uric acid was abnormally high in gouty patients. In subsequent studies Garrod formulated a rational relationship between hyperuricemia and symptomatology of gouty patients. Association between hypertension and hyperuricemia was recognized when a family with a unique and unfortunate pedigree attended Hammer Smith hospital in 1957. The father and six of the seven siblings had hyperuricemia, while the mother and all the siblings had hypertension. This raised the question whether a raised serum uric acid was common in patients with hypertension. Raised serum uric acid has been reported to be associated with an increased risk of coronary heart disease and is commonly encountered with essential hypertension, even untreated hypertension, and type 2 diabetes, which are in turn associated with coronary heart disease. It is not known whether raised serum uric acid increases the risk of hypertension and type 2 diabetes independently of known risk factors such as age, obesity, alcohol consumption, and physical activity. This study was done to determine whether raised serum uric acid levels were an independent risk factor for developing hypertension.

Materials and Methods
Methods
In the following Hospital based study for the evaluation of serum uric acid levels in essential hypertension 400 patients who attended the out-patient and in-patient at the department of Medicine were evaluated for Serum Uric Acid levels of which 200 were cases and 200 were controls. The study was conducted over a period starting from July 2010 to
December 2012. Adult male and female patients > 18 years of age diagnosed as hypertensive according to JNC VII classification for hypertension were included as cases; patients were excluded if they had any of the following -

- Diabetes Mellitus,
- Ischaemic Heart Disease,
- All cases of secondary hypertension,
- Clinical Findings of gout or extra-articular manifestations of hyperuricemia
- Obesity (body weight exceeding 25% of body weight)
- H/o alcohol abuse
- H/o drugs known to cause hyperuricemia, e.g. thiazide diuretics
- H/o Renal disease
- H/o pre-eclampsic toxemia

Controls were patients without hypertension or any other condition known to cause hyperuricemia and were matched for age and sex with that of the cases.

**Observation:**

During the study period a total of 400 patients were studied of which 200 patients were cases that were categorized into Stage 1 or Stage 2 or stage 3 hypertension (base on JNC VII classification) and 200 were controls who were patients without hypertension or any other condition known to cause raised serum uric acid levels.

The total number of male cases was 145 and the total no of female cases 55. The age group ranged from 20 years to 90 years. The total number of male controls was 145 and the total no of female controls were 55. The age group ranged from 20 years to 90 years. The controls were adjusted with the cases for age and sex, shown in fig-7.

**Table - 1**

<table>
<thead>
<tr>
<th>AGE</th>
<th>CASES</th>
<th>CONTROLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 - 29</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>30 - 39</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>40 - 49</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>50 - 59</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>60 - 69</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>70 - 79</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>80 - 89</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Total number of male patients was 145 and the total no female patients were 55 both in cases and controls table -2.

**Table- 2**

<table>
<thead>
<tr>
<th>Sex Distribution of cases and Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
</tbody>
</table>

The Serum Uric Acid levels in male cases ranged from 3.8 mg/dl to 9.8 mg/dl and female cases ranged from 3.2 mg/dl to 9.5mg/dl. The Serum Uric Acid levels in male controls ranged from 2.8 - 9 mg/dl and female controls ranged from 3 - 8.4mg/dl. The statistical analysis was performed using the SPSS 10.0 software package. The data was analyzed using the t-test (Independent sample t-test). SUA and risk between cases and controls The total number of cases were 200 (both male and female), the data analysis of the cases showed the mean SUA level to be 6.104 with a standard deviation of 1.576 (6.104 ± 1.576). The total number of controls of controls were 200 (both male and female), the data analyzed showed a mean SUA level of 5.685 with a standard deviation of 1.338 (5.685 ± 1.338), as shown in table 3.

**Table-3**

<table>
<thead>
<tr>
<th>SUA Levels between Cases and Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Cases</td>
</tr>
<tr>
<td>Controls</td>
</tr>
</tbody>
</table>

\[ t = 2.866, \ p = .004 \]

The t-value was found to be 2.866 and the p value = .004 which was significant. This showed that there was a significant rise in serum uric acid levels in patients with hypertension when compared to normotensive.

**SUA and risk for severity of hypertension:**

The severity of hypertension was divided into stage 1 and stage 2 based on the JNC VII classification of hypertension. In the study done at our hospital the
The total number of patients assessed to have stage 1 hypertension was 48 patients (both male and female patients), the total number of patients having stage 2 hypertension was 152 (both male and female patients).

The data analysis for SUA levels in the stages of hypertension showed a mean serum uric acid level in stage 1 hypertension of 5.0312 with a standard deviation of ±.77. The mean serum uric acid levels in stage 2 hypertensive patient were 6.4421 with a standard deviation of 1.615. The t-value was 8.213 and a p-value of .000 which was significant. The data analysed showed that there was a significant rise in hypertension in patients who were having stage 2 hypertension i.e. those with a SBP 160 and a DBP 100 than those with stage 1 hypertension (SBP 140-159 and DBP 90 - 99) table - 4.

Table-4

<table>
<thead>
<tr>
<th>Stage of Hypertension</th>
<th>Number</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>48</td>
<td>5.0312 ± .77</td>
</tr>
<tr>
<td>Stage 2</td>
<td>152</td>
<td>6.4421 ± 1.615</td>
</tr>
</tbody>
</table>

\[ t = 8.213, p = .000 \]

SUA and risk based on the duration of hypertension -

The duration of hypertension was divided into 2 categories - those with hypertension for duration of hypertension < 5 years and those with a duration of hypertension 5 years. The total number of patients with hypertension for duration of < 5 years was 96, and the total number of patients with duration of hypertension 5 years was 104. The mean SUA level in patients with hypertension < 5 years was 5.163 with a standard deviation of 1.255. The mean SUA level in patients with hypertension 5 years was 6.972 with a standard deviation of 1.326. The analyzed data showed a t-value of 9.891 and a p-value = .000 which showed that there is significant increase in SUA levels in patients with hypertension 5 years than those with a duration of < 5 years. Table - 5.

Table-5

<table>
<thead>
<tr>
<th>Duration of Hypertension</th>
<th>Number of patients</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5 years</td>
<td>96</td>
<td>5.163 ± 1.255</td>
</tr>
<tr>
<td>&gt; 5 years</td>
<td>104</td>
<td>6.972 ± 1.326</td>
</tr>
</tbody>
</table>

\[ t-\text{ value} = 9.891, p = .000 \]

Discussion:

Elevated SUA levels have been associated with an increased risk for cardiovascular disease. The potential mechanisms by which SUA may directly affect cardiovascular risk include enhanced platelet aggregation and inflammatory activation of the endothelium. In few studies, the association of SUA with cardiovascular disease was uncertain after multivariate adjustment as in the Framingham Heart Study (1985) and the ARIC study (1996), but in others the association remained certain and significant. Because elevated serum uric acid is correlated with several risk factors including renal dysfunction, hypertension, insulin resistance, hyperhomocystenemia and hyperlipidemia, it is debated whether SUA is an independent cardiovascular risk factor.

In the present study the incidence of hyperuricemia in controls was 17% and the incidence of hyperuricemia in cases was 37%. Various other studies have also shown that increased SUA levels were seen in hypertensive patients. Kinsey (1961) in his study with 400 hypertensive patients reported a 46% incidence of hyperuricemia in hypertensives. Kolbe (1965) in his study of 46 hypertensive patients found 26 to be having increased SUA levels (56%) 44.
A. Breckenridge (1966) showed 274 of 470 patients on antihypertensive treatment (58%) had raised SUA levels and 90 of the 333 patients (27%) attending the clinic for the time had hyperuricemia. In a study by C. J. Bulpitt (1975), 48% male hypertensives and 40% female hypertensives had their SUA level in the hyperuricemic range. Ramsay (1979) in his study of 73 men with untreated hypertension had 18 with raised serum uric acid levels (25%) 46. Messerli et al (1980) had an incidence of 72% raised SUA in their study population of 39 established hypertensives. Messerli and Frohlich et al hypothesized that the frequent presence of hyperuricemia in hypertensive patients reflects underlying renal dysfunction or reduced renal perfusion.

It certainly is possible that uric acid may be an earlier and more sensitive marker of decreased renal blood flow than serum creatinine. It has been recently suggested that since uric acid may play a role in the formation of free radicals and oxidative stress, the increased risk of hypertension in subjects with raised serum uric acid levels might be associated with this increased generation of free radicals.

Several observations support this concept of free radical mediated inhibition of endothelium dependent vasodilation. An antioxidant deficiency in diet which produces hyperuricemia, contributes to the etiology of hypertension, and the antioxidant drugs also show a blood pressure lowering effect in both diabetic and hypertensive patients.

In a study by Tykarski (1991), he showed SUA concentration and the prevalence of hyperuricemia were significantly higher in hypertensive patients. They further demonstrated that tubular secretion of uric acid was significantly lower in hypertensive patients in comparison with normotensive subjects. There was no difference in pre and post-secretory reabsorption of uric acid. They concluded that high prevalence of hyperuricemia in essential hypertension was caused by impaired renal excretion of uric acid. Goldstein and Manowitz (1993) showed in an adolescent population that, with age, weight, height and sexual maturity controlled, SUA significantly predicted blood pressure even in adolescents.

Three possible conclusions can be drawn from the association of hypertension with raised SUA levels. Hypertension may arise as a result of hyperuricemia, hypertension can cause hyperuricemia and the duration and severity of hypertension is related directly to the SUA levels. In gouty patients without advanced tophi, however renal failure and hypertension are rare. In a group of 80 patient's attending the Hammer Smith hospital gout clinic only 2 were hypertensive. In a study of gouty patients of Northern India by Kumar et al they found that only one out of 30 patients had hypertension. Fessel et al showed no appreciable loss of renal function in 112 patients with gout as compared to normal subjects followed up for 12 years. In a study by Lawrence E Ramsay there was no evidence that hyperuricemia had a deleterious effect on renal function. Canon et al considered that an impairment of renal function will raise the SUA levels more commonly than an increased SUA will cause renal damage.

Hence it is unlikely that hypertension arises as a result of raised SUA levels, but the possibility that uric acid which plays a role in the formation of free radicals and oxidative stress, the increased risk of hypertension in subjects with raised serum uric acid levels might be associated with this increased generation of free radicals.

Overproduction of uric acid can be measured by the rate of incorporation of acid precursors such as Glycine labeled N 15, into the uric acid pool. Such a study carried out in 4 hypertensive patients with raised SUA levels did not show any overproduction of uric acid. In the study of Breckenridge excretion of uric acid and uric acid clearance were lower in all hypertensive patients than in the normal group. When the uric acid clearance was expressed per 100ml of glomerular filtrate, there was no significant difference between normal subjects and hypertensive patients who had normal SUA levels, but the difference between those 2 groups and the hyperuricemic hypertensives was significant and they suggested a renal tubular abnormality in the handling of uric acid, the nature of the abnormality was not clear. Later Messerli et al
showed that hyperuricemia in hypertensive is due to early renal vascular involvement, namely, Nephrosclerosis. SUA rises because of impaired renal tubular function, which is the main site of regulation of SUA due to nephrosclerosis. Tykarski in his study showed that SUA levels in hypertensives are due to impaired tubular secretion of urate.

In the present study incidence and severity of hyperuricemia between cases and controls correlated significantly with the severity of hypertension. This correlated with both the Kinsey 43 and Breckenridge 1studies, but according to Cannon et al 53 severity of hypertension had no relation to SUA level. Our study agrees with the study of Tykarski et al in that there is a positive correlation between SUA and severity of hypertension47.

In our study the incidence of Hyperuricemia in cases with stage 1 hypertension was 4.2% and those with stage 2 hypertension was 42.11%. As to the possibility as to whether SUA levels was related to the severity and duration of hypertension, Breckenridge in his study showed an increasing incidence of hyperuricemia as the diastolic BP increased in his study, but there was no tendency for hyperuricemia to occur, only with patients with more severe hypertension.

Kinskey also found that hyperuricemia was common in patients with more severe grades of hypertension. Comparison showed that SUA increased significantly with duration of hypertension in our study. This was similar to the finding of Tykarski et al who encountered positive correlation between duration of hypertension and SUA in their study.

The PIUMA study demonstrates a strong independent association between SUA and CV risk in initially untreated and asymptomatic adult subjects with essential hypertension, but it is unable to answer the question of whether SUA exerts direct toxic effects. As extensively reviewed by Puig and Ruilope, 54 both uric acid and superoxide radicals are produced for the effect of xanthine oxidase in the late phase of purine metabolism. Superoxide radicals, which may cause tissue and vascular damage, 55 are increased in subjects with essential hypertension56. It would be important to clarify whether such increase is due, at least in part, to enhanced xanthine oxidase activity and whether inhibition of this enzyme by allopurinol may reduce CV risk57. In our study we found that there is definite relation in SUA levels between hypertensive patients and normotensive patients and there is a directly proportional relation in the levels of SUA in relation to the duration and severity of hypertension. Hence the possibility of serum uric acid acting by the production of free radicals and causing oxidative stress leading to hypertension and whether the duration and severity of hypertension lead to renal dysfunction in the form of nephrosclerosis leading to higher levels of serum uric acid has to be considered as various other studies have also show to have a positive relation in the SUA levels and hypertension.

Conclusion:

With the results based on the study carried out we concluded that there can be a direct relation between hyperuricemia and hypertension. Also the study showed that the SUA levels were significantly increased in patients with Stage 2 hypertension in comparison with those with stage 1 hypertension, showing that the severity of hypertension also related to the SUA levels. The study also showed that the duration of hypertension had a significant impact on the SUA levels, those with a longer duration of hypertension had significantly raised SUA levels when compared with those of a lesser duration.

Bibliography:

1. A. Breckenridge "Hypertension and Hyperuricemia" The Lancet 1966; 287: 15-18
Coagulation Profile in Menorrhagia of Child Bearing Age in Women of Odisha

G. Priyadarshini¹, S. Moharana², R. Mohanty³, A. Priyadarshini²

ABSTRACT

Background: Abnormal uterine bleeding accounts for almost 50% of visit to gynaecologists. Common conditions associated with menorrhagia include platelet function disorder and coagulation factor deficiency. Purpose of the study is to determine the frequency of underlying coagulation disorder as the cause of menorrhagia in child bearing age in women of Odisha.

Materials and Methods: A cross sectional study was done in a tertiary care institute over a period of one year. 30 women of child bearing age were included in the study. Each case was analysed for the demographic profile, duration of menorrhagia, severity of symptoms, degree of anemia and laboratory investigations.

Result: Mean age of patients was 39.57 years. A significant prolongation of aPTT, PT and decrease in platelet count haemoglobin and packed cell volume was seen in menorrhagic cases.

Conclusion: For evaluation of menorrhagia more emphasis should be given to rule out other hemostatic disorder. Menorrhagia may be considered as an inherited bleeding disorder.

Keywords: Menorrhagia, bleeding disorders

INTRODUCTION

Menorrhagia is one of gynaecological complaints seen in women of reproductive age. It is a public health challenge⁴. Insurance data and health care services research estimate that atleast 5-10% of women of reproductive age will seek medical attention for menorrhagia²,³.

The WHO estimates that 18 million women worldwide are affected⁴. Within a year of seeking medical attention, such a patient has upto 50% probability of undergoing surgical intervention⁵. Historically, the cause of menorrhagia have focussed on gynaecological & endocrinological conditions in terms of organic pathology & anovulation/hormonal imbalance, with remaining etiologies being systemic disorder such as hypothyroidism⁶ & iatrogenic causes including IUD & use of anticoagulants⁷.

Only in the past decade have underlying disorders of hemostasis been clearly recognised as an important etiological factor⁸. Historically, prior to extensive hemostasis testing in these patients, in approximately 50% of cases, no specific etiology was identified leading to diagnosis of exclusion of dysfunctional uterine bleeding (DUB)⁹. Coagulation disorders are prevalent in 1% of general population & their incidence may be as high as in gynaecological population⁸,¹⁰. Yet, gynaecologists underestimate the coagulation disorders in etiology of abnormal uterine bleeding⁸,¹¹.

A majority of the study in west report von Willebrand disease (vWD) as the most common inherited bleeding disorder which leads to menorrhagia whereas studies from south- east Asia have found platelet function disorder as the leading cause⁹,¹⁰. My aim of study is to find the cause of menorrhagia of Odia women in child-bearing age by correlating with coagulation profile.

MATERIALS AND METHODS

30 women visiting Obstetric & Gynecology OPD with complaints of menorrhagia without any etiological finding referred to Clinical Hematology of S.C.B Medical College, Cuttack were included in the study group & age matched. Ethical clearance was taken from Institutional Ethical Committee and each subject gave consent.

30 healthy female taken from paramedical staff were included in the control group.
Each case was evaluated for age of patient, age at menarche, clinical features, family history, drug history, menstrual history, quantity of bleeding and associated dysmenorrhea and other symptoms.

The laboratory investigations included evaluation of haemoglobin (Hb), packed cell volume (PCV), platelet count, bleeding time (BT), clotting time (CT), peripheral smear, prothrombin time (PT) & activated partial thromboplastin time (aPTT).

The inclusion criteria included all the females within the child bearing age who were referred to the hematology department from the Obstetrics and Gynaecology Dept. with the history of heavy irregular periods i.e when interval between start of cycle is <21 days or duration of menstrual flow is >7 days. Patients with gynaecological causes of menorrhagia, endocrine disorders and those who received treatment with anticoagulants, antifibrinolytics and NSAIDS were excluded from the study.

**METHODS**

Blood sample was collected within 1st - 4th day of menstrual cycle for blood coagulation tests. 2 ml EDTA blood was taken for complete blood count. 1.8 ml of 3.2% sodium citrate blood was collected for PT & aPTT estimation. Estimation of Hb, PCV, BT & platelet count was done by cell counter. Estimation of BT was done by Duke method & CT done by capillary tube method. PT & aPTT was estimated by coagulometer. The data was analysed by unpaired t test using SPSS version 16. All data were expressed as mean ± SD. The p value less than 0.05 was considered statistically significant.

**RESULTS**

Present study was conducted over a period of one year. During this period 30 patients were studied. Out of 30 patients 12 were in the age group of 36-40 years. Mean age of cases was 39.57 years and that of control was 41.21 years

**Table 1**: variation of age, menstrual cycle length & duration in menorrhagia cases & controls

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Menorrhagia (n=30)</th>
<th>Normal (n=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td>Mean + SD</td>
<td>Mean + SD</td>
</tr>
<tr>
<td></td>
<td>39.57 ± 5.35</td>
<td>41.21 ± 5.46</td>
</tr>
<tr>
<td>Menstrual Cycle (days)</td>
<td>18.6 ± 6.41</td>
<td>26.17 ± 2.73</td>
</tr>
<tr>
<td>Menstrual Duration (days)</td>
<td>7.33 ± 1.71</td>
<td>3.86 ± 0.74</td>
</tr>
</tbody>
</table>

Menstrual cycle length was significantly decreased and duration significantly increased in study group.

**Table 2**: variation of Hb, PCV, Platelet count, Bleeding time, Clotting time, PT and aPTT in menorrhagia cases and controls

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Menorrhagia (n=30)</th>
<th>Normal (n=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb (gm%)</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
</tr>
<tr>
<td></td>
<td>9.92 ± 1.44</td>
<td>13 ± 0.88</td>
</tr>
<tr>
<td>PCV (%)</td>
<td>34.51 ± 4.39</td>
<td>41.46 ± 2.69</td>
</tr>
<tr>
<td>Platelet count</td>
<td>196.07 ± 57.2</td>
<td>290.95 ± 0.17</td>
</tr>
<tr>
<td>X 10^3/mm^3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleeding Time (sec)</td>
<td>262.41 ± 6.22</td>
<td>154.67 ± 6.16</td>
</tr>
<tr>
<td>Clotting Time (sec)</td>
<td>588.46 ± 7.1</td>
<td>360.6 ± 8.47</td>
</tr>
<tr>
<td>PT (sec)</td>
<td>12.70 ± 0.93</td>
<td>12.02 ± 0.36</td>
</tr>
<tr>
<td>aPTT (sec)</td>
<td>27.08 ± 0.66</td>
<td>26.23 ± 0.43</td>
</tr>
</tbody>
</table>

Hb, PCV, Platelet count were significantly decreased in study group and bleeding time, clotting time, PT, aPTT were significantly increased in study group

**DISCUSSION**

Menorrhagia patients referred to clinical Hematology from Dept. of O & G who had no other Gynaecological finding belonged to age group 30-50 contrary to American Family Physician Study where the age group varied from 18-45 years. There was reduced Hb 9.92 gm% and PCV 34.51% due to decreased cycle length and increased duration of 7.33 days similar to Kishan et al 2011. Thrombocytopenia was idiopathic in nature correlating with the study of Bevan et al that caused increased bleeding time.
Clotting time was increased due to vWD as studied by Claessens and Cowell\textsuperscript{[14]}. The increase in prothrombin time and activated partial thromboplastin time was due to deficiency of Factor V, VII, XII, XIII as studied by Shankar et al \textsuperscript{[15]}.

**CONCLUSION**

Our study shows that the possibility of underlying haematological disorder in menorrhagic patients is high enough not to be ignored and so every patient with menorrhagia and Hb level <10 gm% should undergo detailed haematological investigation.

**REFERENCES**


---

**RSSDI ODISHA - 2014**

13th September (Saturday), 2014
Venue: IMA House, Rourkela
Scientific Programme by National & State Faculties

*Contact Details:*

**Dr. Satyen Kar**
Organising Secretary
**Dr. Sajan Agrawal**
Organising Chairman
Ormeloxifene in Treatment of DUB

S. Swain1, B. Mallick2

Abstract:
Objective:
To evaluate the efficacy of Ormeloxifene (A Selective Estrogen Receptor Modulator) for the treatment of dysfunctional uterine bleeding

Method:
A observational study on 100 subjects as per their PBAC score, hemoglobin percentage and endometrial thickness using Graphpad Instat 3 software by Student's t test, Chisquare test, Normality test & Kruskal-Wallis Test.

Results:
Ormeloxifene is comparatively more efficacious and less expensive than other available medical & surgical methods employed for t/t of DUB. The reduction in mean blood loss is 66% than pre treatment (p<0.0001). it is also cost effective . importantly it has no carry over effect.

Conclusion:
Ormeloxifene should be preferred as medical treatment in women who prefer non-steroidal treatment, wish to preserve fertility and in whom steroidal treatment is either not recommended or not desired. It is also a good option for women in the adolescent or peri menopausal age group. For young women who desire contraception , this is definitely a better choice.

Keywords: menorrhagia, ormeloxifene

Introduction:
Every woman at least once in her life time faces the problems of excessive or irregular menstruation. Menorrhagia, or hypermenorrhea, is defined as excessive menstrual bleeding. The prevalence of menorrhagia in the general population is approximately 9-11%. About 5% of women between ages 30 and 49 years consult their general practitioners, and 12% of referrals to the gynecologist are for menorrhagia.[1]

For diagnostic purposes, menorrhagia is defined as objective blood loss exceeding 80 mL/cycle[2] or menses lasting longer than seven days, although the term is often used more generally to describe excessive bleeding as perceived by the patient. Quantifying the amount of menstrual loss objectively is impractical and unnecessary.[2,3,4] Typically, one has to rely on the patient’s subjective complaint and proceed with evaluation. It is a highly unreliable method and often full of inaccuracies. Several laboratory techniques have been described attempting to quantify blood loss, but it is a cumbersome and time-consuming process.[5,6,7,8]

Women wants to conserve her uterus and retain menstrual and fertility functions. Ormeloxifene a a SERM is best known as a non-hormonal, non-steroidal oral contraceptive ,is taken once per week. It has proved its mark as an anti osteoporotic agent, in advanced breast cancer in carcinoma cervix and as an immunomodulator.

Materials and Methods:
This study was conducted in the department of obstetrics & gynaecology of S.C.B. Medical College, Cuttack during the period of July 2010- Dec2012. It is a longitudinal observational type of study where subjects recruited were followed up for a period of nine months. The Institutional Ethical Committee , S.C.B Medical College granted permission for the study.

Inclusion criteria:
Confirmed cases of dysfunctional uterine bleeding, reproductive age group (20-50yr.), parous, a normal endometrial histo-pathological report wherever required.

Exclusion criteria: Pregnancy and lactation, fibroid uterus, polycystic ovarian disease, cervical dysplasia, jaundice or hepatic impairment, renal
pathology / impairment, tuberculosis, severe allergic reaction, h/o any coagulopathy Informed consent was taken from the subjects.

Subjects thus recruited were advised for base line hemoglobin and transvaginal scan for any pelvic pathology and endometrial thickness.

These patients were then prescribed ormeloxifene 60mg oral tablet to be taken twice weekly ( for e.g Monday & Thursday) for first 12 weeks then 60 mg once weekly for next 12 weeks. After 6 months of use subjects were asked to discontinue the drug but were kept on follow up for the next 3 months. In the mean time patients were followed up over telephone.

• Subjects were advised a particular brand of sanitary napkin for the study period and were provided with PBAC (pictoral bleeding assessment chart) for 3 months.

• Assessment of blood loss was done by subjective assessment & objective assessment by PBAC scoring, haemoglobin percentage & sonographic estimation of endometrial thickness is done every 12 week

FOLLOW UP : Every 4 weeks by telephone & every 3 monthly at OPD. Pre treatment 2 cycles were compared with the next 6 cycles with treatment & 3 cycles post treatment.

Results :

The sample studied was randomly recruited from the confirmed cases of DUB. The study sample consisted of 100 subjects.

In this study 48 subjects belonged to the age group 31-40 yrs (48%) while 42% subjects were of age group 41-50 yrs & rest 10% were of age group 21-30 yrs

PBAC scoring -94% subjects responded to the drug as is evidenced by decrease in mean blood loss (MBL). Out of the rest 6, 67% belonged to 41-50 years while 33% belonged to 21-30 years age group. In these patients diagnostic hysteroscopy was done and in both cases endometrial polyps were found and resected. There is a decrease by 90.58% of MBL of the pre treatment level at 6 months of continuous use.

In the said study 66% women were of parity <=2, out of them, 63 women (95%) responded to ormeloxifene. Rest 34% had parity >2, of which 91% responded to ormeloxifene, 6 months therapy.

The subjects of age group 41-50 yrs show the maximum response in terms of a decrease of MBL by 94.89% at 6 months. the mean PBAC score pre t/t 449.71. The minimum was 100 & maximum score was 772. After 24 weeks of treatment with ormeloxifene the mean PBAC score became 32.43, the minimum score was 0 & maximum score was 384. The P value is < 0.0001, according to ANOVA, considered extremely significant. Variation among column medians is significantly greater than expected by chance.
### Table 1 Outcome in Women of Age Group 41-50 Yrs in Terms of PBAC Score:

<table>
<thead>
<tr>
<th>Col. title</th>
<th>pre t/t</th>
<th>12 week</th>
<th>24 week</th>
<th>Post treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>449.71</td>
<td>83.21</td>
<td>32.43</td>
<td>194.09</td>
</tr>
<tr>
<td>Standard deviation (SD)</td>
<td>189.90</td>
<td>89.50</td>
<td>63.38</td>
<td>257.64</td>
</tr>
<tr>
<td>Sample size (N)</td>
<td>42</td>
<td>42</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>Std. error of mean(SEM)</td>
<td>29.302</td>
<td>13.810</td>
<td>9.780</td>
<td>39.755</td>
</tr>
<tr>
<td>Lower 95% conf. limit</td>
<td>390.53</td>
<td>55.318</td>
<td>12.674</td>
<td>113.79</td>
</tr>
<tr>
<td>Upper 95% conf. limit</td>
<td>508.90</td>
<td>111.11</td>
<td>52.183</td>
<td>274.40</td>
</tr>
<tr>
<td>Minimum</td>
<td>100.00</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Median (50th percentile)</td>
<td>441.50</td>
<td>59.000</td>
<td>7.000</td>
<td>65.000</td>
</tr>
<tr>
<td>Maximum</td>
<td>772.00</td>
<td>402.00</td>
<td>384.00</td>
<td>768.00</td>
</tr>
<tr>
<td>Normality test KS</td>
<td>0.08891</td>
<td>0.1865</td>
<td>0.2807</td>
<td>0.2854</td>
</tr>
<tr>
<td>Normality test P value</td>
<td>&gt;0.10</td>
<td>0.0008</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Passed normality test?</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

In the age group of 21-30 year, pre treatment mean PBAC score was 238. The minimum pre t/t PBAC score was 148 & maximum was 336. Similarly the PBAC score at 24 weeks with treatment, was a minimum 0, maximum 306 and a mean of 70.9. It failed the normality test and the p value calculated was highly significant i.e 0.0085. The ANOVA test clarified the same finding.

In the age group of 31-40 year, pre treatment mean PBAC score was 364. The minimum score was 100 & a maximum score was 786. The PBAC score at 24 week was a minimum 0, maximum 88 and a mean 32.59. It failed the normality test and p value was < 0.0001 as per ANOVA, considered extremely significant.

**Figure-3 Outcome Measurements-comparision of Pbac Scores of 100 Pt. at Pre T/T 12weeks, 24 weeks & Post T/T**

![Chart Title](chart.png)
Overall the pre treatment PBAC score was 389.03. Chi-squared Test for Independence as compared to the three age groups showed Chi-square: 54.206 & Degrees of Freedom: 2. The P value is < 0.0001 i.e very significant.

At pre t/t and 12 weeks it was seen that, there was a statistically significant decrease in mean blood loss at the end of 12 weeks. The p value was 0.001 and is significantly greater than expected by chance. On continuing the drug up to 24 weeks the subjects had a further decrease in mean PBAC score, p value, 0.001. Overall the drug reduces the mean blood loss while treatment is continued i.e. up to 24 weeks and its effects persist even after the drug is withdrawn. The data has the p value<0.0001, i.e. it is extremely significant. Kruskal-Wallis Test (Nonparametric ANOVA) confirms that p<0.0001 and therefore extremely significant.

In terms of parity, subjects with 2 or less viable births showed the same pattern as subjects with 3 and more viable births. Thus there is no significant variation in these subjects in terms of parity.

Raise in hemoglobin percentage The mean difference of hemoglobin at 6 months from that of pre treatment level is 1.4811. The P value is < 0.0001, considered extremely significant indicating that the drug is efficient in treating menorrhagia.

Endometrial thickness The mean difference in endometrial thickness pre treatment and at 24 weeks is 1.608 cm. The P value is < 0.0001, considered extremely significant. Thus ormeloxifene leads to endometrial atrophy. All the parameters measured failed the normality test.

Subjective assessment Pre treatment, out of 100 patients 36 had heavy bleeding and 63 had very heavy bleeding. Majority with heavy bleeding belonged to the age group of 41-50 yrs (15) while a majority with very heavy bleeding belonged to 31-40 yrs (36).

Table 2 Subjective Assessment of Menstrual Blood Loss:

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>NIL</th>
<th>LIGHT</th>
<th>AVERAGE</th>
<th>HEAVY</th>
<th>V. HEAVY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE T/t</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>36</td>
<td>63</td>
</tr>
<tr>
<td>12 WEEKS</td>
<td>04</td>
<td>25</td>
<td>43</td>
<td>26</td>
<td>2</td>
</tr>
<tr>
<td>24 WEEKS</td>
<td>21</td>
<td>55</td>
<td>20</td>
<td>04</td>
<td>0</td>
</tr>
<tr>
<td>POST T/t</td>
<td>06</td>
<td>36</td>
<td>24</td>
<td>16</td>
<td>18</td>
</tr>
</tbody>
</table>

The safety profile- 35% of subjects were highly satisfied with the drug. Only 18% of the subjects opted for hysterectomy after taking the drug. When considered amenorrhoea is the single most troublesome side effect. Other side effects were cystic ovary (11%), gastritis (19%), head ache (15%) & recurrent menorrhagia (20%) while 6% were non responders.
In the age group 21-30 yrs the most common side effect was seen to be head ache. In the age group 31-40 yrs the most common side effect was gastritis and the same in 41-50 yr age group was amenorrhoea.

Discussion:

The study established an incidence of menorrhagia was 42% in the age group of 41-50 yrs, 48% in the age group of 31-40yrs, & 10% in the age group of 21-30 yrs. Horn S D, Prather S in a cohort analysis of perimenopausal women reported incidence of DUB in the range of 5-15% of the whole population. Marlene B, Maureen Hatch et al in an English study reported an incidence of DUB of 9-14% in reproductive age group and 7 per 1000 women in perimenopausal women.

In the study it was seen that 94% of the subjects responded to the drug as is evidenced by the reduction in the PBAC Score. 6% were non-responders. Alka Kriplani[9] et al had 16.7% & Biswas et al[10] had 12.9%. Dhananjay BS and Sunil Kumar Nanda,[11], et al did not report of non responders in their study. Out of the 6 subjects who did not respond to the drug, 5 went for hysterectomy, during follow up.

In the said study 66% women were of parity <=2, out of them, 63 women (95%) responded to ormeloxifene in terms of PBAC scoring. Rest 34% women had parity >2, of which 91% responded to ormeloxifene, 6 months therapy.

Overall the pre treatment PBAC score was 389.03 & at 24 week 36.63 and post treatment it was 174.42. Chi-squared Test for Independence as compared to the three age groups showed Chi-square: 54.206 & Degrees of Freedom: 2. The P value is < 0.0001 i.e. very significant. Biswas Subas Chandra et al. found the mean pre t/t Hb% was 9.42gm%, post t/t Hb% was 10.057 gm%. Normality test P value 0.0081 pre t/t & <0.0001 post t/t. it did not pass the normality test. One-way Analysis of Variance (ANOVA). The P value is < 0.0001, considered extremely significant. Biswas Subas Chandra et al. found the mean pre t/t Hb% was 9.42gm%, post t/t Hb% was 10.057 gm%. The mean difference was 1.31. Kripnani A et al found a raise of 0.6gm% at the end of four months of treatment with the drug (p value =0.003). Dhananjay BS et al found Hb g/dl (Min-Max). Pre-treatment = 6.50-9.80, Post-treatment = 9.60-11.50, 95% confidence interval & P value <0.001.
The third outcome measured was endometrial thickness. The mean pre treatment endo echo was 9.07 cm, with the range of 3.8 cm to 13.4 cm while post t/t endometrial thickness was 7.462 cm with the range of 3.0 to 12.00 cm. It failed the normality test. According to Kruskal-Wallis Test the P value is < 0.0001. Biswas et al showed a reduction in endometrial thickness in 85.7% of the study population. Dhananjay BS et al found that, mean endometrial thickness pre t/t was 8.36cm ranging from 4.20-14.40 cm while post t/t endo echo showed a mean thickness of 4.89 cm ranging from 2.00-9.00cm. The p value was <0.001. 

Amenorrhoea by Subas Biswal et al, was 17.64%, in the study group while in the present study it was 20%. Alka Kriplani et al found that 42.9% subjects had amenorrhoea.

The phase III trial of the drug as well as clinical trial conducted by V.P.Khamboj et al had described delayed cycles i.e oligomenorrhoea and scanty flow as side effects that improves with continuous use over a period of three months. In contrast to the above findings the trend of amenorrhoea is on persistent raise. This may be due to the increased dosage of the drug i.e. 60 mg being used and thus the prolonged anti estrogenic activity of the drug on endometrium. Though there is significant reduction in endometrial thickness with treatment, this study fails to find any correlation in endometrial atrophy and amenorrhoea( cut off value of endometrial thickness taken as 5mm). In a comparative study of efficacy of tranexamic acid and ormeloxifene, by Dr. Subhas Chanda Biswas, Dr. chaitaii Datta Roy, Dr. Ram Prasad Dey et al amenorrhoea is described as an untoward event of ormeloxifene.

It was seen that women belonging to 41-50 years contributed 70%, 31-40 yrs contributed 25% and 21-30 yrs contributed 5%. Thus women belonging to the older age group developed amenorrhoea more frequently than younger women. It agrees with that of Biswas et al and Alka Kriplani et al.

The other side effects seen in the study subjects were cystic ovary(11%), gastritis (19%), head ache(15%), recurrent menorrhagia(20%), non responders (6%) and patients opting for hysterectomy (18%). 35% of subjects had no complains at all. Same with drugs like tranexamic acid[Gleeson NC, Callender ST], NSAIDs (Fraser , Vargyas JM) coincides as these agents also donot have any carry over effect. MBL returned to pre treatment levels on the 1st cycles as the drugs were discontinued.

Biswas et al described amenorrhoea in 17.64% subjects & 2.1% subjects had gastritis. Alka Kriplani et al showed 7.1% subjects had cystic ovary, 7.1% had cervical erosion, 4.8% had gastric dyspepsia 4.8% complained of head ache.

The development of menorrhagia after discontinuation of the drug indicates that the drug has no carry over effect. Studies on tranexamic acid and NSAIDs by Fraser et al Vargyas et al gives similar results where menstrual blood loss returns to pre treatment level on 1st cycle after discontinuation of the drug. Scahlaff WD et al [22]showed similar results with GNRH analogues.

None of the studies till date had considered the carry over effect of the drug. Considering it & the side effects the drug seems relatively safer. 35% subjects had no side effects. Amenorrhoea was complained by 6% subjects only while Alka Kriplani's Pilot study shows 42.9% subjects developed amenorrhoea and Biswas et al found that 17.64% of his subjects had amenorrhoea.

The post treatment mean PBAC Score was 174.4 with a range of 0 to 782. Out of the 100 subjects taken in, 6 subjects the PBAC Score increased to more than the pre treatment value.

Conclusion :

Medical treatment of DUB aims to relieve symptoms, improve quality of life & avoid risk of surgery. Despite a decrease in MBL 50% women remain menorrhagic when treated with NSAIDS and Progesterone[23] and many are non compliant due to daily dosing. In this scenario ormeloxifene evolved as a near ideal drug in control of menorrhagia. Like other SERM, it has a long lasting estrogen antagonistic action. Its long half life provides basis for a weekly dosing schedule[24]. Also it has protective effect on breast and endometrium. In some cases it has found to be causing cystic changes in ovaries. It has been proved in this study that ormeloxifene is a highly efficacious drug in decreasing MBL. But the problem here is amenorrhoea that developed in a large group of subjects
6% at the end of the study. Better toletated in perimenopausal women. Besides the drug being a SERM is also beneficial as contraceptive in preventing post menopausal bone loss, improving lipid profile, donot increase the risk of breast cancer infect it is used as an anti cancer agent in ca breast, as HRT , as a fertility and implantation predictor and as a treatment modality for cervical cancer.

Recurrence of menorrhagia after discontinuation of the drug needs further extensive population based studies.

References :
11. Dhananjay BS and Sunil Kumar Nanda., Role of sevista in management of Dysfunctional uterine bleeding ID: JCDR/2012/4794:2411
12. Dr. Subhas Chanda Biswas, Dr. chaitaii Datta Roy, Dr. Ram Prasad Dey et al compared the efficacy of Ormeloxifene & tranexamic acid
Superioly Based Nasolabial Flap is a Good Alternative for Moderate Buccal Mucosal Defect with Preserved Mandible.

S.P. Mishra

Abstract:

Background

The superiory based nasolabial flap is a simple flap used for reconstructing small to medium buccal mucosal defects created after wide excision of benign/malignant lesion.

Methods:

A retrospective analysis of 22 cases of buccal mucosal cancer treated with primary excision and nasolabial flap reconstruction. The excision was combined with neck dissection and facial artery ligation. The nasolabial flap is superorly based, in most of the cases vascular pedicle is visualised under loupe magnification.

Results:

Good cosmetic and functional results were obtained in almost all cases. Partial Wound dehiscence developed in one patient.

Conclusions

The nasolabial flap is a good flap for the reconstruction of medium buccal mucosal defects after wide excision of primary tumors and results in good overall cosmetic and functional outcome.

Background

Several methods described for reconstruction of buccal mucosal defects, either with pedicled or free flaps. The pectoralis major flap, a pedicled flap, may be used for this purpose. However, this flap is bulky and is associated with considerable donor site morbidity. In presence of mandible there is chance of vascular compromise. Likewise, the radial forearm free flap has also become a preferable reconstruction method. It offers a large surface of thin, pliable skin that allows for complex reconstruction, but unfortunately donor site morbidity rates are quite high, for example, through delayed wound healing and exposure of tendons. In old age groups there is chance of atherosclerosis. The need of microsurgical expertise is a major disadvantage [1]. This makes nasolabial flaps ideal for reconstruction of small to moderate intraoral defects. The nasolabial flap is a very simple flap used for reconstruction of intraoral defects in the floor of the mouth [2,3], the tongue, cheek, commissures [4], nose tip, nasal ala, and lower eyelids [5]. The nasolabial flap may be superiorly or inferiorly based. An inferiorly based flap is useful in reconstruction of the lip, oral commissure, and anterior aspect of the floor of the mouth, while superiorly based flaps are utilized for reconstruction of the ala and tip of the nose, and the lower eyelids and cheeks. Here in this paper I prefer superiorly based nasolabial flap because of following advantages like, availability of tissue for reconstruction is wide as distal part of flap is wide, base is narrow which facilitates easy twisting, vascularity of flap is well assured. The choice of pedicle is based on the site of the defect and any need for rotation or advancement of tissue to the site of the defect [5]. The flap may be thick or thin, depending on the requirement of the defect and the thickness of the donor tissues. Intraoral reconstruction with a nasolabial flap is a simple and fast procedure with minimum donor defect and complications. This article reviews our experience with superiorly based nasolabial flaps in the reconstruction of moderate intraoral defects. The defect is mostly from upper gingivo buccal sulcus to lower gingivo buccal sulcus.

Methods

Between 2012 and 2013, 22 patients with oral cancer underwent reconstruction of oral defects using nasolabial flaps. A primary tumor was located in the buccal mucosa in 15 patients, the alveolus in 4 patients,
and the commissure and lip in 2 patients, in one patient defect was extended from entire buccal mucosa to angle of mouth. Data were collected from the patients' operating records and were retrospectively analyzed. Being a retrospective study, this study was exempt from the Institutional Review Board; however, each participant gave written informed consent to use data and photographs for publication.

**Anatomical considerations**

The nasolabial flap is an axial flap but may be utilized as a random flap [4]. The flap receives its blood supply from the angular artery (a branch of the facial artery), the infraorbital artery, and the transverse facial artery (branch of sup. temporal artery) [6]. This rich vascular anastomosis between all the feeding vessels makes it an ideal and versatile flap for reconstruction of the anterior floor of mouth, lips, and nose tip; hence, superiorly, inferiorly, lateral, or medial based flaps can be raised [5]. The nasolabial flap can also be used as an interpolation flap in either a single or a staged technique. Disadvantages of the nasolabial flap are that there is a limited amount of tissue available, the reconstruction may lead to asymmetry, and a 'pin-cushioning' effect of the cheek can occur when the flap is used for intraoral reconstruction. Here I mainly used superiorly based nasolabial flap, where blood supply is mostly through branch from angular artery & transverse facial artery. Hence versatility of flap is assured.

**Technique**

The flaps are elevated directly under vision; the plane is deep to the subcutaneous tissue and superficial to the underlying muscles [7]. During dissection, the facial artery, submental artery, and external jugular vein are ligated if the neck dissection is combined with the resection of a primary tumor in a clinically node-positive neck. For all of our reconstructions, superiorly based flaps were utilized (Figure 1). The base of the flap was extended to a point approximately 15 mm distal to the medial canthus, while the width depended upon the width of the defect. If the facial artery was preserved, a width to length ratio of 1:3 was maintained. In cases where the facial artery was ligated, a ratio of 1:2 was maintained in case of random flap. In our study feeding vessels were seen under loupé magnification, hence it became an axial flap. After the flap was raised to the desired extent, it was rotated inwards and insetted using 4/0 Prolene® sutures. The mucosal part of the flap was sutured using 3/0 Monosyn/vicryl. Using loupé magnification the feeding vessel was identified so that flap became a pedicle flap. When used for commissural defects, a V-Y commissuroplasty was added as a second-stage procedure.

Clinical photographs showing surgical procedure for inserting nasolabial flap

(A) Lesion seen

(B) Defect after Excision-

(C) Lateral profile, showing incision incision line

(D) Front view of the incision.
Technique of nasolabial flap insetting using a tunnel

For reconstruction of the buccal mucosa, lower alveolus, tongue, or floor of the mouth where no incision was made on the lips, the flap was insetted using a buccal tunnel [8], which is usually near medial canthus. After 3 weeks, the flap was divided and the tunnel was closed (Figure 2). Depending upon the situation de-epithelialisation done & primary closer of tunnel was done. In some cases I preferred to deepithelise in the tunnel part of flap so that after cutting the flap from base closure will be easy.

Results

Patient characteristics

Of 22 patients, 15 were men and 7 women. The site of the primary tumor was the buccal mucosa in 15 patients, the lip with commissure involvement in two patients, and the lower alveolus in four patients & in one patient the defect extended from buccal mucosa to angle of mouth.

All the patients had T2 or T3 disease with N0/N1/N3 status on clinical examination and computed tomography and two of them received neoadjuvant radiation. Excision of the primary tumor was combined with neck dissection in 22 cases. In all 22 patients, the facial artery was dissected and ligated. In 15 cases this was achieved by intraoral excision, otherwise it was achieved through lip split. Only seven patients received postoperative adjuvant radiotherapy. Follow-up ranged from 1 year to 6 years, and no patient was lost to follow-up.

Total No. : 22, Sex : 15m/7f, Site of lesion : Bucalmucosa, Procedure done : W.L.E., Reconstruction done : N.L.Flapp, Result : Good, Complication : Nil, Outcome : Satisfactory

The cosmetic and function results were good in nearly all the patients (Figure 3). One patient developed partial wound dehiscence. Apart from these, one patient developed wound infection requiring prolonged nasogastric feeding and antibiotic administration. The final outcome was good in all cases, except one patient, who developed wound dehiscence which healed secondarily. None of these developed trismus. No nodal failure was encountered. After the flap was healed, all the patients with T3 lesion received radiotherapy to primary and neck.
Discussion

The versatility and usefulness of the nasolabial flap is well known [9]. The flap has a good vascular supply; hence, survival is high [10]. An abundant blood supply allows for a length to breadth ratio of 3:1. The flap is good for small and intermediate, large (T1 to T4) intraoral defects. The blood supply of the nasolabial flap is attributed mainly to the facial artery. However, this artery was ligated in the neck dissection in some of our cases without any adverse effect on the viability of the flap, indicating that it may not be the facial artery but is more probably the rich subdermal plexus that supplies the skin flap [11]. The fact that this flap withstands radiotherapy signifies its excellent vascularity. In superiorly based flaps, feeding vessels are mainly from angular artey, one branch from infraorbital artery & one branch from transverse facial artery, a branch from superficial temporal artery; feeding vessels are seen by loupe magnification. Above all subdermal plexus has got definitive role.

The disadvantage of this method of reconstruction is the need for a second-stage procedure in some of the cases, where a buccal tunnel is used for insetting the flap or a second-stage commissural correction is required. These procedures are minor and so can be done under local anaesthesia. Bulk of flap is less. There will be a scar mark in the nasolabial fold of face, scar is seems to be minimal as it is in the nasolabial fold; however scar can be minimised by different medications & avoiding sun exposure for initial six weeks.

There may be other problems, such as cheek biting or a bulky base of the flap passing over the alveolus, causing problems in those wearing dentures, especially when the flap is used to repair alveolar defects (Figure 2). Dental implants may provide a good solution to this problem. Possible post-reconstruction outcomes are flap necrosis due to hematoma, infection, or tension on the suture line, where further surgery may be required. Although rare, one may encounter wound complications and partial or total reconstruction failure owing to insufficient arterial flow or venous drainage [12]. Flap survival depends on the early recognition of flap compromise, such as ischemia and necrosis. Smoking is also associated with an increased risk of flap failure because smoking has deleterious effects on flap survival by aggravating hypoxemia and vasoconstriction. Hematoma may result from inadequate hemostasis and drug-induced coagulopathy, hence medications inducing coagulopathy, for example, acetylsalicylic acid and non-steroidal anti-inflammatory drugs and vitamin E, should be avoided at least 2 weeks before and 1 week after surgery. Hematoma formation may reduce tissue perfusion and can lead to ischemia and necrosis by inducing vasospasm and stretching of the subdermal plexus or by separating the flap from its recipient bed [5].

Congestion is the most common problem associated with facial flaps. Venous congestion can lead to arterial compromise and flap necrosis. Infection can also complicate flap healing. The postoperative wound infection rate is 2.8% for facial surgery, with higher rates in facial reconstruction using local flaps. The use of flaps for reconstruction may interfere with the normal sensation and neurological afferent control that provides sensory guidance to speech and swallowing. Furthermore, especially in men, if a flap is taken from hair-bearing skin to reconstruct a surgical defect, then that area of tissue will continue to grow hair. This can be prevented by outlining the flap. It can also be seen that postoperative radiotherapy may decrease the growth of hair and ultimately lead to mucosalization of the flaps. There may also be a pincushioning effect around the nasolabial folds, which could be avoided by using a rhomboid design [13]. An ipsilateral inferiorly based nasolabial flap can cover small defects up to 2 cm but if a larger defect of size approximately 5 × 5 cm or more is to be reconstructed, a superiorly based nasolabial flap & in selective cases bilateral nasolabial flap can be utilized successfully. It is important to note that when a superiorly based nasolabial flap used, the availability of tissue is more wider which is near angle of mouth. Base of flap is near medial canthus hence play of flap is quite handy. As there is definitive feeding vessel hence versatility of flap is well assured. As distal portion of flap is quite wide hence hence a wider defect of buccal mucosa can be reconstructed. As the base of flap is narrow, hence tunnel is narrow & part of in the tunnel part can be deepithelised to avoid a persistent fistula at the base of flap.
Conclusion

The nasolabial flap is versatile for covering or reconstructing small to medium sized defects of the oral cavity in selected patients in preserved mandible & ligated facial artery following neck dissection. However, this type of reconstruction is also suitable when teeth are present in the area to be reconstructed and biting on the pedicle can be avoided by placing a small pack in between because there is early postoperative oedema of flap. As even small defects require reconstruction, the nasolabial flap has proven to be a useful and reliable alternative without causing much morbidity to the donor site. For smaller defect inferiorly based, but for wider defect superiorly based nasolabial flap is definitely a good alternative. Scar mark is along nasolabial fold. Scar mark can be minimised by application of different skin applications.

References

Choline (C5H14NO=104.17), a trimethylated nitrogenous base, is a water-soluble essential nutrient. It is usually grouped within the B-complex vitamins. In the body, choline enters three major metabolic pathways (i) phospholipids synthesis via phosphorylcholine, (ii) acetylcholine synthesis, and (iii) oxidation to trimethylglycine (betaine) which participates in the S-adenosylmethionine (SAMe) synthesis pathways. Choline is present in the head groups of phosphatidylcholine and sphingomyelin, two classes of phospholipids that are abundant in cell membranes. Choline is the precursor molecule for the neurotransmitter acetylcholine which is involved in many essential functions of the body, including memory, cognitive function, neuromuscular transmission, contraction of the skeletal muscles, digestion, and respiratory and cardiovascular functions. Choline is also a methyl donor and is also used by the body to decrease elevated levels of homocysteine. This function may lend it the title of "antioxidant", as homocysteine is correlated to an increase in damage from free radicals and oxidative stressors.

Choline must be consumed through the diet in order for the body to remain healthy. It is used in the synthesis of the constructional components in the body's cell membranes. Despite the perceived benefits of choline, dietary recommendations have discouraged people from eating certain high choline foods, such as egg and fatty meats. The 2005 National Health and Nutrition Examination Survey stated that only 2% of postmenopausal women consume the recommended intake for choline.

Choline was discovered by Adolph Strecker in 1864 and chemically synthesized in 1866. In 1998 choline was classified as an essential nutrient by the food and Nutrition Board of the Institute of Medicine (USA). Choline's importance as a nutrient was first appreciated in the early research on insulin functions when choline was found to be the necessary nutrient in preventing fatty liver. In 1975 scientists discovered that the administration of choline increased the synthesis and release of acetylcholine by neurons. These discoveries lead to the increased interest in dietary choline and brain function. Today, we know Choline to be a dietary nutrient important for all cells to function normally. Choline is required for synthesis of essential components of membranes and is an important source of labile methyl groups.

A recent study in Nov. 2010 by Leslie M. Fischer, Kerry-Annda Costa, Lester Kwock, Joseph Galanko, and Steven Zeisel was to test postmenopausal women with low estrogen levels and see if they were more susceptible to the risk of organ dysfunction if not given a sufficient choline filled diet. When deprived of choline in their diet almost 80% of the men and postmenopausal women developed liver or muscle damage. The study also found that young women can supply more choline because pregnancy is a time when the body's demand for choline is highest. Choline is particularly used to support the fetus's developing nervous system.

Citicoline (or CDP-choline), a compound normally present in all cells in the body, is both a neuroprotective drug, when administered exogenously, and an intermediate in membrane phosphatide biosynthesis. After oral administration, the bioavailability is 100%. Citicoline has shown different pharmacological actions, with beneficial effects in some models of cerebral ischaemia and synergistic effects with other drugs tested in the treatment of brain ischaemia.

L-Alpha-glycerylphosphorylcholine is the richest source of choline. The absolute bioavailability being 40% from Alpha GPC.
Clinical Profile

Pharmacokinetics :

De Moliner et al (1993) conducted a pharmacokinetic study of intramuscular (i.m), intravenous (i.v.) and oral closing with alpha GPC in healthy adults. Four healthy volunteer subjects aged 19-24 years received Alpha GPC 1000 mg by i.v., then subsequently by i.m., then by mouth, then received a placebo by mouth, in four separate sessions separate sessions separated by one-week washouts. During each session blood was sampled periodically over 10 hours. With i.v. administration of Alpha-GPC, plasma total choline peaked at 5 minutes and returned to baseline by 4 hours. With i.m. administration, plasma total choline peaked at 0.5 hours and returned to baseline by 6 hours. With oral Alpha-GPC, plasma total choline peaked at 3 hours, at a concentration slightly less than half that reached by i.m. administration. But with oral GPC the plasma total choline remained above baseline at 10 hours. The investigators concluded that i.v. and i.m. Alpha-GPC both delivered virtually identical total plasma does (AUC, Area Under the Curve), and that oral administration delivered about half this amount. Alpha-GPC has rapid absorption (88%) on oral administration. 85% excretion takes place in the form of CO2 and 15% by kidney.

Citicoline (or CDP-choline) has been extensively studied in > 11000 volunteers and patients with various neurological conditions. The first well designed clinical trials in acute stroke patients showed positive results, but the sample size of these studies was small. In the 1990s, the clinical development of citicoline for the treatment of acute ischaemic stroke was initiated in the United States.

The first US phase II to III trial was conducted to evaluate the effect of 3 doses (500, 1000, and 2000 mg/d) of citicoline versus placebo, Citicoline treatment at 500 and 2000 mg/d demonstrated significant improvement of

- Neurological (National Institutes of Health Stoke Scale (NIHSS)
- Functional (Barthel Index B1 and
- Global (modified Rankin Scale (mRS), outcomes compared with placebo 12 weeks after stroke onset.

In the second study, treatment with citicoline 500 mg showed significant benefits in a subgroup of patients with moderate to severe strokes (baseline NIHSS > 8) in terms of functional recovery (B1 > 95) compared with placebo. The last trial was designed to confirm the effect of citicoline 2000 mg/d on neurological and functional outcomes of patients with moderate to severe acute ischaemic stroke. This study did not demonstrate significant differences in the primary end point (? 7-point improvement in NIHSS score)

The Studies concluded that Citicoline

- Increases endothelial progenitor cells (EPCs) in ischemic stroke
- Enhances brain plasticity
- Improves sensorimotor recovery in the chronic phase of stroke
- Demonstrates neuroprotective properties
- Offers substantial progress in consciousness as early as day 3
- Renders greater probability of complete recovery
- Besides marked enhancement of cognitive functions Citicoline improves the EEG patterns & lessens the slow wave activity that typically becomes more prevalent with aging or pathologic brain decline.
- Citicoline improves the overall clinical symptoms, including cognition, affective (mood) symptoms, and somatic symptoms such as fatigue and dizziness.
- Citicoline significantly increases the MMSE score in all the trials, indicating marked improvement of cognitive functions such as orientation and language in addition to memory and attention. The overall MMSE improvement ranged from 10-26 percent.
- In a direct comparison against advanced Alzheimer's disease, Citicoline performed roughly twice as well as acetylcaritnine.
- In mild to moderate Alzheimer's dementia benefit from citicoline (1200 mg per day) was similar to Donezepil and superior to Rivastigmine, citicoline patients improved not just on cognition but in behavior and activities of daily living, possibly improving patients and caregivers quality of life.
Citicoline protects neurons by repairing and stabilizing neuronal membrane which is damaged due to ischemia.

Citicoline significantly decreases time for normal recovery after cerebrovascular events and reduces damage to cognitive structures in patients with acute stroke.

Citicoline is a phospholipid cell membrane Builder, readily transforms to Phosphatidylcholine by simply adding back the fatty acid tails and thus citicoline has special value for our cells, in its native form it is a unique protagonist that can attain high levels in the cytoplasm without doing damage.

Conclusion:

The substantial body of human research establishes citicoline as a markedly beneficial orthomolecule (and nutraceutical) for individuals of all age groups. In many well-controlled clinical trials, citicoline improves mental performance in the healthy young, the middle-aged, and the elderly. In head-to-head comparisons citicoline benefits surpasses those of pharmaceuticals (oxiracetam, aniracetam, Idebenone) and nutraceuticals (acetyl carnitine, Citicoline). Its capacity to boost growth hormone release further elevates citicoline to a category all its own.

Citicoline is not a vitamin-human cells have the capacity to produce it. But the evidence suggests that under stress, the organs can be called upon to rapidly make new citicoline in large amounts, for its protective and other metabolic attributes. Under such biochemical-metabolic challenge, dietary citicoline availability makes a clinically measurable contribution to quality of life.

Citicoline fundamental importance to life is predicted from its universal occurrence down to the simplest life forms, and in particular for its relative abundance in mother’s milk. For Homo Sapiens sapiens, citicoline appears to be important from cradle to old age, citicoline diverse benefits as cell membrane fluidizer, choline and acetylcholine reservoir, osmoregulator, fertility support substance, and brain revatalizer, underscore its benefits for people of all ages.

From the available evidence, dietary citicoline supplementation benefits:

1. Development and maintenance of attention, concentration, recall
2. Speed and overall sharpness of mental processing
3. Mood, including positive attitude and sociability
4. Recovery of brain function following circulatory deprivation.
5. Revitalization of declining mental function.
6. For patients afflicted with stroke, cognitive problems that often follow surgery, or traumatic head injury. Citicoline offers safe and effective intervention that could make all the difference to quality of life if not to survival itself.

References:

"Double Primary Malignancies : A growing challenge for long term Cancer survivors"

L. Pattanayak¹, N. Panda²

Introduction:

The management of cancer is essentially a combined approach of surgery, radiation oncology and chemotherapy. As the treatment is getting better every day due to growing knowledge of cancer among oncologists, improved screening techniques and use of sophisticated investigation and diagnostic tools, we have witnessed a remarkably prolonged survival in cancer patients. Much alike a double edged sword this in turn has led to increased number of second malignancies among the long term cancer survivors. The present article is a review of literature to reinforce the increased interest among oncologists in this subject.

Review:-The concept of multiple primary malignancies is not very rare, with the global prevalence being 0.73 to 11.7 % (R 1). About 880,300 of the 11 million cancer survivors living in the U.S have been diagnosed with multiple primary malignancies which has also been the topic of special section in Cancer Facts and Figures 2009 (R 2).

Multiple primary malignancies are defined as appearance of a second de novo malignancy in a patient with a previous history of cancer. However the definition of MPM has been changing over time. The criteria necessary to make a diagnosis of multiple primary malignancies was first formulated in 1869 by Billroth (R 3) as:-

1. Each tumor must have an independent histopathological appearance.
2. The tumors must be separate and situated in different organs.
3. Each tumor must produce its own and separate metastases.

Most authors found the 3rd criteria rather stringent and it was later modified by Warren & Gates in 1932 (R 4) as follows:-
1. Each of the tumors must be malignancy confirmed by histology.
2. Each must be geographically separate and distinct. The lesions should be separated by normal mucosa.
3. Probability of one being the metastasis of the other must be excluded.

The above criteria were widely accepted but refined further by Mortel et al 1961, Cutis &Reis 2006 and Morris et al 2010. Across the Atlantic the IARC/IACR rules are used to define multiple primary cancers according to which:-
1. MPM are two or more tumors arising in different sites (defined by 1st 3 digits of the ICD for Oncology)
2. The different tumors may arise from the same site if the histopathology is different (according to Berg)
3. In case of paired organs like breast, only 1 tumor can be counted unless the histopathology differs.
4. BCC (basal cell carcinoma) and SCC (squamous cell carcinoma) of the skin are multiple primaries.

The most important factor of all of the above is excluding metastases and differentiating a second primary malignancy from a metastatic disease which requires a strong clinical decision and thorough evaluation.

MPM (Multiple primary malignancies) can be divided into two categories depending on the time interval between tumor diagnoses. (R 5) They may be:-
1. Synchronous cancers (if the time period between diagnosis of both the tumors is within 6 months)
2. Metachronous cancers (if the time period between diagnoses of both the tumors is more than 6 months).
If a patient has a cancer diagnosed at an early stage and a subsequent cancer is detected, it is more likely to be a second primary than a recurrence. When advanced cancers are diagnosed, however, it is unclear whether subsequent cancers in the patient are more likely to be a recurrence or a second primary. Therefore clinical acumen and judicious use of diagnostic tools is of paramount importance.

The most common occurrences are - ca ovary with ca colon, ca ovary with ca breast, ca breast with ca breast and others like cancers of skin, breast, acute leukemia, colorectal, lung and stomach cancer.

Mechanisms: Causal mechanisms of multiple primary cancers include genetic factors, environmental factors and treatment related factors:-

Genetic factors: Syndromes with DNA-MSI, Lynch I,II syndrome are associated with multiple primary malignancies. Mutation of p16, p53, PTEN, Rb gene is related to tumors of multiple tumors of breast, soft tissue, esophagus and other sites. (R 6) Data indicate that when a person is genetically predisposed to develop cancer, he or she will develop a second malignancy earlier than a person who develops sporadically.

Abnormal p53 gene, LOH, increased Ki-67 proliferation index is present in normal mucosa adjacent to the tumor and are thus considered to be implicated in the pathogenesis.

Environmental factors: Environmental agents include tobacco, alcohol, betel nut chewing, chemical pollutants and viruses.

In HNSCC, SPM illustrates the concept of field cancerization where environmental carcinogens induce field of mucosa (condemned mucosa) afflicted with premalignant disease described by Staughter et al in 1953. (R 7)

Head and neck squamous cell carcinomas (HNSCC) have 36 % cumulative lifetime risk of developing SPM over a period of 20 years, due to field cancerisation or the concept of condemned mucosa (R 8) Iin which environmental carcinogens, such as tobacco and alcohol, induce a field of mucosa afflicted with premalignant disease and elevate epithelial cancer risk throughout the upper aerodigestive tract.(R 9) According to Tepperman et al the risk of developing double primary malignancy in HNSCC is 2 – 6 % per year of F/U. (R 10)

Alcohol induces maximum SPM in oral cavity and oropharynx while Tobacco induces maximum number of laryngeal cancers. HPV strains are associated with oropharyngeal cancers and these SPM are associated with better survival compared with non HPV associated HNSCC. (R 11)

Therapeutic factors: Treatment of cancer is multimodality which includes surgery, chemotherapy and radiotherapy. Widespread use of chemotherapeutic agents and radiotherapy may be responsible for association between specific types of primary cancer.(R 12) The most common second primary malignancies which are treatment related are carcinoma of the breast, skin, acute leukemia, colorectal, lung and stomach. The documented risk of developing second primary is 10 % at 20 years, 26% at 30 years after completion of treatment of Hodgkin’s disease, 3.8% at 10 years and 7 % at 15 years after Doxorubicin based treatment for breast cancer.(R 13) The latent period for chemotheraphy or radiotherapy induced cancers is long , usually around 10-20years. (R 14)

Radiation induced cancers have been defined by Cahan et al. The Cahan Criteria for radiation induced malignancies, originally only for radiation induced sarcomas (modified by Sakai et al) include:-

1. A radiation induced malignancy must have arisen in an irradiated field.
2. A sufficient latent period, preferably longer than 4 yrs must have elapsed between the initial irradiation and the alleged induced malignancy.
3. The treated tumor and the induced tumor must be of different histologies.
4. The tissue in which the alleged induced tumor arose must have been metabolically and genetically normal prior to radiation exposure.

Conclusion :

Patients diagnosed and treated for cancer have a lifetime risk of developing another de novo malignancy depending upon genetic, environmental and iatrogenic risk factors. Improvised screening techniques and a well defined follow up strategy will guide oncologists for earlier detection and management of multiple primary malignancies. Each patient must also be
informed about the risks involved after cancer cure and the importance of reporting new symptoms.

References:

Acute Rheumatic Fever: Aetiology, Pathogenesis, Diagnosis And Management

T.K. Mishra¹, S.N. Routray², B. Das³, C. Satpathy³

Abstract:
Acute rheumatic fever and its sequelae rheumatic heart disease remain a major health problem worldwide. Although their incidence and prevalence have declined in the affluent nations, the poor in the less privileged countries continue to suffer from it. Poverty, overcrowding, lack of access to proper health care are major reasons for these. With growing prevalence of lifestyle diseases like DM, HTN, CAD in these countries, and with increasing focus of medical community on them, rheumatic heart disease management suffers from the lack of attention. In the absence of specific diagnostic test ARF is diagnosed by modified Jone's criteria. Primary and secondary prophylaxis are effective. Management of ARF needs supportive care and treatment of specific symptoms like arthritis, heart failure etc.

KEY WORDS: ACUTE RHEUMATIC FEVER, RHEUMATIC HEART DISEASE, STREPTOCOCCAL SORE THROAT, PENICILLIN PROPHYLAXIS

Introduction:
Rheumatic fever and rheumatic heart disease continue to be a major health problem in many parts of the world. Although developed countries have majorly got rid of the problem, it continues to be a major cause of cardiovascular morbidity and mortality in many of the developing countries including India. According to a recently published report, the global burden of Group A streptococcal disease is still high with a prevalence of at least 20 million cases with around 3,00,000 new cases each year and as many deaths. But with the growing burden of lifestyle diseases like DM, HTN, CAD, and as the focus of the medical community is shifting towards these, rheumatic fever and rheumatic heart disease management is suffering from lack of attention.

Epidemiology:
The prevalence of RHD has declined in developed nations. The decline in western countries has been attributable to improvement in standards of living with less overcrowding, early access to medical care, use of antibiotics and most importantly to change in virulence of organisms. But developing and third world countries continue to suffer from the menace of RHD. Lack of proper access to health care facilities on the one hand and poverty and ignorance on the other also compound the problem.

Acute rheumatic fever is a non-suppurative complication of Gr A streptococcal pharyngitis due to delayed immune response. Gr A streptococci are the most common bacterial cause of pharyngitis, with a peak incidence in children between 5-15 years of age. Streptococcal pharyngitis is less frequent among children in the first three years of life and among adults. The incidence of pharyngeal beta haemolytic streptococcal infection can vary between countries and within the same country, depending upon season, age group, socio-economic conditions, environmental factors and quality of healthcare. Surveys of healthy school children 6-10 years of age, for example, found anti streptolysin-O titres >200 Todd units in 15-70% of the children, while other studies reported beta haemolytic carrier rates of 10-50% for asymptomatic school children.

The presence of Gr A streptococci in the upper respiratory tract may reflect either true infection, or a carrier state. In either state the patient harbours the organism, but only in the case of a true infection does the patient show a rising antibody response. It is thought that a patient with a true infection is at risk of developing ARF and of spreading the organism to close contacts, and warrant antibiotic treatment, while this is not the case with the carriers.
A report of WHO concludes that approximately 18 million people currently suffer from a serious GAS disease, another 1.78 million new cases each year and these diseases are responsible for over 500,000 deaths each year. The vast majority of all these cases came from less developed countries (75% of RHD cases and 95% of ARF cases).

In 1994, it was estimated that 12 million individuals suffered from RF and RHD worldwide and at least 3 million had congestive heart failure that required repeat hospitalization.

Reliable data on incidence of ARF are scarce. The reported incidence of ARF varies widely across the globe. In the developed countries the incidence is < 1/100,000. It's the developing and third world countries which bear the major brunt of the disease. A few studies conducted in the developing countries report incidence rates ranging from 1/100,000 school age children in Costa Rica, 100/100,000 in Sudan to 150/100,000 in China. Crowding and socioeconomic status adversely affects the incidence of rheumatic fever.

Similar to ARF, the prevalence of RHD also varies widely across populations, ranging from 0.2/1000 school children in Havana, Cuba to 77.8 per thousand in Samoa. In India about six million children are suffering from RHD which is estimated to cause about 0.5 million deaths per year globally.

In India, the average age at presentation has been reported by Padmavati to be between 10 and 14 years. However, the early development (under 5 years) of established rheumatic heart disease and rapid progression to disabling cardiac involvement poses a major problem in India and has been termed as "Juvenile Mitral Stenosis". On occasions, it may occur in older age groups, as is seen in the epidemics occurring in closed populations like military recruits, crowded living conditions and those in contact with school children. The incidence of rheumatic fever (RF) varies from 0.2 to 0.75/1,000/year (mean 0.54) in school children 5 - 15 years of age. On an average, one-third of patients with a possible first attack of RF develop chronic valvular lesions. The prevalence rate of rheumatic heart disease in India is around 6-11/1000 in school children.

Aetiology :

Rheumatic fever results from an autoimmune response to infection with group A streptococcus, specifically after an episode of acute pharyngitis caused by the organism. During an epidemic of streptococcal sore throat as many as 3% develop ARF, if untreated. The incidence in endemic infection is much less with a reported incidence of 0.3%. Appropriate antibiotic treatment of streptococcal pharyngitis is effective in preventing ARF in most cases. But unfortunately at least one third of the ARF result from inapparent streptococcal infections. Prevention of initial episodes of ARF requires accurate recognition and proper antibiotic treatment of GAS pharyngitis.

GAS pharyngitis is primarily a disease of children 5-15 years of age. In temperate climates, it usually occurs in the winter and early spring. GAS is an uncommon cause of pharyngitis in preschool children, but outbreaks in childcare settings have been reported. However rheumatic fever is rare in children younger than 3 years of age. Initial attacks of ARF are rare in adults, although recurrences are well documented.

The Agent :

Group A streptococcus (GAS) causes a broad spectrum of diseases, from mild superficial infections of throat or skin, to infections such as cellulitis and erysipelas, severe invasive infections including bacteraemia and necrotizing fasciitis and the post streptococcal complications of ARF and AGN. Development of ARF is limited to few strains of Group A streptococci, causing sore throat and not others.

Recognition of existence of rheumatogenic strains among the streptococci dates back to early part of 20th century. During the World War-II, episodes ARF that occurred among military recruits, assembled, from many different areas of US, were shown to be caused by GAS strains belonging to but a few prominent M-serotypes. These epidemic strains were heavily encapsulated, M-protein rich variants.

As early as the late 1930s, Alvin Coburn noted that ARF was not reactivated by throat infections due to strains representing certain M-protein serotypes. By the 1950s, it was further reported that strains within certain M-types acute glomerulonephritis rather than ARF, the two complications very rarely occurring from the same antecedent infection.
Some characteristics of GAS strains clearly responsible for the great ARF epidemics of World War-II have been defined. Briefly, they are…

1. Very rich in M protein.
2. Heavily encapsulated.
3. Highly mouse virulent.
4. Produce striking mucoid colonies in blood agar plates.
5. Trophic primarily for throat rather than skin.
6. Evoke strong type specific immune responses in humans and in mice, much more so than M-type specific responses from pyoderma strains.
7. Do not contain the lipoproteinase commonly seen in skin strains i.e. serum opacity factor.
8. Distributed among a limited no of serotypes, such as M 1, 3, 5, 6, 18, 19 AND 24 and some others. It should be emphasized, however, that the M-serotype alone does not equate with rheumatogenicity because strain variation is common within a given serotype.

The Molecular Biology and Genetics of Well Known Rheumatogenic Gas.

By the 1980s, the primary molecular structure of M protein was determined and its type specific protein antigen was shown to reside in its small terminal N-acetyl peptide. Two highly conserved epitopes within M protein divide GAS immunologically into class I(Throat) and class II(Skin) strains. All ARF strains fall clearly into class I throat strains and individuals who had contracted ARF were shown to have higher than normal titres against the class I epitope, whereas they lacked antibodies to the class II epitope. Moreover, in the large M protein molecules of class I rheumatogenic strains, distinct epitopes were identified that cross react with cardiac, synovial and brain tissues and these were separable from the terminal type specific antigen.

The genes of M protein (emm) have now been shown to be divided into four sub families of nucleotide sequences, arranged in five distinctive chromosomal patterns, identified as A-E. By these genetic patterns, rheumatogenic pharyngitis strains are clearly differentiated from impetigo strains but not yet clearly from all other sore throat strains. Whether epitopes that cross react with host tissues are present exclusively in rheumatic fever strains is not clear. An attractive hypothesis is that the deposition of a heavy antigenic load of these cross reactive epitopes in pharyngeal lymphoid tissues, already hyper sensitized during early childhood by repeated streptococcal infections, causes a break in the immune tolerance of susceptible hosts that leads to the various stigmata of ARF.

Recently the M protein genes and those of the other components of the GAS viz. hyaluronic acid, streptolysin S, erythrogenic toxins and others have been identified. They provide a genomic approach to characterizing GAS strains. But other than providing quantitative features of virulence as measured by M protein and hyaluronate content, they do not provide any clues to differentiate between rheumatogenic and non-rheumatogenic strains, at present.

Pathogenesis:

ARF is a perfect example of an interaction between host, agent and environment. An interaction between a virulent pathogen, a susceptible host and in a conducive environment. Pathogenesis of acute rheumatic fever and RHD is a complex maze of events that are immunologically intricate, pathologically significant and clinically devastating for the patients. Despite years of intensive investigation, the exact pathogenesis of rheumatic fever and RHD remains unclear. However it is evident that abnormal humoral and cellular immune response occurs.

ARF is generally considered to be an inflammatory disorder of connective tissue. It is an autoimmune response to untreated or inadequately treated GAS pharyngitis in a genetically predisposed host. Due to an autoimmune reaction many parts of the body may be affected leading to multisystem disease. It has been proposed that triggering factor leading to autoimmunity in individuals is the antigen mimicry between streptococcal antigens, mainly M protein epitopes and human tissues, such as heart valves, myosin and tropomyosin, brain proteins, synovial tissue and cartilage. This is observed in individuals with a genetic predisposition. Though several genetic markers of susceptibility have been studied, no consistent association have been found. But in several populations, associations with different human leukocyte antigen (HLA) class II have been observed.
Molecular mimicry was first demonstrated by humoral immune response. Streptococcal antibodies cross react with several human tissues including the heart, skin, brain, glomerular basement membrane, striated and smooth muscles. There is a suggestion of the direct role of the CD4+ T-cells in the pathogenesis of RHD and these has been proved by the presence of these cells at the lesion sites in the heart. Infiltrating T lymphocytes from the heart lesions of severe RHD patients and peripheral T lymphocytes, were capable of recognizing immunodominant myocardium M5 peptides and valve proteins. These results have emphasized the significance of molecular mimicry between beta haemolytic streptococci and the heart tissue assessing the T cell repertoire leading to local tissue damage in RHD.

ARF occurs equally in boys and girls of age group of 6 to 15 years. In families prone to the disorder it is difficult to distinguish between hereditary factor and environmental factors such as overcrowding. Antibody titres to group A carbohydrate are significantly higher and more persistent in patients who develop RHD than in patients who do not. This may have a genetic basis. A large proportion of B-lymphocyte cells with a specific alloantigen have been found in 99% of patients with rheumatic fever as opposed to only 14% of cohorts. High incidences of class II HLA has been found in rheumatic fever patients.

Every cases of GAS infection does not develop ARF. Only 3 to 6% of population is susceptible for ARF. The ARF in monozygotic twins and many children in the same family indicate that susceptibility is inherited. Many patients with ARF have high level of mannose binding lectin and polymorphisms of TGF B1 gene and immunoglobulin gene in circulation. High levels of a particular alloantigen present on B-cells, D 8 to 17 has been found in patients with history of ARF. Intermediate level is found in first degree family members suggesting susceptibility is inherited.

Pathology :

ARF is a self-limited, multisystem disease that can affect the heart, joints, brain and cutaneous and the sub cutaneous tissues. It produces characteristic pathological changes in all these organs. The gross clinical manifestations of rheumatic arthritis are pain, tenderness and local heat diffusely distributed about the joint. An examination of the synovial fluid reveals many exudative cells, mostly polymorphonuclear leukocytes. Another remarkable feature of rheumatic arthritis is failure of the process to go on to suppuration apart from being fleeting and migratory. The joint capsule also shows focal necrosis, thrombosis of smaller arteries and endothelial and perivascular reactions similar to the changes found in heart and subcutaneous nodules. Cardiac involvement shows characteristic pathological changes. All the three layers of the heart are involved in ARF, hence the term “pancarditis”. Verrucous vegetations are found on the valve leaflets, along with extensive inflammation and oedema. In the exudative phase, during the first few weeks after the onset of RF, fibrinoid degeneration of collagen is noted. In the proliferative phase, 1 to 6 months after the onset of RF, Aschoff bodies, granulomatous lesions pathognomonic for rheumatic carditis appear. Although Aschoff bodies can be demonstrated as early as the second week of onset of RF, they may be present chronically without evidence of carditis. The subcutaneous nodules have histological picture similar to that seen in Aschoff body. Characteristic histologic findings include, fibrinoid necrosis at the center, surrounded by areas of cellular proliferation, Aschoff bodies and multinucleate giant cells. Capillaries are seen to be clogged either due to endothelial proliferation or by thrombosis. Grossly these nodules vary in size from 0.5 to 5 to 10 mm, although histologically larger nodules seem to be a conglomeration of submilliary nodules. Inflammatory changes have been noted in the cerebral cortex, cerebellum, and basal ganglia in patients with chorea.

Clinical Manifestations

The signs and symptoms of ARF vary greatly and are determined by the systems involved, the severity of the lesions, their time of appearance in the course of disease and the stage of the disease at the time the patient is first observed by the physician. To promote uniformity in diagnosis, Jones proposed a set of criteria based on which he termed, the major and minor clinical and laboratory manifestations of rheumatic fever. The criteria are designed to establish the diagnosis in patients of acute rheumatic fever. The word major and minor is related to their importance as a diagnostic criteria and does not refer to the severity of the process, its
activity or to prognosis. They should not be used for measuring rheumatic activity nor of establishing the diagnosis of inactive rheumatic heart disease.

The original Jones criteria were revised in 1992 by the AHA’s committee on rheumatic fever and bacterial endocarditis (Table 1). In the absence of a specific diagnostic test for rheumatic fever, the revised criteria serve as a guide for diagnosis of ARF. In 2002-2003 WHO also proposed criteria for diagnosis of rheumatic fever and rheumatic heart disease, which is also based on revised Jones criteria (Table 2).

**Table 1: Modified Jones Criteria for Diagnosis of Inital Attack of Rheumatic Fever**

<table>
<thead>
<tr>
<th>Major criteria</th>
<th>Minor criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carditis</td>
<td>Fever</td>
</tr>
<tr>
<td>Polyarthritis, migratory</td>
<td>Arthralgia</td>
</tr>
<tr>
<td>Erythema marginatum</td>
<td>Elevated acute phase reactants (ESR, CRP)</td>
</tr>
<tr>
<td>Chorea</td>
<td>Prolonged PR interval in ECG</td>
</tr>
<tr>
<td>Subcutaneous nodules</td>
<td></td>
</tr>
<tr>
<td>Plus: Evidence of preceding group-A streptococcal infection (culture, rapid antigen, and antibody rise/elevation)</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: 2002-2003 WHO criteria for the diagnosis of rheumatic fever and rheumatic heart disease (based on the revised Jones criteria)**

<table>
<thead>
<tr>
<th>Diagnostic categories</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary episode of RF *</td>
<td>Two major * or one major and two minor ** manifestations plus evidence of a preceding group A streptococcal infection ***</td>
</tr>
<tr>
<td>Recurrent attack of RF in a patient without established rheumatic heart disease.</td>
<td>Two major * or one major and two minor manifestations plus evidence of a preceding group A streptococcal infection.</td>
</tr>
<tr>
<td>Recurrent attack of RF in a patient with a preceding group A streptococcal infection.</td>
<td>Two minor manifestations plus evidence of established rheumatic heart disease.</td>
</tr>
<tr>
<td>Rheumatic chorea. Insidious onset rheumatic carditis.</td>
<td>Other major manifestations or evidence of group A streptococcal infection not required.</td>
</tr>
<tr>
<td>Chronic valve lesions of RHD (patients presenting for the first time with pure mitral stenosis or mixed mitral valve disease and/or aortic valve disease).</td>
<td>Do not require any other criteria to be diagnosed as having rheumatic heart disease.</td>
</tr>
</tbody>
</table>

**Major Manifestations**


**Arthritis**

Arthritis is the most frequent and early major manifestation of RF, occurring in up to 75% of patients during the first attack. Joint involvement may vary from arthralgia to disabling arthritis. It typically presents as migratory polyarthritis, most often in the larger joints. Inflamed joints are characteristically warm, red and swollen, and an aspirated sample of synovial fluid may reveal a high average leukocyte count (29,000/mm3, range 2,000 - 96,000/mm3).

**Differential diagnosis of arthritis in RF**

Polyarthritis unaccompanied by other major manifestations of RF deserves differential diagnosis from septic arthritis which may be ruled out by microbiological studies. Gonococcal arthritis can be excluded by an epidemiological history and characteristic skin lesions (if present), in addition to gonococcal cultures of urethra, cervix, rectum and pharynx. Arthritis may also occur in infective endocarditis, and it may be difficult to differentiate this disease from RF, particularly when the endocarditis occurs in a patient with known RHD. The epidemiological features, history, physical examination, results of blood cultures, echocardiographic studies, and antistreptococcal antibody assays may all help to differentiate between infective endocarditis and RF. Lyme disease, which presents with arthritis, cardiac involvement, and skin lesions, may at times suggest RF; even the skin lesions of erythema chronicum migrans may resemble erythema marginatum. The diagnosis can be confirmed by serological studies and the response to antimicrobial therapy. Viraemias, including hepatitis B and C, rubella, serum sickness and finally, collagen vascular diseases, such as rheumatoid arthritis and systemic lupus erythematosus (SLE) may, at their onset, mimic RF. In juvenile rheumatoid arthritis certain associated findings, such as rash, lymphadenopathy and splenomegaly, may suggest the diagnosis. Henoch-Schönlein purpura, sickle-cell anaemia, acute leukaemia and gout at times mimic the arthritis of RF. The arthritis of RF heals completely, unlike carditis, and leaves no pathological
or functional residua. The one possible exception is Jaccoud's chronic postrheumatic arthritis. This rare condition is not a true synovitis, but rather is a periarticular fibrosis of the metacarpophalangeal joints. It usually occurs in patients with severe RHD, but is not associated with evidence of RF.

**Sydenham's chorea**

Chorea occurs primarily in children and is rare after the age of 20 years. It occurs primarily in females, and almost never occurs in post-pubertal males. The prevalence of chorea in RF patients varied from 5 - 36% in different reports. Sydenham's chorea is characterised by emotional lability, uncoordinated movements, and muscular weakness14, 15. Neither sensory deficits nor pyramidal tract involvement are present. Chorea has a latent period of 1 - 7 months. As a result, polyarthritis and Sydenham's chorea do not occur together; and the onset of chorea often calls attention to subclinical carditis. Streptococcal antibody titres and laboratory measures of inflammation may have resolved by the time choreiform movements appear.

**Subcutaneous nodules**

The incidence of subcutaneous nodules in acute RF has been reported in up to 20% of cases16. The subcutaneous nodules are round, firm, freely moveable, painless lesions varying in size from 0.5 - 2.0 cm. They occur in crops over bony prominences or extensor tendons. Common locations are the elbows, wrists, knees, ankles and Achilles tendons, occiput, and spinous process of the vertebrae. In most cases, they are associated with the presence of severe carditis.

**Erythema marginatum**

Erythema marginatum occurs in up to 15% of RF patients. The lesions of erythema marginatum appear first as a bright pink macule or papule that spreads outward in a circular or serpiginous pattern. They are better identified in fair complexioned individuals and are transient in nature. The lesions are multiple, nonpruritic and painless, occur early in the disease, may persist or recur and are associated with carditis.

**Minor manifestations**

Arthralgia and fever are termed "minor" manifestations because they lack diagnostic specificity. Fever occurs in almost all rheumatic attacks at the onset, usually ranging from 101° F to 104° F (38.4 - 40.0° C). Arthralgia without objective findings is common in RF. The pain usually involves large joints, may be mild or incapacitating, and may be present for days to weeks, often varying in severity. Elevated acute phase reactants like CRP, raised ESR and increased leucocyte count along with prolong PR interval are the other minor manifestations.

Two major or one major and two minor criteria plus evidence of preceding streptococcal infection indicate a high probability of rheumatic fever. In the three special categories listed below, the diagnosis of rheumatic fever is acceptable without two major or one major and two minor criteria. However, only for a and b can the requirement for evidence of a preceding streptococcal infection be ignored.

a. Chorea, if other causes have been excluded
b. Insidious or late-onset carditis with no other explanation
c. Rheumatic recurrence: in patients with documented rheumatic heart disease or, prior rheumatic fever, the presence of one major criterion, or of fever, arthralgia or elevated acute phase reactants suggests a presumptive diagnosis of recurrence. Evidence of previous streptococcal infection is needed.

**Laboratory Findings**

The two laboratory minor criteria are elevation of acute phase reactants and prolongation of PR interval in ECG. These are nonspecific findings. When patient has only one major manifestation, these minor criteria may be useful. ESR and CRP are the most commonly used acute phase reactants. ESR is dramatically high in ARF, but it decreases in CCF but seldom below normal. ESR value is also biased by concomitant anaemia. But CRP value is unaffected by CCF and anaemia. CRP may appear to rise before ESR goes up and falls earlier than ESR. Both these acute phase reactants may be normal when chorea is present as an isolated manifestation.

Prolongation of PR interval is the most common ECG manifestation in ARF patients. AV conduction delay is unrelated to carditis and has no prognostic value in terms of cardiac sequelae. It is present in
35% of patients with ARF and 60% of patients who show ECG abnormalities.

**Diagnosis of streptococcal infection**

The gold standard for detecting the causative organism remains a throat swab on blood agar culture. Cultures negative for S. pyogenes after an overnight incubation should be incubated for another 24 hours. Only 11% patients have positive throat cultures for group A streptococcus.

Several rapid GAS antigen detection tests are available. Most of these tests have a high degree of specificity but a low sensitivity in a clinical setting. A negative test does not rule out the presence of group A streptococcal infection in the throat. A positive throat culture or rapid antigen test does not distinguish between a recent infection that can be associated with acute RF and chronic carrier of organism in throat.

**Laboratory tests that support a diagnosis of RF**

The diagnosis of RF requires evidence of prior streptococcal infections. The most commonly performed and commercially available tests are antistreptolysin-O test, and the antideoxyribonuclease B test. The blood titres of antistreptolysin-O, antideoxyribonuclease B reach a peak 3 - 4 weeks after the acute infection, and usually are maintained for 2 - 3 months before declining. The mean periods of time to normalisation for these serological tests were 4 months for ASO and 35 months for ADNase-B. Other antibody tests which are occasionally done are anti hyaluronidase H (AH) and antistreptozyme (ASTZ). It must be stressed that elevated ASO titre (>250 Todd units (adults) and >333 Todd units (Children) are considered to be significant for diagnosis. ASO level may rise and fall irrespective of the course of rheumatic fever.

**New diagnostic techniques for rheumatic carditis**

**Echocardiography**

There are significant advantages in using echocardiography to detect valvulitis. The use of 2D echo-Doppler and colour flow Doppler echocardiography may prevent the over diagnosis of a functional murmur as valvular heart disease. Similarly, the over interpretation of physiological or trivial valvular regurgitation may result in a misdiagnosis of iatrogenic valvular disease. Although several researchers have recommended the use of echocardiography as a major criterion at present the role of echocardiography in the diagnosis of rheumatic carditis remains supportive.

**Endomyocardial biopsy**

Current data suggest that endomyocardial biopsy may not provide additional diagnostic information for patients with clinical carditis during a primary episode of RF.

**Radionuclide imaging**

As rheumatic carditis is predominantly infiltrative, rather than degenerative in nature, radionuclide imaging is not a tool which can be used in usual clinical settings and may be reserved for research purposes.

**Medical management of rheumatic fever**

**General measures**

All patients with acute RF should be placed on bed rest and monitored closely for the onset of carditis. In patients with carditis, a rest period of at least four weeks is recommended. Patients with chorea must be placed in a protective environment so they do not injure themselves.

**Antimicrobial therapy**

Ideally, two throat cultures should be performed before starting antibiotics. However, antibiotic therapy is warranted even if the throat cultures are negative. Penicillin is the drug of choice and can be given orally (as penicillin, 500 mg PO twice daily for 10 days) or as a single dose of 1.2 million units IM benzathine penicillin G. Erythromycin, 250 mg qid for 7 to 10 days, may be used for patients with penicillin allergy. Antibiotic therapy does not alter the course, frequency and severity of cardiac involvement.

**Suppression of the inflammatory process**

Aspirin, 100 mg/kg/day divided into 4 - 5 doses, is the first line of therapy and is generally adequate for achieving a clinical response. In children, the dose may be increased to 125 mg/kg/day, and to 6 - 8 g/day in adults. In a recent meta-analysis of the use of salicylates or steroids, no differences were observed in the long term outcomes of these treatments for decreasing the frequency of late rheumatic valvular disease. However, since one large study in the meta-analysis favoured the use of steroids, it remains unclear whether one treatment is superior to the other. Patients with pericarditis or heart failure respond favourably to
corticosteroids; corticosteroids are also advisable in patients who do not respond to salicylates and who continue to worsen and develop heart failure despite anti-inflammatory therapy. The use of steroids is not indicated solely for the treatment of arthritis in RF. Therapy may be initiated with prednisone (1 - 2 mg/kg/day, to a maximum of 80 mg/day) or intravenous methyl prednisolone given once daily. Since there is no evidence that aspirin or corticosteroid therapy affects the course of carditis or reduces the incidence of subsequent heart disease, the duration of anti-inflammatory therapy is based upon the clinical response to therapy and normalisation of acute phase reactants. Salicylates may be given for 4 - 6 weeks and gradually tapered so as to prevent a rebound.

**Management of heart failure**

Heart failure in RF generally responds to bed rest and steroids, but in patients with severe symptoms, diuretics, angiotensin converting enzyme inhibitors, and digoxin may be used.

**Management of chorea**

Chorea has traditionally been considered to be a self-limiting benign disease, requiring no therapy. However, there are recent reports that a protracted course can lead to disability and/or social isolation. The signs and symptoms of chorea generally do not respond well to anti-inflammatory agents. Neuroleptics, benzodiazepines and anti-epileptics are indicated, in combination with supportive measures such as rest in a quiet room. Haloperidol and valproate have been reported to be effective in the treatment of chorea. There is no convincing evidence that steroids are beneficial for the therapy of the chorea associated with rheumatic fever.

**Prevention (TABLE3 & 4)**

**Primary prevention**

As elimination of the major risk factors for streptococcal infection is difficult to achieve, the mainstay of primary prevention for ARF remains primary prophylaxis, i.e., the timely and complete treatment of group A streptococcal sore throat with antibiotics. If commenced within 9 days of sore throat onset, a course of 10 days of penicillin V (500 mg bid PO in adults) or a single IM injection of 1.2 million units of benzathine penicillin G will prevent almost all cases of ARF that would otherwise have developed.

In patients sensitive to penicillin, erythromycin 250 mg qid may be given for 7 to 10 days.

**Table 3: Primary and Secondary Prophylaxis for Acute Rheumatic Fever**

<table>
<thead>
<tr>
<th>Primary prophylaxis</th>
<th>Intradamacular</th>
<th>Oral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzathine penicillin G</td>
<td>12,00,000 U (600,000 U, if weight less than 27 kgs) single dose.</td>
<td>500mg bid daily for 10 days</td>
</tr>
<tr>
<td>Penicillin V</td>
<td>Erythromycin</td>
<td>Others (Clindamycin, amoxicillin, ampicillin, amoxycillin, cephalaxin)</td>
</tr>
<tr>
<td>250mg qid daily for 10 days</td>
<td>Dose varies</td>
<td></td>
</tr>
</tbody>
</table>

**Secondary prophylaxis**

<table>
<thead>
<tr>
<th>Secondary prophylaxis</th>
<th>Intradamacular</th>
<th>Oral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzathine penicillin G</td>
<td>12,00,000 U every 3-4 weeks</td>
<td>Penicillin V</td>
</tr>
<tr>
<td>250mg bid daily</td>
<td>Sulfadiazine</td>
<td>1 gm od (0.5 gm od in children)</td>
</tr>
<tr>
<td>Erythromycin stearate</td>
<td>250mg bid daily</td>
<td></td>
</tr>
</tbody>
</table>

**Table 4: Duration of Secondary Prophylaxis**

<table>
<thead>
<tr>
<th>Category of Patient</th>
<th>Duration of Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without proven carditis</td>
<td>5 years after the last attack/18 yrs of age (Whichever is longer)</td>
</tr>
<tr>
<td>With Carditis</td>
<td>10 years after the last attack or 25 yrs of age (Whichever is longer)</td>
</tr>
<tr>
<td>Major Valvular disease</td>
<td>Lifelong</td>
</tr>
<tr>
<td>Valve surgery</td>
<td>Lifelong</td>
</tr>
</tbody>
</table>

**Secondary prevention**

The mainstay of controlling ARF and RHD is secondary prevention. The best antibiotic for secondary prophylaxis is benzathine penicillin G (1.2 million units, or 600,000 units if < 30 kg) delivered every 3 weeks to persons considered to be at particularly high risk. Oral penicillin V (250 mg) can be given twice-daily instead but is somewhat less effective than benzathine penicillin G. Penicillin allergic patients can receive erythromycin (250 mg) twice daily. The recommended duration of secondary prophylaxis is shown in Table 3.

**Streptococcus vaccine**

Several potential group A streptococcus vaccines are in the development process, including a multi-valent, M serotype specific construct, an effective vaccine is unlikely to be available in recent future.

**CONCLUSION**

Acute rheumatic fever and its chronic sequelae RHD are laeding cause of cardiac morbidity and mortality world over especially developing countries like India. Poor SES, overcrowding, lack of proper access to healthcare and consequently lack of proper
preventive and diagnostic measures are measure reasons. Growing prevalence of lifestyle diseases continue draw the focus away from rheumatic heart disease management, in these countries. Although preventive measures are cost effective, they suffer from lack of implementation. Early recognition of streptococcal sore throat and its treatment, timely intervention and management of ARF require simple but dedicated efforts but are nonetheless effective in preventing future development of RHD to a major extent.

References:
5. Padmavati S. Present Status of Rheumatic Fever and Rheumatic Heart Disease in India. Indian Heart J. 1995, 47:395-398
6. Padmavati S. Rheumatic fever and Rheumatic heart disease in India at the turn of the country. Indian Heart Journal 2 001;53:35-37.

a. Patients may present with polyarthritis (or with only polyarthralgia or monoarthritis) and with several(3 or more) other minor manifestations, together with evidence of recent group A streptococcal infection. Some of these cases may later turn out to be rheumatic fever. It is prudent to consider them as cases of "probable rheumatic fever" (once other diagnoses are excluded) and advise regular secondary prophylaxis. Such patients require close follow up and regular examination of the heart. This cautious approach is particularly suitable for patients in vulnerable age groups in high incidence settings.

b. Infective endocarditis should be excluded.

c. Some patients with recurrent attacks may not fulfill these criteria.

d. Congenital heart disease should be excluded.
Articulation Synoviales
– An Anatomical Overview
M. Panda¹, C.L. Sarangi², R. Biswal², S.Seth³

Introduction

When two or more bones come closer together, articulate and are supported by a variety of soft tissue structures with a prime function being transmission of forces and enabling movement, it is called a joint. The whole of the skeletal framework is built up on articulations in which the participating bones and cartilages in a particular joint are either immovably united together or spaces are there in between the members of the joint to allow movement between themselves. All such unions are grouped as arthroses, joints, articulations, juncturae or junctions. Arthroses are concerned with differential growth, transmission of forces (tensile, compressive, shear and torsion) and movement (from consolidation and complete rigidity at one extreme, to relatively free but controlled movement at the other).

Classification of Arthroses

(1) Synarthroses
   (a) Fibrous joints (Solid joints)
   (b) Cartilaginous joints

(2) Diarthroses
   (a) Synovial joints (cavitated)

Cavitated (synovial) joints formally called as diarthroses are formed between the ends of endochondral bones. Each articular surface is covered by specialized hyaline cartilage which is strongly adherent to the bone on one aspect and a free, lubricated, macroscopically smooth, wear resistant surface on the other, which can glide over its fellow with minimal friction. The space between the apposed surfaces contains lubricating and nutritive synovial fluid that is secreted by the synovial membrane which lines the surrounding fibrous capsule and other nonarticular joint surfaces. With these unique characteristic features the more mobile synovial articulations operate in a different manner from the nonsynovial fibrous and cartilaginous joints.

Evolution of Synovial Joints

If we look down the evolutionary scale, synovial articulation occurs as far as in the joints of jaws of the lung fish (Dipnoi). However most of the movable bony junctions in the piscine ancestors were in the simplest form, and the next step in the evolutionary process was the appearance of multiple fluid filled cavities in the deformable tissue. Gradually further advances were observed in union of these cavities into a single joint cavity which was surrounded by a substantial cuff of tissue that united the involved skeletal components. Then with subsequent development of a synovial membrane along with the synovial fluid, reduced to a mere film, facilitated the sliding mechanism and thus increased the frequency of movement along with refinement. Therefore evolution of synovial joints in the
mammals shows two tendencies. Firstly the number increases by replacement of nonsynovial joints reaching their smallest terminal articulations in the limbs. Secondly there is increased specialization of the synovial joints which is very much required for its dynamicity during movements.

**Development of Synovial Joints**

**General classification of synovial joints**

1. **According to shape and form of the articulating surfaces**
   - Plane joints — Ex.-Intermetatarsal and some intercarpal
   - Gynglimus (hinge joints)—Ex.— Humeroulnar and interphalangeal
   - Trochoid (pivot joints)—Ex.—Superior radioulnar and atlantoaxial
   - Spheroidal (Ball and socket joints)—Ex. Shoulder and hip
   - Condylar joints —Ex.-Knee and Temporomandibular
   - Ellipsoid (Condyloid) joints — Ex. Radiocarpal and Metacarpophalangeal
   - Saddlle (Sellar) joints — Ex. Carpometacarpal joint of thumb and calcaneocuboid

2. **According to degrees of freedom of joints**
   - Uniaxial — One degree of freedom Ex. Hinge joints
   - Biaxial — Two degrees of freedom Ex. Ellipsoid joints
   - Multiaxial — Three degrees of freedom Ex. Shoulder joint.

3. **According to involvement of number of articulating surfaces**
   - Simple joint — Two surfaces – male(convex surface) and female (concave surface).
   - Compound joints — More than two articulating surfacesEx. Elbow joint.
   - Complex synovial joints — Intraarticular disc or a meniscus is interposed between the articulating surfaces. Ex. Temporomandibular joint

**Structure of Synovial Joints**

**Articular Surfaces**

Articular surfaces are mostly formed by a special variety of hyaline cartilage which reflects its preformation from parts of cartilaginous models in embryonic life except in case of the sternoclavicular, acromioclavicular and temporoan mandibular joints which are formed by intramembranous ossification. Articular cartilage has certain special qualities for the ‘closed-packed position’ of the joint like, that it has a wear resistant, low frictional, lubricated, slightly compressible and elastic surface to absorb large forces of compression and shear generated by gravity and muscle power.

Young cartilages are typically white, smooth, glistening and compressible but as the age advances it becomes thinner, less cellular, firmer, more brittle with a less regular surface and a yellowish opacity. This is because of the fact that the cartilage cells are in the form of several layers, out of which the surface ones are flattened indicating signs of degeneration while those overlying the bone are of proliferative type with signs of calcification. Due to more of degeneration in elderly persons the cartilages are thinner, ranging from 1-2 mm in thickness in the small joints of the hand while the larger joints of younger individuals have a thickness of around 5-7 mm.

The cartilages are also porous like a sponge with a pore size of 6nm. These pores along with crests and troughs trap pools of synovial fluid and with increase in load and compression there is weeping of fluid from the porous surface thus increasing the lubricity of the surfaces for smooth gliding. But with advancing age undulations of the articular surfaces deepen and develop minute ragged projections due to wear and tear and also because of the fact that replacement is not possible due to absence of mitosis in the adult articular cartilage. Erosion occurs in pathologically dry joints and where synovial viscosity is altered, but in healthy joints the changes are very slow. Articular cartilage is avascular and not supplied by nerves except for occasional vascular loops reaching and even penetrating the calcified zone from the osseous side. So nutrition solely depends on a peripheral vascular plexus in synovial membrane (circulus vasculosus articuli) by which the peripheral portions are protected but the central portions derive their nutrition from the synovial fluid.
Synovial Membrane

Upto the 4th month of intrauterine life a diarthrodial joint cavity is completely lined by a stratum of mesenchymal tissue which not only covers the inner aspects of the capsular ligament but also covers the articular cartilages. By the 5th month when active intrauterine movement begins, the synovial membrane differentiates from this layer of the mesenchyme and that lining the articular cartilages becomes rubbed off due to pressure and friction. At birth the synovial membrane still encroaches to a slight extent but it soon disappears with greater range of movement.

Distribution: The synovial membrane lines the interior of the capsular ligament, the bone between the ligament and the articular cartilage. It also invests the intracapsular ligaments and tendons. Sometimes a bag of the membrane comes out through some opening in the capsular ligament and acts as a bursa for the neighbouring muscle. It is absent from intraarticular discs or menisci and ceases at the margins of the articular cartilages.

Few small synovial villi are seen on the pink smooth internal synovial surface which increase in size and number as age advances. Flexible and elastic articular fat pads also occur in the synovial membrane which are helpful in filling up the changing spaces during movement of a joint. They increase the synovial area and also help in distribution of the lubricant over articular surfaces.

Structure: The synovial membrane has a synovial intima consisting of pleomorphic synoviocytes (Type A and Type B) embedded in a granular, amorphous fibre free intercellular matrix and a fibrovascular subintimal lamina which is often loose and areolar but sometimes containing organized lamellae of collagen and elastic fibres. In between these two layers there are fibroblasts, macrophages, mast cells and fat cells.

Function: Macrophage like Type A synoviocytes originating from the bone marrow, with certain immunohistochemical properties, help in removal of debris from the joint cavity. Type B cells of local origin from within the intima resemble fibroblasts and they increase in number in response to acute trauma and acute haemarthrosis. Both of the types of synoviocytes synthesize hyaluronic acid and are also involved in the secretion of lubricin which acts as an articular cartilage lubricant. They also secrete collagen, proteoglycans and fibronectin. Some synoviocytes present antigens to lymphocytes and thus rapidly stimulate an immune response to foreign materials appearing in the joint cavity.

Synovial Fluid

Synovial fluid which is a dialysate of blood plasma occupies synovial joints, bursae and tendon sheaths. It is clear or pale yellow in colour, viscous, slightly alkaline at rest with the alkalinity decreasing in activity and has a small population of cells along with metachromatic amorphous particles. With low rates of shear, the fluid is highly viscous but viscosity decreases as the rate of shear increases indicating that in slow movement weight bearing capacity is maximal. However, viscosity falls with increasing temperature and pH. But elasticity increases with higher rates of shear.

The main components of synovial fluid are protein (0.9 mg/100 ml) derived from blood, mucin and hyaluronate, a sulphate-free glycosaminoglycan containing equimolar concentrations of glucuronic acid and N-acetylglucosamine. While Phosphatidylcholine, another component of synovial fluid has been proposed as a boundary lubricant for articular cartilage which also acts as a protectant to the joint surface. Functions: The synovial fluid provides a liquid environment for the joint surfaces, nutrition of articular cartilages, discs and menisci and lubrication along with reduction of erosion.

Diag: Structures of a synovial joint
References:

7. Umich 2010 course, Module - Introduction to Joints
Symphysis Pubis Diastasis After Normal Vaginal Birth: A Case Report
S.K. Samal¹, S. Rathod¹, S. Jagadeb², S. Kanungo³

Abstract:

The reported incidence of peripartum pubic separation varies from 1 in 300 to 1 in 30,000 deliveries, although it may occur during the antepartum, intrapartum and postpartum periods. Mild separation of the symphysis pubis during pregnancy is considered physiological. We report a case of a 26-year-old primigravida who delivered a 3.2 kg, male child after a normal vaginal delivery. On the 3rd postpartum day, she developed severe pain in the suprapubic region and was unable to stand, walk or sit properly because of the pain. On local examination acute tenderness was present in the region of the pubic symphysis. A clinical diagnosis of pubic bone diastasis was done. Pelvic x-ray showed disruption of pubic symphysis by 2.5 cm. Pelvic strapping with adhesive tape were done. The patient was put on analgesics and anti-inflammatory drugs. She was discharged on the 6th postpartum day and advised complete bed rest. Follow up after 3 weeks showed decrease in pain at the suprapubic region and X-ray showed a gap of 1.7 cm. She was able to walk with support. At the next follow up after one month she could walk comfortably without pain. She could do her routine household work.

Key Words:
Symphysis Pubis Diastasis, Normal vaginal delivery, Relaxin, Adhesive pelvic strapping.

Introduction:

The reported incidence of peripartum pubic separation varies from 1 in 300 to 1 in 30,000 deliveries, although it may occur during the antepartum, intrapartum and postpartum periods. Mild separation of the symphysis pubis during pregnancy is considered physiological. Separations of more than 10 mm³ are usually associated with tenderness and difficulty with walking, and are thought to be pathological. Factors contributing to rupture of the symphysis pubis during vaginal delivery are poorly defined. The injury is thought to be caused by the fetal head exerting pressure on the pelvic ligaments, which have been weakened or relaxed by the hormones progesterone and relaxin. It is thought to occur more commonly if manual pressure is applied to the pelvis in a latero-lateral and antero-posterior direction. The McRoberts manoeuvre, may result in pubic symphysis diastasis, especially when excessive force is used or when there is prolonged placement of the patient’s legs in a hyperflexed position.

Case Report:

We present a case of spontaneous symphysis pubis diastasis in a healthy primigravida, after a straightforward, uncomplicated, non-operative, term vaginal delivery. A 26-year-old primigravida admitted in labor & delivered a 3.2 kg, male child after a normal vaginal delivery. On the 3rd postpartum day, she developed severe pain in the suprapubic region and was unable to stand, walk or sit properly because of the pain. General examination revealed nothing abnormal. On local examination acute tenderness was present in the region of the pubic symphysis. She had no evidence of sepsis or urinary retention. A clinical
diagnosis of pubic bone diastasis was considered because of severe tenderness at pubic symphysis. Pelvic x-ray showed disruption of pubic symphysis by 2.5 cm (Figure 1). The diagnosis was confirmed by Orthopaedic surgeon. Adhesive tape strapping and pelvic strapping with canvas belt were done. Foley’s catheter was inserted. The patient was put on analgesics and anti-inflammatory drugs. She was discharged on the 7th postpartum day and advised complete bed rest, pelvic strapping and analgesics. Follow up after 3 weeks showed decrease in pain at the suprapubic region and X-ray showed a gap of 1.7 cm(Figure 2). She was able to walk with support. Her catheter was removed. At the next follow up after one month she could walk comfortably without pain. She could do her routine household work.

She had no plans to embark on another pregnancy. She was counselled regarding the possibility of a recurrence in her next pregnancy.

Discussion:

This case illustrates the rare occurrence of pubic symphysis diastasis in a healthy primigravida following an uncomplicated term vaginal delivery. Peripartum pubic symphysisal rupture was diagnosed on clinical grounds and the diagnosis was confirmed by radiography with an anteroposterior X-ray of the pelvis, which showed diastasis of the pubic rami. The use of magnetic resonance imaging (MRI) has been described to enable the visualisation of the soft tissue injury.\(^6\) The pain of symphysis pubis diastasis during and after pregnancy can be disabling. Most patients present with severe pain located in the areas supplied by the pudendal and genitofemoral nerves. The pain may radiate to the sacroiliac joints and shoot down the buttocks and legs. Pubic symphysis diastasis following childbirth and vaginal birth differs from other traumatic symphysisal diastases with respect to both natural history and treatment.\(^7\) During pregnancy, the ligamentous laxity allows for greater elongation of the ligaments before they are rendered incompetent. After delivery, the pelvic ligaments rapidly tighten so that the pelvis is stabilised sooner compared to injuries that have a similar radiographic appearance but are the result of traumatic pelvic injuries. Pubic symphysis diastases following vaginal delivery are rarely associated with soft tissue and visceral injuries compared to traumatic symphysisal rupture. Cases of bladder incarceration\(^8\) and bowel herniation\(^9\) have been reported in traumatic symphysis pubis diastasis. However, vestibular rupture and complete disruption of the external anal sphincter have been reported in only 1 case of symphysisal diastasis during spontaneous vaginal delivery.\(^10\) The vigorous application of the McRoberts position or suprapubic pressure may increase the risk of pubic symphysis diastasis, and in some cases may also result in injury to the urinary bladder. Most cases of non-traumatic symphysis pubis diastasis following vaginal birth can be successfully managed conservatively with bed rest, analgesia and activity restriction.\(^7,11\) Techniques for managing traumatic diastasis of the pubic symphysis include bed rest, hip spica casting, pelvic slings, external fixation and internal fixation. Based on a literature review, there is a significant risk of repeat symphysisal rupture with subsequent vaginal delivery. However, a case of successful and uneventful vaginal delivery following a rupture has been reported.\(^11\)

Conclusion:

Pubic symphysis diastasis is an uncommon injury that should be considered when evaluating patients in the peripartum period who are experiencing suprapubic, sacroiliac or thigh pain. This case report demonstrated that severe non-traumatic symphysisal rupture associated with vaginal delivery can be managed satisfactorily, without any operative intervention or prolonged bed rest.
A rare case of Conjoined Twins
(Parapagus dicephalus tetra-brachius tripus)

T.S. Rath¹, K. Priyambada², S. Jena²

Introduction:
Conjoined twin is a quite rare congenital anomaly which can be seen in 1/50,000 -1/100,000 pregnancies. Considering that 60% of these fetuses die in a short time after delivery or born dead, real incidence of live birth is calculated as 1/200,000 (1). Though the exact etiology of conjoined twins is not known, two theories are suggested: According to the first theory, monovular embryo is divided incompletely at 13th-15th days of conception. In fusion theory, a secondary fusion occurs between two monovular embryonic discs. It has been argued in the literature that fusion theory can explain all conjoined twin cases; by spherical theory, it has been explained that conjoined twins are attached to each other asymmetrically or through different body parts (2,3). Classification of conjoined twins was widely accepted as suggested by Spencer; according to him, ventral or dorsal fusion of embryonic disc may occur (2). Body part numbers are expressed as di- (two), tri- (three), tetra- (four) and body parts expressed by Latin words [for instance, brachius (arm), -pus (lower extremity), prospus (face) etc.]. When different fusions are compared, conjoined twins with central fusion are seen more frequently since somite development begins from the centre and proceeds towards caudal and cranial parts (4). Conjoined twins with ventral fusion cover 87% of all cases; 11% of them are cephalopagus cases, 19% of them are thoracopagus cases, 18% of them are omphalopagus cases, 11% of them are ischiopagus cases and 28% of them are parapagus cases(5).

Case Report:
Mrs. RB, from Jajpur, a 30 year old G3P1A1 (with previous C.S). at 32 weeks 1 day gestation in second stage of labour with obstructed labour presented with C/O of pain abdomen since 6 hrs. Her single antenatal check-up done in a private clinic was unremarkable. The patient was married for 8 years. The patient and her husband were non-consanguinous and there was no history of consanguinous marriages in her family. The present pregnancy was conceived spontaneously and the patient denied any contact with potential hazards. Her past history was unremarkable. Her family history was not relevant for any congenital anomaly or for history of twinning. Her menstrual history was regular with average amount of flow per cycle, but she was unsure about her LMP. Her previous caesarean section was done for breech presentation 5 years back. She had one induced abortion at 2 months gestational age, 3 years back. She had one previous obstetric USG in the present pregnancy at 25 weeks 5 days(acc. to her LMP) which showed twin living foetuses of 31 weeks 4 days, both in vertex presentation during the scan.

On examination she was moderately pale with stable vitals. On per abdomen examination: uterus was term size, multiple fetal parts felt, and the lie of the first fetus was longitudinal. Contractions were adequate with 2-3 contractions per 10 mins, each lasting 30”-45”. Relaxation was good in between the contractions. FHS were not audible. On inspection of vulva, the head and both the hands of the first fetus was outside the introitus.

She was resuscitated with i.v. fluids and again given a trial for vaginal delivery, but failed, upon which a decision for L.S.C.S was taken. On examination under anaesthesia: head and both hands of one fetus was visible outside introitus and on p/v multiple abnormal parts were felt. Decapitation of the head of the first fetus was done and the rest of the baby was delivered by L.S.C.S by breech extraction. The scar of previous L.S.C.S. was thinned out.
The baby was conjoined female (fresh stillborn, parapagus dicephalus tetra-brachius tripus) with 2 heads, 4 upper limbs and 3 lower limbs, and a single umbilical cord. There was one pair of labia majora with a single anal opening. Baby wt. was 3.5 kg. Placenta was mono-chorionic and monoamniotic.

Intra operative and post operative periods were uneventful.

Post mortem examination of the twins revealed the following anomalies:

A) **On gross examination:**
   
   There were two heads with normal calvariae. There was one pair of nipples on the thorax. All the four upper limbs were normal with 5 digits in each hand. The three lower limbs formed a tripod arrangement. The left and right lower limbs were normal with five digits on each foot. The posterior limb was malformed with marked dorsiflexion and 5 digits. A single pair of labia was noted externally with a single anal opening posteriorly.

B) **On internal examination:**
   
   Two complements of neck organs and two vertebral columns were demonstrable. There was a single rib cage with a single sternum anteriorly. There were two normally developed oesophagus. The right trachea continued to a right-sided pair of normal lungs and the left trachea continued to a left sided pair of lungs. There was a single pericardial cavity containing two incompletely separated hearts; the left atrium of right heart and the right atrium of left heart being fused together.

   There were two domes of diaphragm with a large diaphragmatic defect posteriorly through which the intestines herniated into the right side of the thoracic cavity.

   In the abdominal cavity, there were two separate stomachs with two separate duodenums up to a length of 5 cm; thereafter there was a single g.i tract up to the anus. There was one large fused liver under the right dome of diaphragm with two biliary systems and two gall bladders. There was a single spleen under the left dome of diaphragm which was common to both the twins.

   There were three kidneys with three ureters which opened into two separate bladders. The suprarenal glands could not be identified. Two sets of uterus with tubes were seen.

   There was one rudimentary sacrum which consisted of fused left ala of right twin and right ala of left twin. There were two iliac bones with a single symphysis pubis.

   The placenta and umbilical cord were normal.

**Discussion:**

'Dicephalus' is a subset of parapagus, in which the twins share a common body from the neck or upper chest downwards, having a pair of limbs and a set of reproductive organs (6). This anomaly represents less than 0.5 % of all the reported cases of conjoined twins (7).

Most authors report that 70-95% of the conjoined twins are females (8,9) one study cited a nearly equal male: female ratio (9). The reason for a greater number of females in most series of conjoined twins is not known. Milham suggested that it might be due to the early loss of conjoined male embryos (10).

Conjoined twinning arises when the twinning event occurs at about the primitive streak stage of development i.e., at about 13-14 days after fertilization and it is always associated with the monoamniotic, monochorionic type of placentation (11).

Approximately 40 to 60 percent of all conjoined twins are stillborn. Of those that are born alive, approximately 35 percent live only one day. Survival rates of conjoined twins hover between 5 and 25 percent. The frequent anomalies which are associated with conjoined twinning are the duplication of the visceral organs, omphalocele, facial clefts, meningomyelocele, an imperforated anus and cardiac defects (12) .Spitz (13), in a study of conjoined twins, concluded that one third of those born alive have severe defects for which surgery is not possible. Similarly, Golladay et al. (14) observed that surgical separation is feasible only when the upper portions of the trunks are sufficiently separate to provide a stable rib cage for each infant. Owolabi et al. (15) suggested that termination of pregnancy should be advised in cases where dicephalic twins are detected early in utero.
Parapagus dicephalus tetra-brachius tripus

Two incompletely separated hearts within a single pericardial cavity

Single large liver with a single spleen

Two separate vertebrae with a single sacrum

Single sternum with rib cage

Two incompletely separated hearts

Two incompletely separated hearts
There is no treatment prior to birth for conjoined twins. The only possible treatment after birth is surgical separation.

The success of surgical separation depends largely on the internal organs shared by the twins. In cases where the twins share one heart, surgical separation is not possible without killing one of the twins. As of 2010, there are no known survivors of surgical separation involving hearts joined at the ventricular level. Those joined at the sacrum or base of the spine have a high survival rate after separation, as high as 68 percent.

With the advent of high resolution ultrasonography, conjoined twins can be picked up as early as the 8th week of gestation and with fetal echocardiography as well as ultra fast magnetic resonance imaging, evaluated for possibility of postnatal survival (16).

However, most of these facilities are lacking in many of our country's institutions. Moreover, many of the patients do not register for ANC due to poverty and being ill-informed, as in our case. As a result, prenatal diagnosis of congenital anomalies is unlikely in our region.

Conclusion:

This case emphasizes the need for ANC with careful prenatal ultrasound monitoring of high-risk pregnancies in order to determine the nature of the perinatal management required. When serious malformations that are incompatible with postnatal life are diagnosed early enough, the family has the option of terminating the pregnancy. Therefore, there is a need to improve our health care delivery system to make such services available and accessible to all our pregnant women. Similarly, it is important to educate the women and their spouses on the need for proper ANC.

References:

Left Ventricular Aneurysm – Traced from a Chest X-ray

G. Kar¹, T. Mohanty², H.K. Sethy², G. Panda³, J. Patanaik⁴, S. Das¹, B.R. Mishra⁵

Case Report

A 39 year old male presented with complaints of chronic rhinorhoea with sinusitis for 4 years and breathlessness which was insidious in onset, gradually progressive and more on exertion since last three years. History of dust allergy was present. There was no history of angina, neither there are any coronary risk factors present. General examination and vital parameters were within normal limits. On systemic examination there was bilateral diminished breath sound with bilateral polyphonic rhonchi present over whole of chest. Apex beat was in 6th intercostals space in mid-clavicular line and sustained in nature, there were no murmurs.

Investigations:

All blood parameters were within normal limits, Spirometry showed FEV1/FVC 62% and post bronchodilator reversibility 29%, suggestive of Bronchial Asthma. Chest X ray (PA and lateral) showed an oval shaped soft tissue shadow with calcification (Figure 1) mimicking cystic lung diseases/lung mass. Investigation was done to exclude cardiogenic cause of breathlessness. ECG showed pathological Q waves in lead II, III and aVF, indicating old inferior wall myocardial infarction. 2D echo showed a true aneurysm of the basal posterior segment of LV with thinning, scarring and calcification, there were no clot inside the aneurysm. Echo findings confirmed the abnormal x-ray shadow to be a left ventricular aneurysm (Figure 2). The left ventricular ejection fraction was 45%. Coronary Angiography revealed a double vessel disease with 100% stenosis of proximal right coronary artery and 90% stenosis of Left circumflex artery before the 1st obtuse marginal branch.

Diagnosis

The patient was diagnosed to have Bronchial asthma with a Left ventricular aneurysm following a silent myocardial infarction.

Treatment

Patient received standard treatment for coronary artery disease, left ventricular dysfunction and left ventricular aneurysm along with conventional treatment for bronchial asthma. Patient is doing well at 6 month of follow up.
Discussion

Left ventricular aneurysm is a segment of the ventricular wall exhibiting paradoxical systolic expansion usually due to coronary artery disease (CAD). Ventricular aneurysms usually present with dyspnoea on effort, angina and ventricular arrhythmias. In a case of bronchial asthma a silent myocardial infarction (MI) later progressing to ventricular aneurysm may go unnoticed. It may be detected during a routine X-ray because of abnormal cardiac shadow or during an echocardiography when a superimposed cardiac cause of dyspnoea is to be ruled out. Although silent MI are common in diabetics, our case does not have diabetes.

Conclusion

We presented a case of bronchial asthma with an unusual shadow in chest X-ray which was later confirmed as left ventricular aneurysm due to coronary artery disease.

References

Retained Foreign Body in Thorax – A Rare Case Report After 32 Years

A. Mishra¹, S. K. Sahu², S. K Mohanty¹, M. Kar¹

Abstract:
Retained Foreign Body in the thorax are quite rare and diagnosis is difficult. We report a very rare case of retained piece of pulmonary parenchymal chest tube diagnosed 32 years after insertion. It should be considered as a differential diagnosis of unresolved lung infection or opacity and must be operated as soon as possible because it would be a nidus for recurrent infection.

Key words: chest tube, foreign body; thorax

Introduction:
Foreign body may penetrate soft tissue through open wounds and laceration during trauma or by direct impact.[1] Foreign bodies in the Chest are very uncommon and mostly due to penetrating injury to chest or rarely due to some iatrogenic cause. However, if these foreign bodies are left undetected in the tissue, they may result in serious sequel days, months or even years after the initial trauma. Pulmonary parenchymal foreign bodies are a rare cause of pulmonary disease and also a rare differential diagnosis of lung opacity on chest radiography.[1-3] Only several cases of retained pulmonary foreign body have been reported in medical journal. [2-3] We report a very rare case of retained piece of pulmonary parenchymal chest tube diagnosed 32 years after insertion.

Case Report:
A 38 years of young male presented in our Dept. of Surgery with intermittent foul smelling discharging sinus of pus from the right chest wall since early childhood. Patient had chronic intermittent cough with purulent sputum and occasional shortness of breath. Patient also had a long history of treatment for respiratory tract infection which was resolved with antibiotics. The patient was thin body built, emaciated with retarded growth. Physical examination showed finger clubbing and few pulmonary crackles in right lower hemithorax. A pus discharging sinus was found in the lower lateral aspect of the right chest wall.(Fig1)

The patient had normal laboratory data except for mild elevated leucocyte count. The evaluation of the patient for tuberculosis and wegener's granuloma was negative.

The obtained chest radiography showed a pulmonary thick wall cavity with surrounding consolidation and a air fluid level within the cavity.(Fig 2,3) The patient was further evaluated with CT scan. CECT of the thorax revealed a large right lower lobar intrapulmonary cavitory lesion with a tubular FB within - s/o intra-thoracic tubular foreign body. (Fig 4) This cavitory lesion is seen communicating with the cutaneous sinus tract. Bronchiectatic changes & few pneumatic infiltrates noted in the residual right lower lobe basal parenchyma.

Based on the suspicion of a tubular foreign body, the patient was further questioned. History revealed injury to the right chest wall at the age of 6 years for which a chest tube was inserted and was removed later in some other hospital.

Surgery was performed with lobectomy of right lower lobe along with excision of the cutaneous sinus tract. The excised lung was a multiple collapsed fibrotic cavity of pus with complete destruction. The specimen contained a retained piece of chest tube of size 6x2x1 cm enveloped in granulation tissue & fibrosis.(Fig 5)

Discussion:
In Lewis’ practice of surgery (1944):there is an extensive amount of data on aspirated foreign bodies in thorax, but very little on the subject on the penetrating bodies[4].Foreign bodies are known to cause chronic empyemas, though infrequently. In a large series of 622 cases of chronic empyema, only seven were due to foreign bodies. Retained chest tubes have been the
The retained material may induce aseptic foreign body reaction with fibrosis and granuloma formation, complicated with septic processes such as empyema and bronchopleural fistula. In Christopher's well-known book appears the statement, "Retained foreign bodies introduced from without should be removed, because otherwise they give rise to rapidly spreading infection and result in lung abscess, gangrene, empyema and suppurative mediastinitis." Foreign bodies in adults are infrequent, however, and the radiologic findings of these unusual circumstances have rarely been described and classified thoracic foreign bodies into three types according to their cause: Type I, Aspiration, Type II, Trauma or Accident; Type III, Iatrogenic. CT scan is the method of choice in the evaluation of suspected patients and may be variable according to the location and chronicity of the foreign body.

Although rare, the condition usually has medico legal importance. But on occasion, such as the present case or other cases in the literature may produce diagnostic dilemma in clinical practice. The patient recovered well, but only after an amazingly quite long interval of 32yrs. This was mainly because of forgetful history of chest tube insertion at an very early age, which was never perceived to be a potential cause by the patient and also by the treating clinicians in their missed history of this rare possibility. CT scan is the method of choice in evaluation of suspected patients. Surgical resection is an acceptable form of treatment for longstanding foreign body associated with an irreversibly damaged lung segment. The unusual long history along with a missed history in the early childhood was the main reason of diagnostic difficulty in this particular case.

Fig 1; Sinus in right lateral chest wall

Fig 2; X-ray chest showing cavitory lesion right. lower lung

Fig 3; Lateral X-ray chest showing cavitory lesion

Fig 4; CECT Thorax showing cavitory lesion lower thorax with Foreign body
Fig 5; Lobectomy specimen with Foreign body retained chest tube

References:
6. Drucker EA, Delucas SA. Retained surgical sponges and intraabdominal abscess Am farm Physician 1984 30; 125-126
8. Tae Jung Kim, MD, Jin Mo Goo, MD, Min Hoan Moon, MD, Jung-Gi Im, MD, and Mi-Young Kim, MD2 Foreign Bodies in the Chest: How Come They Are Seen in Adults? Korean J Radiol. 2001 Apr-Jun; 2(2): 87-96.
Abstract:
Deficiency of 21 hydroxylase enzyme (21OH) activity accounts for 90% cases of congenital adrenal hyperplasia (CAH). This result in deficient cortisol, increased ACTH, adrenal hyperplasia and increased adrenal androgen secretion. There is marked virilization in genetic females which is the hallmark of this disorder. Genetic heterogeneity in 21 OH deficiency is well recognized, and both severe and mild forms occur.

Key words: hirsutism, congenital adrenal hyperplasia, 21 hydroxylase enzyme deficiency, virilization in females.

Introduction:
Congenital adrenal hyperplasia (CAH) is an inborn error of metabolism in steroid hormone synthesis in the adrenal cortex and transmitted as an autosomal recessive trait, it is also the most common cause of ambiguous genitalia in newborn. In 90-95% of the cases, it occurs due to deficiency of steroid 21-hydroxylase enzyme (21OH). This deficiency results in decreased synthesis of cortisol and aldosterone and overproduction of adrenal androgens.

Depending upon the degree of enzyme deficiency the synthesis of aldosterone and androgens is affected in different ways thus producing a wide range of presentations. In its severe form the newborn males and females present with salt wasting crises (SW-CAH) or females present with features of prenatal virilization (SV-CAH), often giving uncertainty in sex assignment and requiring cumbersome genital surgery. Mild forms, also known as late onset, non-classical (NC-CAH) can present with menstrual disturbances, infertility, hirsutism in adult females; infertility and acne in adult males. Clinical variation is due to different mutations in the gene, CYP21 encoding the enzyme 21 OH. Specific mutations produce a given degree of enzymatic compromise and give rise to various clinical forms of 21OH deficiency. Patients deficient in 21OH activity are divided according to their predicted enzyme activity in relation to the genotype found into; null, A, B and C mutations. In Null group, there is complete enzyme inactivation and patients manifest with severe salt wasting. Mutations in type A produces low but measurable enzyme activity and patients can present with neonatal virilization both with and without SW. Type B mutations are less severe and are associated with neonatal virilization without salt wasting. Group C mutations are associated with late onset disease. Therefore, genotyping is used to predict the clinical outcome in patients with 21-OH deficiency and is a useful way to grade the severity of the disease and predict the therapeutic interventions with cortisol and aldosterone.

Prenatal diagnosis can be made by DNA analysis of chorionic villus or 17-OH progesterone in amniotic fluid, so that affected females are treated in utero with dexamethsone 0.02 mg/kg/d throughout pregnancy, to reduce the virilizing genital malformation in high risk pregnancy.
Case Report:

We report the case of a 19 years old unmarried female patient, who was referred to SCB Medical College, cuttack for hirsutism & oligomenorrhea. She had mild clitoromegaly at birth & no history of other neonatal illness. Her only brother was normal in growth & sexual development. There is no other relevant family history. She had undergone clitoroplasty at the age of 5 years. Her pubertal changes started at the age of 7-8 year. Her height was 166 cm (more towards the higher side compared to the height of her parents). Her BMI was 20.1 kg/m2 & blood pressure was normal. Her secondary sex character were normally developed (Tanner stage was B4P4A2), her external genital organs were normal. She had only mild hirsutism on her upper lip (Ferriman-Gallwey score=2). The pelvic ultrasound revealed a normal uterus and ovaries. The X-ray of the hand revealed closed growth cartilages. Serum pituitary and adrenal hormonal levels were within normal range, except increased androgens: 17 OH-progesterone=64.70 ng/ml (normal range 0.07-1.7), dehydroepiandrosterone sulphate=368?g/dl(45-270), androste-ndione=19.5 ng/ml (0.3-3.5), testosterone=1.49 ng/ml (0.14-0.76). The abdominal computed tomography showed bilateral adrenal hyperplasia. She was discharged with dexamethasone 0.5mg once daily at the hour of sleep and asked to follow up after 3 month. She was advised to take the help of endocrinologist during infection, injury or surgery.

Discussion:

Individuals with NC-CAH generally present with signs and symptoms of androgen excess rather than symptoms reflecting glucocorticoid deficiency. These symptoms can begin at any time in life and may start in early childhood. They are often mistaken for premature puberty - girls with signs of puberty before age 8 and boys before age 9. It is progressive, meaning that the untreated symptoms may become worse over time.

Children may present with premature pubarche (i.e. the development of pubic hair, axillary hair) and/or increased apocrine odor, additional features include rapid growth spurt, but ultimately short stature on becoming adult, oily hair and skin, severe acne, mood swings, infertility. In females, additional symptoms may be found i.e. early menarche, menstrual irregularities, thinning hair on head, especially at the temples (male pattern baldness), facial hair on chin and upper lip.6 Polycystic ovary morphology may be present in about half of women with NC-CAH.

Individuals with the salt-wasting and simple virilizing forms of CAH are generally recognized in the newborn period, and most affected females are detected by the genital ambiguity. Without a family history, males with classic CAH are identified through newborn screening programs. In general, newborn
screening programs fail to detect individuals with NC-CAH. Laboratory techniques used to measure 17 OH-progesterone include radioimmunoassays (RIA), enzyme-linked immunosorbent assays (EIA) and time-resolved fluoroimmunoassays (FIA) may be sufficient to make the diagnosis of CAH. An ACTH stimulation test is done to confirm the diagnosis which is now rarely done.

The fault in CAH is an under production of cortisol. This is easily replaced by giving the hydrocortisone (6-15 mg/m2/day divided into three daily doses) which is more physiological than other steroids. Other corticosteroid drugs such as prednisolone or dexamethasone can be given which have once per day dosage and better patient compliance. However limitations of dexamethasone are its excess weight gain and patients prefer to take hydrocortisone twice or thrice a day. Multiple dosage of hydrocortisone is required to suppress androgen hormone production during the night which is the peak time for production. In a few patients salt wastage may require replacement with the hormone fludrocortisone but this is not usual for the adult onset type of CAH.

The present case is a case of non classic CAH. She was underweight hence for convenience of dosage dexamethasone was given. As the steroid requirement increase during the periods of stress, she was advised accordingly.

**Conclusion:**
Congenital adrenal hyperplasia (CAH) frequently remains undiagnosed during the newborn period in our population due to lack of awareness in the society and lack of proper diagnosis by the primary physician as it has an autosomal recessive mode of transmission. Hence routine screening of all new borns should be done to exclude CAH.

**References:**
Left Poland Syndrome With Dextrocardia with Two Superior Venacava
S. Dash¹, T. Mohanty², S. Das³, H.K. Sethy², J. Patnaik⁴

Introduction:
Poland syndrome is a sporadic condition characterised by unilateral absent of one or more portion of pectoralis major muscle. Occurs 1 in 25,000 live births with male to female ratio of 3:1 [1]. Dextrocardia, lung herniation, renal, vertebral and lower limb malformations have been described in rare cases [2]. Association of dextrocardia in Poland syndrome is extremely rare [3]. Most of the cases are sporadic but some familial cases have also been reported. Right side is more commonly affected with right to left ratio is 3:1[2]. There are also infrequent reporting of bilateral Poland syndrome. It is hypothesized that a momentary interruption or reduction in the circulation of the subclavian and vertebral arteries of one of their peripheral ramifications primes the pathogenetic mechanism of the syndrome and results in different degrees of severity depending on the length and intensity of the vascular interruption [2]. Because clinical features are highly variable and not all present in the same individual, patients with PS should undergo an accurate physical examination and investigations to exclude renal, cardiac, or other important anomalies.

Case Report:
A 48 year male presented to our setup with complaints of cough with mucoid expectoration for 15 days and breathlessness gradually progressive over 15 days. He is a shopkeeper by occupation with no addiction. No significant past or family history.

Examination:
PR-96/min, BP- 110/80 mm of Hg, RR-23/min, SPO2– 96%.

¹PG Student, ²Assoc. Professor
³Asst. Professor
⁴Professor and HOD
Department of Pulmonary Medicine
S.C.B. Medical College, Cuttack, Odisha, India. Pin- 753007
Contact : 9861427042, e-mail : sampatdash@gmail.com
Submitted : 27.05.2013, Accepted : 15.06.2013
© OMJ 2014

Chest-
- Flattening of left hemithorax
- Increased in drawing on left side
- Rudimentary development of left nipple.
- Bilateral vesicular breath sound with expiratory rhonchi present.

CVS-
- Apex beat in 5th intercostal space ½ inch medial to mid clavicular line on right side
First and second heart sound was normal with no murmur.

**Investigation:**

**Blood parameters:**

Hb- 12gm/dl, TLC- 12400, DC- N80, L20. All other blood parameters are within normal limit.

**Radiology:**

CXR- Left hyperlucent lung field with dextrocardia. No rib abnormality seen.

CECT- Absent left side pectoralis major muscle with dextrocardia and persistent left superior vencava. (Poland syndrome). All other great vessels are normal.

ECHO- F/S/O Dextrocardia.

**Bronchoscopy:**

Narrowing of left upper lobe bronchus.

**Discussion:**

Poland syndrome is a rare congenital anomaly that was first described by Alfred Poland in 1841. The right side of the body is affected three times more frequently than the left and it is more common in boys than in girls [1]. It comprises of different anomalies principally at musculo-skeletal system, lungs, heart and kidneys. Thorax deformity is the most common feature of this syndrome. It includes hypoplasia or absence of the pectoralis minor and the sternal head of pectoralis major muscles. The defect in the chest wall is variable with the absence or rudimentary development of the anterior portion of 2, 3, 4, 5th ribs and their costal cartilages. Breast together with nipple can be absent or underdeveloped. Ipsilateral hand anomalies can be seen as brachydactyly, syndactyly or ectrodactyly and are most important features of the syndrome1,2,3. Different etiologic factors of Poland syndrome are taken into account: genetic, vascular compromise during early stages of embryogenesis, but also teratogenic effects of environmental xenobiotics.

Association of dextrocardia with Poland syndrome is reported only in less than 20 cases [4]. In all the reported cases it is associated with rib defect and there is simply dextroposition: heart is simply displaced to right [4,5,6]. Dextrocardia was reported in 5.6% of a series of 144 patients with Poland's syndrome, and in 9.6% of those, the defect was left-sided [7]. This relatively high number suggests that dextrocardia may be a part of Poland's complex and that it may be caused by a disturbance of vascular development rather than being the initial phase in the Poland's sequence. Although isolated dextrocardia is almost always associated with other cardiovascular anomalies, dextrocardia in Poland's sequence is not.
However in our case we donot found any rib abnormality and there is dextrocardia instead of dextroversion (heart is rotated to right side) with two superior venacava (persistent left superior venacava draining to coronary sinus). So, there are no rib abnormalities but congenital abnormality of great vessel.

Our case put a question mark on the hypothesis that the combination of Poland syndrome and dextrocardia is not coincidental and dextrocardia may be part of the Poland syndrome, especially left-sided and that the mechanical factors during embryonic life that is partial agenesis of 2 or more ribs is needed to displace the heart toward the right side. So, further studies would be required to confirm the relationship between these unusual combinations.

Bibliography :
Abstract

Leprosy, a chronic infectious disease caused by Mycobacterium leprae with clinical manifestations of which are largely confined to the skin, peripheral nervous system, upper respiratory tract, eyes & testes but can rarely present as a reactional state with fever as the presenting complain. Here we describe an uncommon presentation of leprosy (type 2 lepra reaction) as pyrexia of unknown origin with generalised lymphadenopathy without the skin manifestation occurring in patient having no history of leprosy.

Introduction:

Pyrexia of unknown origin (PUO) was defined by Petersdorf & Beeson in 1961 as (1). Temperature of >38.30°C (101°F) on several occasions. (2). Duration of fever of > 3wks. (3). Failure to reach a diagnosis despite 1 wk of inpatient investigation.

This definition was revised in 1991 by Durack & Street classified fever of unknown origin as (a)Classical FUO ( b) Nosocomial FUO (c) Neutropenic FUO ( D)FUO associated with HIV infection.

PUO has always been a challenging problem in clinical medicine. Although varied causes like connective tissue disorder & malignancy are implicated, infections still continue to account for majority of PUO in our country. Leprosy though found to have unique tropism for skin & peripheral nerves can also present as PUO as we have presented here.

Case report

A 22 year old young male from Berhampur presented with chief complains of fever for 45 days duration along with pain & swelling of knees, elbows, ankles for last 15 days. The fever was continued, mod- high grade was not associated with any dysuria, chest pain, shortness of breath, cough & expectoration, no headache, no history of skin rash & photosensitivity & no history of morning stiffness. A month latter he noticed pain & swelling in the knees & gradually involved the ankles, elbows over a week. No h/o suggestive of involvement of small joints of hand/legs, the vertebrae & axial skeleton, there was no fleeting of joint pain. There was marked limitation in the...
movements in the involved joints. He had no h/o contact with tuberculosis patients. He is a nondiabetic. He had normal bowel & bladder habits, normal appetite. Prior to this hospital visit he was treated by private practitioner with antimalarials & antibiotics. Patient was admitted and was started on antibiotics empirically.

On examination patient was febrile 102°F, Pulse rate 90/min, blood pressure 116/70 mmHg. Patient was normal built and had fair complexion with mild pallor & generalised lymphadenopathy (supraclavicular, cervical, axillary, inguinal & epitrochlear lymph nodes were enlarged size ranging from 1-2.5 cm, globular, firm in consistency, with no sinus/fistula, freely mobile with tenderness) & arthritis of both elbows, knees & ankles. No peripheral nerves were thickened/tender & no hypoesthetic patches were found. Systemic examination (cvs, cns & resp.) revealed no abnormality.

His haemogram revealed normocytic mild hypochromic RBCS (HB-6.8%), neutrophilic leukocytosis (18,900/mm3) with 78% polymorphs, platelets - 4.2 lakh/mm3, no abnormal cells were found in the peripheral smear. ESR was elevated 150 mm in 1st hour, his other parameters like serum urea -56mg/dl, serum creatinine 1.5mg/dl his liver function test was within normal limits, urine revealed no abnormality. HIV, HBsAg & VDRL were negative. No organisms were isolated from urine & blood culture. Ultrasonography & 2-D ECHO revealed no abnormality. FNAC from the right supraclavicular lymph node showed epithelioid cell cluster over an inflammatory background hence giving impression of tubercular lymphadenitis. Then the patient was started on antitubercular drugs. After 2 days we noticed multiple corps of erythematous papules of size varying from 0.5 -1 cm over the flexor & extensor aspect of both forearms & face which were painful in nature prompting us to stop anti tubercular drugs & review the diagnosis. (erythema nodosum leprosum was thought of). Again the patient was sent for skin smear & FNAC of the cervical lymphnode which revealed globi of AFB in ZN stain. After this he was started on prednisolone 1mg/kg/day, later on started on MDT. The symptoms gradually resolved over 2 weeks.

**Discussion**

Leprosy is a chronic, slowly progressive granulomatous infectious disease caused by Myco. leprae. Current prevalence in our country is 0.88/10,000 population(1). Though it has special predilection for skin & nerves sometimes a change in immunologic state of the patient leads to a reactional state i.e type 1 & 2 (erythema nodosum leprosum).

ENL occurs in patients of lepromatous leprosy / borderline lepromatous leprosy usually associated with MDT (multidrug therapy) but can also be seen in untreated patients (2). ENL can be the only manifestation of the disease without prior h/o leprosy(3). It can be precipitated by surgical procedures, infections, trauma, vaccines & drugs. ENL commonly associated with skin lesion like crops of erythematous tender palpable popular, nodular lesion in the face & extensor aspects of the limbs but are usually symmetrical in nature. Less commonly the lesions may be hemmorhagic, vesicular, erythema multiforme like, pustular or ulcerating (4).
It can also be associated with fever, polyarthritis, lymphadenopathy, immune complex glomerulonephritis, iridocyclitis, orchitis. Other extracutaneous manifestation are hepatosplenomegaly, leukocytosis, generalised edema, epistaxis, proteinuria, rhinitis. Histologically there is intense vasculitis with neutrophilic & lymphocytic infiltration with granuloma made up of foamy macrophages filled with M leprae.

Sometimes when fever is the presenting complain without obvious skin lesion, nerve thickening & prior h/o leprosy the diagnosis of leprosy becomes difficult. But only few cases of ENL lymphadenitis have been reported without skin lesion(5). Our patient had fever, acute poly arthritis, generalised lymphadenopathy, neutrophilic leukocytosis, mild renal impairment. Generalised lymphadenopathy with mycobacterium leprae in lymph node has also been reported(6). The presentation with fever, acute polyarthritis & generalised lymphadenopathy led us to the diagnostic possibilities of lymphoma, tuberculosis, connective tissue disorder, infective endocarditis. Later as the skin lesions developed after the initiation of antitubercular drugs prompted us for further workup with skin smear & FNAC of the lymphnode. Presence of globii in skin smear & lymph node conformed the diagnosis of leprosy. Hence physician should have their diagnostic options for leprosy which has varied manifestations.

**Conclusion**

Leprosy specially leprae reaction can rarely present without obvious skin lesion. There may be associated polyarthritis & generalised lymphadenopathy. Hence physician should be aware of this possibility especially in Southeast Asian countries?

**Reference**

Cervical Pregnancy : A Rare Case Report
S.K. Nayak¹ · M. Agarwal¹, K.R. Mohapatra³

Introduction :
An ectopic pregnancy is one in which the fertilized ovum is implanted and develops outside the normal endometrial cavity. Cervical pregnancy is a rare (1:1000 to 1:16000 pregnancies) variant of ectopic pregnancy when the implantation occurs in the cervical canal at or below the internal os. The condition is commonly confused with cervical abortion. In cervical pregnancy bleeding is painless & the uterine body lies above the distended cervix. Intractable bleeding following evacuation or expulsion of the products brings about suspicion. The morbidity & mortality is high because of profuse haemorrhage.

Case Report :
Mrs. MINAKHI SINGH, 28yrs old Hindu female, resident of Kendrapara came to GOPD on 2nd of January, 2012 with chief complain of bleeding p/v since one month following intake of misoprostol and mifepristone. She delivered a term male child by LSCS 6 months back and since then she is in lactational ammenorrhea. She did her urine pregnancy test on 29th of November, 2011. It came out to be positive. Then she took misoprostol and mifepristone for medical termination of pregnancy on 1st December, 2011. Two days later she developed bleeding p/v which was associated with clots and continuing at the time of admission. The bleeding was painless. Bladder and bowel habits were normal. She was married since 5 years, G3P2, no h/o of any contraceptive use. On examination patient was moderately pale. The abdomen was soft, no tenderness with healthy scar. On pelvic examination cervix was healthy, bleeding through os was present, ut-av, 8wks size, soft mobile, fornices free, external os admits tip.

On investigation, Urine pregnancy test was +ve, Thyroid profile- FREE(T3)-3.0 pg/ml, FREE (T4)-1.0 pg/ml, TSH-3.2microunit/ml, SERUM HCG- 3,996.00 mIU/ml. USG report found to be Uterus size 8*7*6 cm with heterogeneous texture with irregular margins showing a gestational sac with MSD 2.7 cm= 7wk 5 days. Fetal pole and cardiac activity not appreciated. Impression- Early pregnancy failure with gestational trophoblastic hyperplasia.

Dilatation and Suction and evacuation under short G.A. was done. Minimal amount of product of conception came out and then there was grating sensation which was followed by profuse bleeding. The procedure was abandoned. Ribbon gauge pack was given. Laparotomy with total hysterectomy was done and there was bladder injury which was repaired. Uterine cavity was cut open, cavity was found to be empty. Length of cervical canal was 6 cm. POC adherent to upper part of cervical canal. Post op period was uneventful. Total 3 units of blood was given.

HISTOPATHOLOGY REPORT showed-

1. GROSS :- Uterus with multiple bits of spongy tissue arising from endocervical canal.

2. MICROSCOPIC :- Features of cervical gestation.

Discussion :
Criteria for the diagnosis of cervical pregnancy (RUBIN – 1911)
1. Cervical glands must be opposite the placental attachment.
2. Placental attachment to the cervix must be situated below the entrance of the uterine vessels or below the peritoneal reflection of the anterior and posterior surfaces of the uterus.
3. Fetal elements must be absent from the corpus uteri.

Because strict anatomical and histological criteria necessitate a hysterectomy for a complete study of the entire uterus, Palman and McElin proposed 5 more
clinically practical criteria for the diagnosis of this condition.

1. Uterine bleeding without cramping pain following a period of amenorrhoea.
2. A soft, enlarged cervix equal to or larger than the fundus (the hour glass uterus).
3. Products of conception entirely confined within and firmly attached to the endocervix.
4. A closed internal cervical os.
5. A partially opened external os.

**Treatment:**

The most effective treatment of cervical pregnancy is unclear.

**Medical Treatment:**

Single or multidose intramuscular methotrexate is effective in 80-90% of cases of early cervical pregnancy. No complications except for the usual side effects of methotrexate.

**Criteria for the use of methotrexate:**

a) Patient should be haemodynamically stable.

b) No fetal cardiac activity.

**Surgical Treatment -**

1. *Dilatation & Evacuation.* The main complication is a high incidence of severe haemorrhage which can be reduced by preoperative measures like transvaginal ligation of cervical branches of the uterine arteries, cervical encerclage, angiographic uterine artery embolization, intracervical vasopressin injection, balloon catheter tamponade of the implantation site after evacuation.

2. *Hysterectomy* is the last resort. It is desirable to avoid hysterectomy to enable future child bearing.

**Conclusion:**

Cervical pregnancy is a rare condition. On a very rare occasion, a cervical pregnancy results in the birth of a live baby, typically the pregnancy is in the upper part of the cervical canal and manages to extend into the lower part of the uterine cavity.

A cervical pregnancy can develop together with a normal intrauterine pregnancy; such a **heterotopic pregnancy** will call for expert management as to not to endanger the intrauterine pregnancy.

**References:**

8. TeLinde’s Operative Gynecology 9th Edition Pages 351-352
Introduction:

Chronic nonpuerperal uterine inversion is an extremely uncommon event. It is often associated with uterine pathology like leiomyoma, leiomyosarcoma, rhabdomyosarcoma, endometrial polyps, endometrial carcinoma, and uterovaginal prolapse as possible preceding factor. Uterine leiomyoma is known to cause uterine inversion in 78.8%-85% of cases and was the most common cause. Three contributing factors proposed for uterine inversion are 1) sudden emptying of the uterus which was previously distended by a tumor 2) thinning of the uterine walls due to an intrauterine tumor, and 3) dilatation of the cervix. The following is a case report of a woman who presented hospital with nonpuerperal uterine inversion secondary to a large intramural fibroid.

Case Report:

A 32-year-old HF P1L1 attended Out Patient Department of S.C.B Medical College & Hospital Cuttack on Nov 2012 with complain of something descending per vaginally and dragging pain abdomen for 1 day. The patient had past history of similar but incomplete descend for last 1 year. She was married for 3 year and last child birth was 2 yr back. On examination patient was moderately pale and there was a mass of size 20×15×8 cm visible outside vulva. The mass was tender and was bleeding on touch. Examination under anesthesia revealed complete uterus, cervix and vagina were outside (total inversion) and both Mackenrodts and uterosacral ligaments were palpable. Tubal openings were not visible on surface of uterus. On USG pelvis, bilateral tubes and ovaries were only visible and uterine cavity was intact and Cervical canal and vagina was repaired. Post op period was uneventful and on USG post operatively anteverted uterus with bilateral tubes ovary in pelvis.

Discussion:

Non-puerperal uterine inversion is very uncommon, with no published figures regarding its incidence. Non-puerperal uterine inversions generally occur due to the traction effect by a submucous myomatous polyp arising from the fundus, a senile inversion following high amputation of the cervix due to cervical atony and incompetence or malignancies (leiomyosarcoma, rhabdomyosarcoma, endometrial polyps, endometrial carcinoma).

The clinical diagnosis of chronic inversion depends on finding a mass coming through the cervix, without definite margins of a cervix, and the absence of the uterine body during bimanual or rectal examination. Openings of the fallopian tubes may be identifiable on its endometrial surface. The uterus when fully inverted generates tension on the vaginal wall, bladder and the urethra. This can cause the urethra to move from its normal anatomic location, approximately 2 to 3 cm inferior to the clitoris, to a sub-symphysial location making it difficult to locate. Also, the uterine cervix if completely inverted and flush with the vagina will be difficult to identify. Sometimes a constricting ring, representing the cervix, can be felt.

Preoperative evaluation with magnetic resonance imaging (MRI) has been described. Sagittal views demonstrate a U-shaped endometrial cavity, while axial
images show a bullseye configuration. Frozen section of the vaginal mass has been used by some authors for the diagnosis. Demonstration of the endometrium on the surface of the mass will confirm the diagnosis of chronic inversion. Biopsy of the mass will rule out the uterine malignancies.

Large Degenerated Intramural Fibroid: Mynectomy Done Vaginally.

Abdominal View of Reposed Uterus After Mynectomy

Many surgical techniques have been described, abdominal methods are Huntington and Haultain, and two vaginal surgeries: Spinelli’s and Kustner’s techniques. An attempt at vaginal restoration and removal has been reported but is difficult. Abdominal hysterectomy may be necessary, taking care to locate the distal ureters, with intraoperative cystoscopy to ensure bladder and ureteral integrity. The abdominal route is preferred over the vaginal as the incision of the uterus is reduced to a minimum, traction on the round and broad ligaments helps in reposition, the uterine wall can be more accurately sutured and haemorrhage more efficiently controlled. In cases where the uterus is preserved, recurrence is rare in subsequent pregnancies if good obstetrical care is given. Haultain himself has reported good pregnancy outcomes following the correction and we hope the same with our patient who is under follow up as she was desirous of further child bearing.

Conclusion:

Chronic uterine inversion is a rare condition that is difficult to manage. USG and MRI usually lead to definitive diagnosis and the treatment is surgical that includes both abdominal and vaginal approaches. However, need for preservation of fertility and excluding possible malignancy might be important in selected cases.

Repositioning the uterus may not be possible in all cases, leaving vaginal hysterectomy the only option. Having abdominal accesses in such situation will help in confirming the diagnosis, excluding any content in the inverted uterus, achieving better hemostasis of bleeding from reinverted pedicles.

Bibliography:

Bilateral Cancer Breast Treated with M.R.M. followed by Immediate Reconstruction with Bilateral Latismusdorsi Myocutaneous Flap

S. Mishra¹, K. Goutam², D. Biswal³

Abstract:
Here is a young female patient presented with B/L breast mass. Core needle biopsy shows intraductal carcinoma. She had a strong family history as her mother had ca. ovary & sister ca breast. She received NACT (Neoadjuvant chemotherapy) as in one side it is a LABC (Locally advanced breast cancer). With this background she came to us. We planned for one stage B/L M.R.M (Bilateral modified radical mastectomy) followed by reconstruction with bilateral L.D (Latismusdorsi) myocutaneous flap.

Introduction:
Bilateral breast cancer (BBC) is a rare clinical entity. There are several controversial issues regarding BBC pertaining to the diagnostic criteria, nomenclature, and management policies. Thirty out of 1100 (2.7%) patients with breast cancer treated between 1993 and 2003 had BBC, of whom 20 patients had metachronous and 10 patients had synchronous BBC. Family history of breast cancer was present in five patients (16%) only. Contralateral breast cancer (CBC) was detected mammographically in three and by clinical examination in 27 patients. Most CBC patients had early-stage disease compared with the index side (73% versus 27%). Fifty-six out of 60 tumors were found to be invasive ductal carcinoma, and none of the patients had lobular carcinoma.

History:
This young lady presented with bilateral breast mass. She had a strong family history, as her mother was suffering from cancer ovary & her sister from cancer breast.

Examination- Right breast-cT4b N2 M0. Left breast-cT2N0 M0


PLAN- NACT followed by surgery
She received 3 cycles of neoadjuvant chemotherapy. After preoperative discussion with patient & her family member it was planned for B/L breast cancer is one of the most devastating diagnosis for a woman. The woman faces not only the challenges of the cancer diagnosis but also the prospect of losing a defining part of her body. Breast reconstruction is crucial for a woman to regain her self confidence and identity again. We believe that by providing a woman with choices for breast reconstructions, we also empower her in the fight against breast cancer. The best outcome for breast cancer treatment requires a team approach which includes onco surgeon, medical oncologist, radiation oncologist, plastic surgeon & anaesthesiologist.

1Asst. Prof., Plastic Surgery
2Asst. Prof., Oncology
3Asst. Prof., Anaesthesiology
SCB Medical College, Cuttack,
Contact : 9437163199, e-mail : shakti_doctor31@yahoo.co.in
Submitted : 13.6.2013, Accepted : 30.6.2013
© OMJ 2014
M.R.M. with L.D. flap reconstruction in one stage.

OPERATIVE PROCEDURE - Pre op planning with marking for excision & reconstruction done. During excision care was taken to keep inframammary fold n LD pedicle. Preserving the named vascular pedicle was bit difficult due to difficulty in identifying the proper tissue plane in post chemotherapy setting. Reconstruction done with ipsilateral L.D. flap. Closer done in layers. Doner site primarily apposed. Romovac drain given in donor n reconstructed site. Same procedure carried out in other side.

Post operative period was uneventful. She had one unit of whole blood transfusion. Drain removed on 8th postop. day & she was discharged on 10th post op. day.

Discussion:
Marking before M.R.M. so that proper infra mammary fold was kept. Also during reconstruction initially marked in back so that scar of donor site will not be visible when pt. wears a low back neck blouse.

Tansini was first to use myocutaneous I.D. flap in 1985(3). The technique of skin over the muscle was popularized by Bostwick (2). Here splitting of muscle(3) was done with intact neurovascular bundle so that motor function can be preserved. Latismusdorsii i s a type V muscle with a single dominant vascular pedicle from thoracodorsal artery at its insertion & multiple secondary segmental pedicles originating from some of the lumbar & lower six intercostal arteries at its origin. It is commonly used in immediate breast reconstruction to replace skin, to add tissue to reduce the size of breast implant needed. As we know latismusdorsii the climbing muscle helps in abduction & internal rotation of arm & we are taking B/L L.D., part of muscle was left both at orgin & insertion so that some fuction of muscle will be there. Again as we have used myocutaneous L.D. flap there will be some bulk in bothside & reconstruction done in same sitting hence uniformity was tried to maintained. As the patient may need postoperative radiation hence silicone prosthesis was not advised. Takering stiches given while raising the flap to counteract shearing force & flap was raised adequately so that there will not be dragging.

Conclusion:
Breast reconstuction and conservation have become an integral part of breast cancer treatment and more and more patients are benefitting from an immediate reconstruction after mastectomy(2). The latismusdosi musculocutaneous flap continues to play an important role in such immediate breast reconstruction. This flap is reliable & its elevation is technically straight forward. Complications are few and results are predictable, especially in appropriately selected patients. Patient was young, having B/L cancer breast. There is strong family history. TRAM was not preferred as it was bilateral case, & pt. face difficulties in forth coming pregnancy. Hence L.D. option was left. More over after radiotherapy silicon prosthesis can be used. Also after scar settled both arm function was maintained, infra mammary fold maintained, bulging of breast was symmetrical. Two procedures left i.e. silicon prosthesis & N.A.C (nipple areolar reconstruction) reconstruction.

References:
Abstract:

Fraser syndrome is a rare autosomal recessive multisystem disorder with a reported incidence of 0.043 per 10,000 live born infants and 1.1 in 10,000 stillbirths [1]. The condition is characterised by cryptophthalmos, cutaneous syndactyly, laryngeal and genitourinary malformations, craniofacial dysmorphism, orofacial clefting, musculoskeletal anomalies and mental retardation. The diagnosis can be made on prenatal scans, post natal clinical examination or on autopsy findings.

Fraser Syndrome : A Case Report

C. Nayak¹, S. Swain², A.K. Nayak³

Case Report:

A young girl 14 years old was admitted with chief complaints of pain abdomen -4 months, abdominal swelling-2months. She was yet to attained menarche.

Clinical examination revealed she was thin built with average nutrition, Height-143 cm, weight-30 kg, BMI- 14.6 kg/m², Absent right eye- cryptophthalmos, Syndactyly in all 4 extremities, Deficient right ear helix, high arched palate, Well developed breast, Absent axillary and pubic hair.

Per abdomen- mass arising from pelvis of 28 wks size. Umbilical hernia present. IOV- well developed external genital organ, absent pubic hairs. P/V – Blind upper vagina.

TRANPERINEAL SCAN- Hematometra with hematocolpos a septum of size 1.3cm seen in the vagina. B- scan of orbit- atrophic right eye with chorioretinal detachment.

Treatment: incision and drainage of transverse vaginal septum and reconstruction of vagina under SA

Discussion

The earliest reports of what is now known as cryptophthalmos (hidden eye) date back to the first century A.D. Pliny the Elder described the Lepidus family in which three children were born with a membrane over the eye, typical of this rare anomaly.

The term cryptophthalmos was introduced by Ze-hender [2] et al. in 1872 who described a child whose eyes were covered by continuous sheets of skin from forehead to cheek, associated with additional malformations including hypertelorism, syndactyly, abnormal genitalia, umbilical hernia, anal stenosis and hoarse voice.

George Fraser [3] in 1962 was the first to group these features together under the term “cryptophthalmos syn-drome”. In fact, cryptophthalmos is not always a feature of this syndrome, and thus, the eponym Fraser syndrome is preferable for the condition.

Fraser syndrome is a multiple malformation syndrome with a probable autosomal recessive inheritance. It may be caused by mutations in two genes FRAS1 [4] (chromosome 4) and FREM2 [4].

Keywords: Cryptophthalmos, Fraser Syndrome

1PG Student
2Assoc. Professor
3Asst. Professor
Dept. of Obst. & Gyn
SCB Medical College, Cuttack
Contact: 9338008554, e-mail: ajitnayak_08@yahoo.co.in
Submitted: 16.6.2013, Accepted: 29.6.2013
© OMJ 2014
The FRAS1 extracellular matrix protein regulates epidermal-basement membrane adhesion and organogenesis during development. The FREM2 gene (chromosome 13) encodes the FRAS1-related extracellular matrix protein 2.

Thomas et al. in 1986 were the first to publish diagnostic criteria (see Table 1) for Fraser syndrome. The criteria were based upon a study of 124 cases. Two major criteria and one minor criterion or one major and at least four minor criteria were required for the diagnosis of Fraser syndrome.

Table 1. Diagnostic criteria for Fraser syndrome:
two major criteria and one minor criterion or one major and at least four minor criteria were required for the diagnosis of Fraser syndrome.

Major Criteria
Cryptophthalmos
Syndactyly
Abnormal genitalia
Sib with Fraser syndrome
Congenital malformation of nose
Congenital malformation of ears
Congenital malformation of larynx

Minor Criteria
Cleft lip +/- palate
Minor Criteria
Skeletal defects
Umbilical hernia
Renal agenesis
Mental retardation

Major Criteria
Cryptophthalmos
Syndactyly
Abnormal genitalia
Sib with Fraser syndrome
Congenital malformation of nose
Congenital malformation of ears
Congenital malformation of larynx

Minor Criteria
Cleft lip +/- palate
Minor Criteria
Skeletal defects
Umbilical hernia
Renal agenesis
Mental retardation

The patient we described fulfills the criteria for a diagnosis of Fraser syndrome. These criteria helped differentiate Fraser syndrome from isolated cryptophthalmos.

Feldman et al. reported the first prenatal detection of Fraser syndrome in 1985. Their diagnosis was based on microphthalmia and hydrocephalus at 18 weeks of gestation, with a previously affected sibling [6].

Conclusion:
14 yrs old female complaints of pain abdomen 4 months, swelling lower abdomen 2 months was diagnosed to have Fraser syndrome with hematometra and hematocolpos due to transverse vaginal septum and was treated with drainage of hematometra and reconstruction of vagina, with uneventful post op period.

References:
Unusual Complication of Sickle Cell Diseases

A.K. Sahu1, B. Nayak2, P.K. Padhi3, J.K. Panda4

Introduction:
The sickle cell disease is caused by a mutation in the globin gene in which sixth amino acid glutamic acid is replaced by valine. HbS polymerizes reversibly when deoxygenated to form a gelatinous network of fibrous polymers which make the RBC membrane stiff, increase viscosity, and cause dehydration due to potassium leakage and calcium influx. These changes also produce the sickle shape which lose the pliability needed to traverse small capillaries. The sticky membranes are abnormally adherent to the endothelium of small venules. It may lead to microvascular occlusion and premature RBC destruction. Spleen destroys the abnormal RBC causing hemolytic anemia. The rigid adherent cells clog small capillaries and venules, causing tissue ischemia, acute pain, and gradual end-organ damage. This venoocclusive component usually dominates the clinical course. Prominent manifestations include episodes of ischemic pain (i.e., painful crises) and ischemic malfunction or frank infarction in the spleen, central nervous system, bones, liver, kidneys, and lungs.

Musculoskeletal manifestations of sickle cell disease are infarction, marrow hyperplasia, spontaneous fracture, growth disturbance, osteomyelitis, arthritis (septic-reactive), dactylitis.

Avascular necrosis of the femoral head is common in sickle cell disease. (Milner et al) overall prevalence of 9.7%.

Case Study:
A 23yr old male patient was admitted to Dept of Medicine of SCB Medical College with complaints of pain all over the body, more on the buttocks and lower limbs. The patient is a known case of sickle cell disease since childhood. There was history of multiple blood transfusions. For last 3 yrs, the patient was limping and feeling difficulty in moving his lower limbs.

The lab investigations show- Hb-6gm%, TLC-10400/cmm, DC-N58, M3 LFT- Bil total- 4.5mg/dl, Bil direct-1mg/dl, AST-48, ALT-54, ALP-150. Hb electrophoresis shows- HbF-5%, HbS-78%, HbA-12%, HbA2-5%.

The X-ray was showing necrosis of head of right femur. It was surprising to find both the knee joints having fused femur with tibia. There was severe degree of bony ankylosis causing fusion of head of tibia, femoral condyles and patella.

Conclusion:
Bony ankylosis of the knee joints is a very rare feature of sickle cell disease. It may be due to repeated septic or reactive arthritis.

Reference:

1Senior Resident, 2PG Student
3Professor
4Associate Professor
Dept Of Medicine, SCB Medical College, Cuttack
Contact : 9337422652, e-mail : drashwiniscbmed@gmail.com
Submitted : 30.08.2013, Accepted : 05.09.2013
© OMJ 2014
Difficult intubation in a rare case of Pindborg tumor.
N. Moda1, M. Patel2, P. Verma3, S. Kandi4, D. Swain5, P. Patel6

Abstract:
Maxillofacial tumors not only obstruct bag and mask ventilation but also make intubation difficult. An adult male patient was posted for removal of a huge maxillofacial tumor in the ENT Dept. of VSS Medical College with complete distortion of facial anatomy. Preliminary examination revealed minimal mouth opening with significant bony distortion. Endoscopic guided intubation with superior laryngeal nerve block and sedation was planned. Intubation was smooth with help of fibroptic bronchoscope, intraoperative period was uneventful and recovery was complete. Patient was extubated in the operating room and shifted to postoperative recovery unit. Further hospital stay was without any complication.

Key words: Pindborg tumor, airway distortion, endotracheal intubation, fibro-optic bronchoscopy, superior laryngeal nerve block.

Introduction:
The calcifying epithelial odontogenic tumor, also known as a Pindborg tumor, is an odontogenic tumor first recognized by the Danish pathologist Jens Jørgen Pindborg in 1955. Like other odontogenic neoplasms, it is thought to arise from the epithelial element of the enamel origin[1]. It is a typically benign and slow growing, but invasive neoplasm. Intraosseous tumors are more likely (94%) versus extraosseous tumors (6%). It is more common in the posterior mandible of adults. There may be a painless swelling, and it is often concurrent with an impacted tooth. From anesthesiologist point of view facial distortion obstructs bag and mask ventilation; inadequate mouth opening prevents endotracheal intubation and intraoperative tube positioning is a major concern[6,7].

Case Report:
A 35yrs male patient was posted for surgery for a huge facial tumor of size 12 cm x 8 cm on the right side of the face. The facial anatomy was completely distorted with deviation of mouth, nose and oral structure to the opposite side. During pre-anesthetic checkup the patient was ASA grade-I with Mallampati classification grade-III, normal hematologic profile, and normal renal & hepatic parameters. His blood pressure, heart rate and respiratory status were within normal limits. The facial X-ray revealed significant distortion of the bony mass on the right side of the face.

The Anesthetic plan was to intubate the patient with help of fibro-optic bronchoscopy under superior laryngeal nerve block and sedation. The patient was transferred to the operating room, explained about the procedure, consent taken, iv line secured, sedated with Midazolam 2 mg. Superior laryngeal block was administered with 3 ml of 2% lignocaine on each side. The endoscopic guided intubation with 8.5mm ETT was smooth. The tube was secured on the left side of the face with additional throat pack to prevent trickling of blood into the respiratory passage. Intraoperative pulse, BP, EtCO2, ECG, temperature monitored. The patient was operated successfully over a period of 6hrs, blood loss was replaced with adequate blood products to maintain hemoglobin 8-10 gm. %. Anesthesia was maintained with N2O and oxygen with 1:1 ratio. Extubated after adequate reversal with neostigmine. The patient was shifted to the post-operative recovery room, observed for 6 hrs and then transferred to the ward.

Discussion:
The definition of difficult intubation remains controversial and its reported incidence ranges from...
1.5-20.2%, with an overall incidence of 5.8%. A higher incidence of difficult intubation in ENT/maxillofacial patients has been reported previously.

The calcifying epithelial odontogenic tumor was previously described as an adenoid adamantoblastoma, unusual ameloblastoma and a cystic odontoma[1,5]. Like other odontogenic neoplasms, it is thought to arise from the epithelial element of the enamel origin. On radiographs, it appears as a radiolucency (dark area) and is known for sometimes having small radiopacities (white areas) within it. In those instances, it is described as having a “driven-snow” appearance[5].

Microscopically, there are deposits of amyloid-like material. The underlying nature of the amyloid-material is still unresolved. Clinically it has two types, the central and the peripheral. The central type of the CEOT occurs in individuals ranging in age from 20–60 years. Two-thirds of the lesions are in jaws, more commonly in the molar area with a tendency to occur in the pre-molar areas. It appears clinically to be a slowly enlarging painless mass.

In this particular situation bag and mask ventilation was not possible. Again mouth opening was grossly reduced. We preferred not to administer succinylcholine and intubate with usual laryngoscopy visualization. Because it would have invited use of more force and subsequent oropharyngeal injury. Hence to be on safer side superior laryngeal nerve block was considered to reduce pharyngeal reflex followed by fibro-optic bronchoscopy guided intubation was performed[4].

Conclusion:

Fibro-optic guided endotracheal intubation under superior laryngeal nerve block & IV sedation was safer technique compared to other modes of intubation in presence of huge maxillo facial tumors such as Pindborg tumor.

References.
Introduction:

Imperforate hymen is a very rare congenital malformation of Female genital tract. It is rarely diagnosed before puberty.

Case report: A 12 year old girl presented to labour room on 26.03.2012. With complains of lower abdominal pain for 1 day. She was having periodic, spasmodic pain lower abdomen for last 1yr.

Past history

For the last one year the patient was suffering from periodic lower abdominal pain, which was spasmodic in nature. It subsided with intake of some analgesics.

Menstrual history:

She has not attended her menarche yet.

On examination: Patient was well oriented to time, place and person. Moderate pallor was present. There was no icterus, cyanosis, clubbing or lymphadenopathy present. JVP was normal. Thyroid not enlarged. Her pulse rate was 82/min, blood pressure was 110/72mmHg, temperature 99F and respiratory rate was 22/min. On systemic examination CVS and Respiratory system was normal.

On abdominal examination: A suprapubic mass felt of 14 wk size, tender, cystic in consistency, immobile. On inspection of vulva, imperforate hymen bulge out of vagina. USG report showed hematocolpus with hematometra.

Treatment: Urgent cruciate incision over the hymen and drainage was done under short general anaesthesia. Post operative period was uneventful.

Discussion:

Imperforate hymen is an important cause of cryptomenorrhea. Periodic lower abdominal pain with urinary symptoms is the main presenting symptom. It should be addressed promptly with incision and drainage which relieves the symptom and also prevent further damage of tubes by hematosalping formation.

Conclusion: A infrequently reported case of imperforate hymen with hematocolpus with hematometra was treated with incision and drainage.

References:

Kikuchi-Fujimoto Disease Mimicking TB Adenitis – A Case Report

S. Dash¹, S. Sahu², M.R. Baisalh³

INTRODUCTION: Cervical lymphadenopathy in a young patient in India is most commonly due to tuberculosis. Other causes of cervical lymphadenopathy with fever are lymphoma, metastasis, sarcoidosis, and rarely Kikuchi-Fujimoto disease (KFD). The prevalence of KFD disease is most common in Asians. Physicians should consider this in the differential diagnosis of cervical lymphadenopathy to prevent the unnecessary use of antituberculosis treatment in these patients who respond well to symptomatic treatment.

CASE REPORT: A 16 year female patient presented with complaints of fever, myalgia and headache for 20 days associated with decrease appetite, weakness, pain and swelling on the right side of neck. On examination there were multiple tender matted lymph nodes in right cervical region. Cardiovascular, respiratory, gastrointestinal, musculoskeletal system, oral cavity, and skin revealed no abnormality. The patient had undergone ultrasound of neck showing multiple lymph nodes on right side 10-20mm size with few showing necrosis. FNAC done outside revealed lymphoid cells at all stages along with fibrous histiocytic strands, few epitheloid cells occasionally. Suggested investigations in line of tuberculosis. Mantoux test was negative. ESR was 82mm first hour. The patient was advised CAT-1 antitubercular therapy. She continued to have fever and pain in the neck. She came to seek second opinion as she was not improving with antitubercular treatment. Blood parameters including complete blood count and routine biochemistry were normal. Chest x-ray revealed no abnormality. A decision for excision biopsy was taken. During biopsy the surgeon also thought the lymph nodes were matted. Histopathology of lymph node showed features of distortion of lymph node architecture with areas of histiocytic necrosis and infiltration of inflammatory cells suggestive of KFD (large areas of geographic necrosis with degenerated polymorphs and histiocytes. No evidence of granulomatous reaction or atypia-Necrotizing Lymphadenitis). Antitubercular drugs were stopped and corticosteroids were started along with NSAIDs in view of the intolerable symptoms. She was discharged with tapering dose of prednisolone and NSAID. She is afebrile with no complaints after starting of steroids during her follow up after one month.

DISCUSSION: Kikuchi Fujimoto disease was first described by Kikuchi and Fujimoto independently in 1972 [1,2]. The disease has been reported all over the world but the more number of cases have been found among asians especially among the Japanese population. Though it can be found in any age group but most of the cases are below 30 years with a female preponderance [2]. There is no definite etiology for this disease, however it is thought to be either due to infection including both viral like Epsteinbarr virus, herpes viruses, cytomegalovirus, parovirus, paramyxovirus, parainfluenza virus, rubella, hepatitis B virus, Human Immunodeficiency Virus (HIV), human T-lymphotropic virus type 1, Dengue virus [3,4] and non viral causes like yersenia, brucella, bartonella. Non infectious causes like SLE and lymphoma are also found to be associated with KFD [5]. The disease mainly present as flu like symptoms with myalgia, headache, fever and tender cervical lymphadenopathy. The differential diagnosis of lymph node enlargement in patients with the clinical signs of KFD includes mainly tuberculosis and other infectious types of lymphadenitis, and malignant lymphoma. Fine-needle aspiration (FNAC) are generally not sensitive enough to provide a reliable diagnosis. The diagnosis of KFD is confirmed by lymph node biopsy, when histopathology reveals necrotizing lymphadenitis restricted to the cortical and paracortical areas, with partial or complete loss of follicular architecture, areas of apoptotic necrosis.
with abundant karyorrhectic debris and numerous histiocytes. Neutrophils and eosinophils are characteristically absent. Diagnosis of KFD is largely based on morphologic evaluation, immunohistochemistry analysis being commonly used to rule out malignant lymphoma. KFD is a self-limiting condition that rarely requires specific treatment in most cases. Management is, therefore, based on supportive therapy, such as analgesia and anti-inflammatory medication. In patients with severe symptoms and affection of other organs, corticosteroids improve the patient’s condition rapidly. Recurrence of the disease among treated cases is 3-4%. Follow-up of these patients is essential because some of them develop SLE or lymphoma in a later stage.

Tuberculous lymphadenitis is very common in India. Multiple lymph nodes may appear as matted even though it may not be due to tuberculosis as in our case. FNAC showing necrosis is not always due to tuberculosis. It can be found in KFD and lymphomas. Therefore an excision lymph node biopsy should be done to confirm the diagnosis if there is any atypical presentation (tender lymphadenopathy as in our case) or no improvement with antitubercular treatment.

CONCLUSION: Though the most common cause of cervical lymphadenopathy in India is tuberculosis but patients not responding to antitubercular treatment, having persistent tender

HP of lymph node showing necrosis with histiocytic infiltration but no neutrophils

HP of the lymph node (Total Distortion of lymph node architecture, No differentiation between cortex and medula)

lymphadenopathy and persistence of symptoms, a lymph node biopsy should be done so that KFD is not missed and unnecessary antitubercular treatment is avoided. All patients of KFD should be closely followed up because of the chance of developing SLE or lymphoma in a later stage.

Bibliography

Diagnosis of tuberculosis during oncological practice

P.K. Das¹, D.R. Samant², S.K. Samantra³, G. Panda⁴, P. Devi⁵

Introduction

During our routine oncological practice we encounter many patients of tuberculosis of various sites giving a false picture of malignancy and hence come to us being referred by general practiceners or clinicians from civil hospitals. They also confuse us during the process of clinical examination and investigation. Sometimes they are associated with other neoplastic entities. Here are few case reports which are described and discussed below.

Various clinical cases

Case #1

Forty years Hindu male presented to surgical oncology OPD with a clinical finding of multiple neck nodal masses on right side in level 3 and 4, mobile, but matted nodal mass right axilla with mild induration and multiple discharging sinuses. There was also history of night sweat and low grade fever. FNAC of the neck nodal mass was metastatic poorly differentiated adenocarcinoma for which he had come to us to search for any primary. Oral cavity examination, triple endoscopy and the Chest CT scan were all normal. Upper GI Endoscopy did not reveal any abnormality. An excisional full neck node biopsy was done and the HPE report was Tuberculous adenopathy.

Hence it should be always borne in mind that FNAC alone might mislead a clinician and direct towards many unnecessary investigations, and in such case a simple investigation like excision biopsy of one of the mobile nodes under local anesthesia in any minor operation theatre can pin point the diagnosis. This patient was subjected to anti tuberculoses drug therapy and all the lesions vanished within 3 months period.

Case #2

Another male aged about 50 years presented to our surgical oncology department with complains of swelling of the 4th toe of left leg for last one year which was gradually increasing in size. He was earlier seen at a District Head quarter Hospital and an X-ray of the part showed necrosis of the phalangeal bone. So he was referred to orthopaedic department of civil hospital thinking to be a case of osteomelities. There was no signs of inflammation nor any sinus formation if at all with this much amount of...
sequestrum, so it was not fitting to the diagnosis of osteomyelitis, hence he was referred to our department of surgical oncology to rule out bone malignancy. We examined the case clinico-radiologically and took a core needle biopsy from the swollen digit. The histological diagnosis was tuberculous osteomyelitis of the digit.

So again we want to emphasise here that a core biopsy in such case becomes very much helpful and changes the whole plan of treatment and more importantly the outcome from any other potentially non-curable disease to a potentially curable entity.

Case #3

Mr KS, 55 HM presented to us with bipedal edema, gross anaemia and features of gastric outlet obstruction. Upper GI endoscopy biopsy was infiltrative carcinoma of stomach, but the institutional review of the slide could not get histological evidence of malignancy and hence a repeat endoscopic biopsy was done which asked for further IHC study to exclude the possibility of lymphoma. As the outlet obstruction was distressing the patient very much, patient was taken for surgery as soon as the anaemia and hypoproteinaemia were corrected. On laparotomy, the antrum wall was found to be thickened with dilated proximal stomach due to gastric outlet obstruction. Multiple perigastric nodes were found to be enlarged. A D2 Radical Lower partial gastrectomy operation was performed on the basis of laparotomic finding and previous biopsy reports. There was a histological surprise on the final biopsy report. The gastric lesion was nonspecific inflammation and one out of 21 lymph nodes showed features of Tuberculosis. The patient was referred to TB chest department for anti tuberculous treatment.

In this case, had there been no gastric outlet obstruction, the diagnosis would have become difficult as the primary histology of thickened antrum was only nonspecific inflammation and there would not have any scope of lymph nodal biopsy of the only lymph node out of 21 peri gastric ones.

Case #4

A 35 years aged young lady presented with multiple lymph nodal swelling left side of neck and a parietal firm soft tissue mass in right lower abdomen which was not extending to any intra abdominal structure, size about 10x12 cm.

Trucut biopsy of the neck nodal mass yielded a diagnosis of Tuberculosis and the trucut biopsy of the parietal mass was fibromatosis. Clinically we thought both could be inter related in histology. Wide local excision was performed for the soft tissue mass after a month of starting antituberculr treatment.
of the patients had undergone nondiagnostic biopsy procedures before referral, none had had skin tests for tuberculosis. Underlying conditions were found in eight patients, and alcoholism was the most common. Laboratory abnormalities were rare with the exception of increased platelet counts, which were found in eight patients. The most common form of tuberculosis was pulmonary (14 patients) followed by lymphadenitis (nine patients). Tuberculosis remains an elusive disease even in countries with advanced medical technology. In some cases, its presentation may suggest the presence of malignancy.

2. **Tuberculosis in the head and neck — a forgotten differential diagnosis**

**Review Article**

Clinical Radiology, Volume 65, Issue 1, January 2010, Pages 73-81


The aim of the present review is to illustrate the pathogenesis and imaging findings of tuberculosis in specific head and neck regions to avoid pitfalls in diagnosis. It is imperative to be aware of, and provide an early diagnosis for, extra-pulmonary tubercular lesions in the head and neck. A high index of suspicion combined with an appropriate clinical setting serves as an important background to diagnose tubercular lesions in the head and neck region and differentiate them from malignancy and other disease entities. Early diagnosis and treatment can prevent irreversible and debilitating complications and mortality from disseminated tuberculosis.

**Message**

All malignant looking lesions are not always malignant. Hence a preoperative histological diagnosis should always be done before proceeding for definitive treatment. Trucut biopsy is a simplest and OPD procedure which can retrieve a good amount of core tissue to help the histopathologist to arrive at a diagnosis. Sometimes Immunohistochemistry study is required to give a sub histology diagnosis. We see not uncommonly the diagnosis of isolated tuberculosis mimicking malignancy. Sometimes Tuberculosis is associated with malignant pathology. Rarely a laparotomy is needed to get the diagnosis in difficult cases. These facts must be kept in the mind of all oncologists during their practices.
Abstract:

Wilson disease is a rare, inherited disorder of copper metabolism. It usually presents with neurological or hepatic manifestations. Asymptomatic liver function test (LFT) abnormality or characteristic neuroimaging findings are commonly seen in patients with pure neurological involvement. Pyramidal tract involvement is an uncommon neurological feature of Wilson disease. We describe a 14 years old male, presented with tremor and pyramidal tract signs, finally diagnosed as Wilson disease but without any abnormalities in either MRI of brain or liver function test. Concomitant expression of such multiple atypical features of Wilson disease in a patient is very rare.

Key words— Wilson disease, Pyramidal tract sign, Normal neuroimaging, Normal LFT.

Introduction:

Wilson disease (WD) is a rare autosomal recessive disorder, characterized by abnormal copper metabolism, which leads to excess copper deposition in various organs chiefly liver and brain. [1] ATP7B, the gene responsible for Wilson disease codes for a copper-transporting ATPase expressed primarily in the liver.[2] The disease usually presents in the first two decades of life with hepatic or neuropsychiatric manifestations. Tremor, dysarthria, dystonia are the predominant neurological features. Pyramidal tract involvement is not common in Wilson disease. Importantly most patients of neurological manifestations have hepatic involvement though asymptomatic. [3]

Slit lamp documentation of corneal Kayser-Fleischer ring, low serum ceruloplasmin, increased 24 hr urinary copper excretion, and increased hepatic copper content in liver biopsy helps in diagnosis of WD. Characteristic features are noted in MRI of brain, especially in patients with neurological symptoms. Direct mutation analysis can be difficult as most patients are compound heterozygotes with a different mutation on each allele. Not all mutations of ATP7B have been established as causing disease. [4]

Our patient presented with gradually progressive coarse tremor, upper motor neuron type of weakness without any feature of hepatic involvement. Wilson disease was diagnosed by ophthalmologic examination, estimation of serum ceruloplasmin and 24 hr urinary copper excretion but MRI of brain and the liver function test were normal.

Case Report

A 14 years male admitted with gradually progressive tremor of all four limbs for last six months. There were difficulties in getting up from sitting posture and walking due to weakness of lower limb muscles. He did not complete schooling. His birth history was uneventful. No history of bladder or bowel disturbances, seizure, jaundices or ascites were present. There was no family history of similar disease. All his elder siblings are having normal health and schooling. General examination was normal except for mild pallor. Neurologic examination revealed borderline impaired intelligence quotient (78 by Stanford Binet scale). Plantar response was extensor on right side and equivocal on left side. Other superficial reflexes were preserved. Tone was increased in all four limbs. Muscle power was decreased in hip flexors and in hamstring groups (right -4/5, left 4/5). Deep tendon reflexes were exaggerated bilaterally, more on right side. No sensory or posterior column dysfunction could be documented. The tremor was coarse in nature (6-8 cycles/second), involving both proximal and distal limbs, exaggerated upon exertion, relieved during rest and sleeping. Other systems were normal.
Laboratory investigations revealed mild anemia (Hb—10.7gm/dl) of microcytic, hypo chromic type. No acanthocytes could be documented in peripheral blood smear. All other parameters including, corrected reticulocyte count, serum LDH, electrolytes and renal function test were normal. Liver function test was normal with normal prothrombin time—13.5 sec. (control—13.1 seconds). Slit lamp examination of eye revealed Kayser-Fleischer ring (Figure 1). Ultrasonography of abdomen and spleeno-portal axis Doppler study was normal. MRI of brain including T2 Flair (Figure 2a), diffusion weighted images (Figure 2b)] and MRI of cervical spine were normal. Serum ceruloplasmin level and 24 hour urinary copper excretion were 15.5 U/L and 420 microgram respectively.

Based on these results, the diagnosis of Wilson disease was confirmed. No clinical or laboratory evidence of hepatic involvement could be documented. He was advised low copper diet with D-penicillamine (1gm/day in divided doses) and pyridoxine. During his follow-up visit there was good improvement of muscle power with mild reduction of tremor. Later on D-penicillamine was substituted with Zinc acetate as a maintenance therapy.

Discussion:

Neurological manifestations in WD usually start in the second or third decade but can present in childhood. Dysarthria, gait disturbance, dystonia, rigidity and tremor are the common findings where as chorea and athetosis are less frequent. As in our patient, subtle findings, like deterioration in school work may be found in pediatric age group. Psychiatric symptoms be present rarely. According to standard textbook pyramidal tract involvement is absent in WD. Some literature showed that pyramidal tract involvement in WD patients may ranges from 3% to 16%. Involvement of pyramidal tract may be subclinical. Our patient had clinically evident pyramidal tract involvement which is uncommon in Wilson disease.

MRI of brain offers valuable information for diagnosis of Wilson disease especially when neurological features are present. There may be T1 hyper intensity in the globus pallidus, putamen, and mesencephalon in patients with hepatic involvement or T2 hyper intensity in the striatum among patients with neurologic symptoms. It is rare to get a normal MRI of brain in neurologically symptomatic patient of WD. Most of the previous studies showed abnormal brain MRI findings in almost all patients of Wilson disease with neurological manifestations. However studies among paediatric population showed that, up to 23.5% neurologically symptomatic WD patients had normal initial MRI of brain, but the mean age of the patients with normal MRI was low (8.5 years) compared to patients with abnormal MRI findings (10.9 years and 12.6 years for patients with abnormal T1 and T2 signal respectively). Our 14 years old patient had only neurological features but the cranial MRI was normal.

Spectrum of hepatic involvement in WD ranges from subclinical biochemical abnormalities to acute liver failure. Signs of chronic liver disease or cirrhosis are also seen. Clinical evidence of liver disease usually precedes neurological symptoms and most of the neurologically symptomatic patients have some degree of liver disease at presentation. Even in asymptomatic patients there are abnormalities in serum aminotransferase level, except at a very early age. Despite the presence of extensive neurological involvement there was no evidence of liver dysfunction in our patient, either clinically or biochemically. Sonographic hepatic morphology and spleeno-portal axis Doppler study were also normal. The cause of selective involvement of central nervous system with sparing of liver could not be explained in our patient.

In this patient, the final diagnosis was not a challenging or surprising one, as Wilson disease is an important diagnostic consideration in any patient with early onset movement disorder. This case is exceptional due to simultaneous presence of multiple unusual features of WD. There is no previous case report of WD with such combined atypical findings. Such atypical spectrums of WD should be kept in mind while dealing with this potentially treatable disease.

References:


Figure 1: Slit lamp examination of eye showing Kayser-Fleischer ring in cornea.

Figure 2a and 2b: Normal MRI of brain at the level of basal ganglia. Axial T2 flair image (2a) and diffusion weighted image (2b).
Tubercular Arthritis Masquerading as Bony Crisis in a Child with Sickle Cell Anemia

P.C. Panda¹, N.R. Mishra², S. Panda³

Introduction:

The incidence and pattern of true arthritis in sickle cell disease is largely unknown. Well-established causes of arthritis include joint damage associated with avascular necrosis of the femoral head¹-² and gout secondary to hyperuricaemia³-⁵. Less common causes include infective arthritis⁶-⁹, migratory polyarthritis¹⁰,¹¹, and systemic lupus erythematosus¹²-¹⁴, least one being the tubercular arthritis¹⁵ although it is unclear whether these are causally linked or occur coincidentally with sickle cell disease. Tubercular arthritis in the setting of sickle cell disease is extremely rare, exact prevalence is unknown¹⁶.

Bone involvement is the commonest clinical manifestation of sickle cell anaemia. Bone is selected based on vascularity and marrow activity. Osteomyelitis is another way in which bones are affected in this disorder. Joints are less commonly affected as a sickle cell phenomenon; it is the peri-articular structures that are involved usually masquerading as arthritis. Occasionally bacterial arthritis presents as a painful red hot joint. The chronic arthropathies in sickle cell anaemia are rare in the form of avascular necrosis¹⁷.

It is usual in most instances that any musculoskeletal problem in a patient of sickle cell anaemia is ascribed as sickle crisis and managed accordingly. The original condition is missed too often leading to delayed diagnosis, wrong management, additional morbidities and sequelae. Common orthopedics conditions in children like tenosynovitis, green stick fracture, septic arthritis, juvenile idiopathic arthritis, acute rheumatic arthritis, reactive arthritis and tubercular arthritis are not less prevalent in children with sickle cell anaemia.¹⁸

Here is a rare case report of tubercular arthritis in a child with sickle cell anemia.

A four and half years old girl child(Fig-1), known case of sickle cell anemia presented with low grade fever and pain & swelling of the left knee and limping for one and half month duration. There was no history of trauma, night cry, chills and rigor, rash, any other joint involvement or morning stiffness. There was no history of contact with tuberculosis; she had been immunized for age.

The child had received oral and parenteral analgesics, antibiotics and skin traction and managed as a case of sickle cell bony crisis without any improvement for which she was referred.

Clinical examination revealed the child to be non-toxic with axillary temperature of 100.4°F, stable vitals, some pallor, hemolytic facies, local swelling and tenderness over the left knee joint, mild effusion and restricted flexion and extension movement. There was

(Fig-2)TB of Left Knee (Decreased Bone Density &) Compared to Normal Right Knee

¹Associate Professor, ²SR, Paediatrics
³Associate Professor, Community Medicine
VSS Medical College, Burla, Sambalpur, Orissa-768017
Contact : 9861038381, Email-drprakashpanda@yahoo.co.in
Submitted on : 05.02.2014 Accepted on : 05.02.2014
© OMJ 2014
no pulmonary signs or peripheral adenopathy. Other systemic examinations were normal. The girl was underweight (wt/age < 3rd percentile, WHO) and stunted (ht/age < 3rd percentile, WHO). There was 3 cm firm non-tender hepatomegaly and spleen was firm with 4cm enlargement.

Routine hemogram was normal except for Hb of 7.6 gm/dl. Montoux test induration was 12mm at 72hr. X-ray of left knee (Fig-2) reflected decreased juxta-articular bone density and widened joint space. USG of left knee joint demonstrated synovitis with effusion. Analysis of the joint aspirate revealed a straw fluid with 3.2gm/dl protein, 68gm/dl glucose, 400 cells/cc mostly Lymphocytes. TB-PCR was positive for *Mycobacterium tuberculosis*. The patient was treated with RHZE in the intensive phase but lost to follow up after a month.

**Discussion:**

TB arthritis most commonly manifests as a monoarthritis of weight-bearing joints in the hip or the knee. Oligo or polyarticular presentation is not rare and may cause diagnostic confusion with inflammatory arthritis. Despite high incidence in developing countries, its incidence in setting of Sickle Cell anemia is not so uncommon for which the diagnosis of joint and bone TB is often delayed. A high degree of sensitivity to the differential diagnosis would prevent delays, permitting prompt institution of anti-TB therapy and preventing irreversible joint damage. Despite advances, confirmation of diagnosis still relies on lengthy microbiological techniques or invasive biopsy.

**References:**

A Case of Hansen’s Disease with ENL Presenting as PUO
S.K. Mohanty¹, J.K. Panda²

A 52 year old man, a driver by profession, a known alcoholic presented with one-year history of intermittent fever, weight loss and generalized erythematous raised lesions mainly over extremities, face and front of the chest.

On physical examination there was earlobe infiltration, madarosis (loss of hair over the lateral eyebrows), papular and nodular over extremities, face and front of the chest. The ulnar and posterior tibial nerves were thickened.

The skin smear for AFB revealed a 6+ bacilli load.

ENL is a Type-2 Lepra reaction seen in BL and LL Leprosy patients which appear in crops associated with fever and joint pains, which presented as a case of PUO in this patient.
Arthritis in Ayurveda

A. Das

Sushruta is the originator of the famous Ayurveda sashtra. According to him, human body is subjected to three doshas i.e. Vata, Pitta and Kapha. Any imbalance of these three causes disease in body.

According to Ayurveda, most pains are caused by the aggravation of Vata (air) dosha. Arthritis is a condition caused by accumulation of Ama and aggravation of vata. Ama is a toxic byproduct of improper digestion. The Ama while being circulated in whole body if gets collected in the weaker sites like joints and at the same time if there is aggravation of Vata, this results as a disease called Amavata meaning arthritis. This is more common in patients having problems of colon.

Amavata

The synonym for Amavat is Rheumatoid arthritis which affects multiple joints at different sites. When Ama or the toxic materials of body carried by vayu travels in body and gets accumulated in joints which is the seat of Kapha, pain and swelling of joints are the main features. If pitta also gets aggravated it causes burning sensation around the joins.

Clinical Features

Body pain, lack of taste, thirst, general weakness, feeling of heaviness, fever, morning stiffness of joints, pain and swelling of affected parts, constipation and indigestion are the main features.

Remedial Principles

1. Help to digest Amla
2. To reduce Vata
3. Aim to relieve pain and inflammation.

Management

1. Dietary regimen:

   Desirable food- old rice, butter milk, wet ginger, garlic, wheat, horse grain and bitter gourd, fruits salads, green vegetables, soups and juices.

   Avoid - Diary products, sweets, oily junk foods, salty and sour foods, Jaggery black gram, fish, cold drinks and ice-creams, cabbage, cauli flower potato, tea coffee, Alcohol, chocolate hot and spicy food.

2. Life style Modification:

   Avoid cold breeze, use of air conditioner and cold bath.

   Gentle walking after food, habit of drinking water half an hour after food.

   Yoga and Pranayam to relieve stress, fear, mental tension, grief and obesity

Approach to treatment:

   a) prevent blockage if circulatory channel of toxins to joints.
   b) To strengthen digestion— to create nutritional plasma which is to assimilate
   c) Improve lubrication of joints
   d) to balance and stabilize Vata

3. Drug Therapy:

   Use of Gugglu, Aswagandha, Haritaki, Rasuna Sunthi, Pippli and Trivrrrut, administration of castor oil.

4. Pancha Karma treatment - for elimination of toxins (Ama)

   a) Snehana- Treatment of affected parts
   b) Swedana- Application of steam to parts to reduce inflammation
   c) Virochana- inducing purgation to clean bowels and result in proper absorption and assimilation of food
   d) Vasti Karma- Herbal enema induction

The above four steps of treatment takes 2 to 4 weeks for complete relief.

Preventive Measures:

1. Loosing excessive weight.
2. avoiding loose motions
3. light exercise like swimming and cycling
4. Daily yogasanas-meant for only arthritis (mentioned below)
5. Avoid long standing activities.
6. Eating raw root vegetables
7. Intake of rich calcium diet like milk, curd. green leafy vegetables and millets
Daily activities to limit strain on knee joints:
1. Avoid long standing for more than 10 minutes, climbing steps, bending and squatting.
2. Wearing good shoes - flat hill and soft surface.
3. Exercises for cardiovascular fitness and to increase body bone density.

Asana - Specific asanas for flexible joints
a) Half and full butterfly - for hip and knee joints
b) Patellar exercises — cycling like movements of knees for easy contraction and relaxation.
c) Rotational movements of knees by semi squatting position—repeat 5 to 7 times.
d) Gomukhasana, Makarasana, Markatasana, and Batayanasa.

Pranayams:
a) Bhastrika—for 5 minutes daily.
b) Kapalvati—from 10 to 15 minutes.
c) Anuloma Bilom—for 15 minutes.

Investigation needed:
a) Physical examination
b) X-ray
c) MRI
d) Arthroscopy

Home remedy of Amavata:
1. 100 gram Methi + 100 gram Turmeric + 100 gram Sunthi + 50 gram Aswagandha — dry all under sun. Make powder 1 tsp of this powder to be taken in a cup of warm water in morning and evening in empty stomach.
2. 5 Gangasiali leaves are to be made as paste. Boil in water, drink without straining when cold. Results seen after 2 to 3 months.

Sandhivata:
Is otherwise known as Osteoarthritis. It causes Rukshyata (dryness) resulting in increased friction and destruction of Asthi dhatu of the big joints.

Clinical features:
1. Sandhi Vedana — pain in joints
2. Vedana yukta chesta—painful movement
3. Sandhi sphuran—crepitations in joints
4. Sandhi stabdhata—inactiveness of joints

Management:
1. Drugs required for:
a) Shothagna—means anti-inflammatory
b) Dhatu vardhak—growth promotion of bone tissue
c) Vatahar—pacifying vata dosha
d) Rasayana—Adopto genic
e) Vedana Shanka—Analgesic.

Myrrha Gugglu, five bitter plants and ghee has the benefit of relieving osteoarthritic pain and swelling of a person. This gives a proven relief for acute cases of 3 to 5 years old in chronic cases therapy needs repetition at 3 months intervals.

Jogaraj Guggul, Simhanad Guggul, Vata gajankusa, Rasaragraj and Agnitundi.
Panchakola (Chabya, Chitrak, Sunthi, Pippali, Pippalimula) boiled in water and taken daily as kwath.

2. Oils for gentle massage:
a) Maha Narayana Taila
b) Dhanvantari Taila
c) Hingu Thriguna Taila
d) Castor Oil
3. Use of Rasayana Acts as antioxidants and Phytoestrogens
4. Amlaki—Drugs to maintain general health of a person.
5. Swarna bhasma, prabalpisti, mahabatvidwesini, bruhatata vata chintamani, punarnava mandura

Useful tips for arthritis:
1. Drink a big glass of warm water with one lemon juice and sugar twice in morning and evening.
2. Eat methi dana or Methy leaves daily.
3. Apply Dalchinni paste to inflamed joints.
4. Avoid tension, worry, anxiety, fear and stress.
5. Reduce weight to have minimum pressure on knees.
6. Daily physical exercise.
7. For application in affected area—paste of 1 part of Honey+ 2 parts of lukewarm water + pinch of Cinnamon powder.
8. Daily intake of lime or orange juice.
9. Daily body massage with Mustard oil or Seasume oil to reduce Vata. Regular gentle massage of joints is beneficial.

Home remedy:
1. Pippali + Guda one tula
2. Eranda—Mula, debdaru, bilwa with sunthi to be taken as kwath

Reference:
100 years ago in 1910, Abraham Flexner said “The curse of medical education is the excessive number of medical schools and the situation can improve only as weaker and superfluous schools are extinguished” India is facing a similar situation now like what USA and Canada faced a hundred year back which need for urgent action to treat the malady with effective remedy by promoting quality education.

As per the recent report by the Health Ministry, the current doctor-patient ration in India is around 1:2000, whereas the global ratio is 1:670 and to reach the desired target of at least 1:1000, the country will require an additional 15.5 lakh doctors which is at least equivalent to 50% more doctors. The planning commission also has acknowledged the shortage of health professionals in its approach paper to the 12th plan and their primary focus would be to increase the number of medical colleges, relaxation of norms like teacher-student ratio, land requirement, bed strength, bed occupancy, increase in the age of teaching faculty, increasing the maximum intake capacity at basic graduation level (MBBS) from 150 to 250 and doubling the intake capacity at post graduate (MD/MS) level etc.

The American Medical profession by 1900 were fully aware of the overprotection of physicians in a variety of substandard medical school and by 1904, the American Medical Association had created a permanent counsel of Medical education that surveyed and rated the nations medical schools. By 1910, 166 of the medical schools on America had been reduced to 126 as per the recommendation of Flexner report.

The present Indian health care scenario is hopeless both quantitative and qualitatively even in comparison to the neighboring country like Srilanka, leave alone USA, Canada or European countries. Even though there are more than 330 medical colleges at present in India, most of which are in private sector with 40 thousand MBBS seats 20 thousand’s PG s seats approximately but most of these colleges are without any adequate infrastructure including faculty etc which runs on commercial basis without any academic credentiality. The net result is the production of doctors whose knowledge of basic medical sciences is scanty who are not capable of treating even common diseases, like the description of French philosopher Voltaire (1694-1779) that “doctors as men who prescribe medicines of which they know little to cure diseases of which they know less, in human beings of whom they know nothing”. Over and above, the central government plans short term medical courses to produce half-baked doctors equivalent to quacks for rural poor.

When China faced a shortage of medical professionals, they produced a huge number of bare foot doctors without imparting proper training which resulted in Chaos. There is neither enough primary nor secondary health centers in India nor they are distributed evenly though out the length and breadth of the country, neither the health centers and well equipped nor are they manned by adequately trained staff, where as China has come up with a plan of 124 billion dollar to correct the existing Chaos in next three years by building 29 thousand new local medical centers, 2,000 new national level hospitals and additional training for 1.37 million village level with 1.6 lakhs community level doctors including caps on the drug prices. But the Government of India has withdrawn from the service sector which has left the health care sector high and dry, leaving to corporate sectors and private enterprises, resulting to the present chaotic scenario, instead of correcting the anomaly.

What Abraham Flexner, a simple high school principal who had never visited a medical school before he began his investigation, concerned by the lack of
quality in American Medical education 100 years back, should be followed by the medical council of India and the Health Ministry at least now without behaving like an ostrich any more. Flexner compared each medical school to Johns Hopkins as an ideal institution, the Indian equivalent of AIIMS at present and examined the relationship of the medical school to a teaching hospital, the integration of teaching and working facilities into the general organization of fundamental laboratories at the medical school, unifying the medical school faculty and the hospital staff, affording professors the freedom to adopt necessary teaching arrangement, research etc. subject only to concerns for the welfare of patients. Flexner in his famous report in 1910, gave a stinging remark referring to Chicago state and its 14 medical schools that “a disgrace to the state whose laws permit their existence” and was successful in creating a single model of medical education unlike that in India where the standard varies from state to state and college to college also including dual standards on universities and board of examinations. Flexner recommended that the country needs fewer and better doctors, and the way to get them better is to produce fewer. By 1915, the medical schools in USA had been reduced to 96 only and by 1930 there were only 76 schools training the physicians of the whole country, a strong positive impact of the Flexner’s report. In contrast, the number of substandard medical colleges to the Government and private sectors are constantly increasing by leaps and bounds, turning a blind eye to the quality of the medical education. As per a recent report there are about 200 applications to start new medical colleges on 2011 only and maximum of which are from the southern states which already have almost 50% of medical colleges existing in the country. As per another report quoting lok Sabha questions on 2010, Maharastra has the highest number of Medical colleges (41), followed by Karnataka (39), Tamil Nadu (37), Andhra Pradesh (35) and Kerala (23), the small union territory of Pondicherry also have got 10 medical colleges where as Orissa has not started a single medical college in Government sector for more than 50 years, having a population of four crores.

One of the burning example of lopsided doctor / population ratio is in Kerala where there are more than 43 thousand MBBS qualified doctors for population of 3.33 crores having one doctor for 800 people, excluding Ayurvedic, Homeopathic and Unani doctors.; as per one conservative estimate 290 million people are pushed into poverty in our country due to exorbitant medical expenditure. In the pretext of evidence based medicine and defensive medicine there is obnoxious unethical trend slowly gripping the medical profession.

The medical council of India (MCI) should wake up from deep slumber to take appropriate action before it is too late. MCI published “Regulation on graduate Medical education – 1997” which totally absurd now. The National Health policy – 2002 observed that the current curriculum in the graduate / post graduate is outdated and unrelated to contemporary community needs. The MCI proposed a new set of regulations and guide lines in 2003 which was not approved. Again in 2007, another set of guide line proposed by MCI has not seen the light of the day. Recently in 2011, MCI has proposed major charges in MBBS curriculum for implementation in 2012 after approval by ministry of Health and family welfare which is not only contentious but also contradictory to earlier guidelines.

Having highlighted the various maladies spoiling the Medical education and health care, there are some simple remedies suggested as given below which will definitely bring a substantial change in the present chaotic situation prevailing in our country if implemented whole heartedly.

1. Derecognition of substandard Medical colleges and subsequent closure.
2. Strict implementation of recommendation by World Federation of Medical Education (WFME) which has evolved international standards for quality improvement in basic medical education.
3. Discard discipline based curriculum adopt integrated core curriculum.
4. Introduction OF HUMANITIES SUBJECT AS ELECTIVES IN MBBS CURRICULUM FOR AFFECTIVE DOMAIN EDUCATION.
5. Introduction of National Eligibility cum entrance test.
6. Termination of Board of Governors and revival of MCI having doctors with academic credential and integrity.
7. Instead of reducing the preclinical period if should extended to two years and clinical training should be for three years.

8. Recertification and re-registration of the degree after earning required amount of credit hours by attending accredited CME, workshops, conferences etc.

9. Introduction of National Health Service (NHS) as in U.K where health care is open to every body, free of cost with contribution to national insurance.

10. Implementation of stringent law for eradication of Quackery.

11. Scraping introduction of BRHC (Bachelor of Rural Health Care) course.

12. Increasing the health budget from less than one percent at present to 5% of GDP at least in the 12th five year plan.

13. Paying better salary, providing basic facilities like housing and children’s education etc to all the health professionals working in remote and rural areas.


15. Setting time bound target to achieve quality health care us per the millennium Development goals with a deadline of 2015 or universal health care by 2020.

References


Subscription information

Orissa Medical Journal is published bi-annually and circulated amongst members. Price of each issue is ₹ 1,000/- (One Thousand only). The annual subscription is ₹ 1,500/- (One Thousand and Five Hundred only). The journal is despatched within India by surface mail.

Copyright and Photocopying

No part of this publication may be reproduced, or transmitted in any form or by any means, electronic or mechanical, including photocopy without written permission from the Hon. Editor.

Edited, Printed & Published by

Dr. Jayanta K. Panda
for the Indian Medical Association
Odisha State Branch
IMA House, Ranihat, Cuttack-753007, Orissa
Ph : 0671-2413060, 2121125
Email : imaorissa@gmail.com
Website : www.imaodisha.com

The Editor disclaims any responsibility or liability for statements made and opinion expressed by authors or claims made by advertisers.

Adverrtorial enquiry

Dr. Jayanta K. Panda, Hon Editor, OMJ
SCB Medical College
IMA House, Ranihat, Cuttack-753007, Orissa

Printed at
Graphic Art Offset Press, Nuapatna, Cuttack-1.
Manuscript submission : Check List for Contributors

1. Letter of submission.
2. Copyright statement signed by all the authors.
3. One copy of manuscript with copies of illustrations attached to each.
4. Title page.
   - Title of manuscript.
   - Full name(s) and affiliations of author(s); institution(s) and city(ies) from which work originated.
   - Name, Address, Telephone, Fax numbers and e-mail address of corresponding author.
   - Number of pages, number of figures and number of tables.
5. Structured abstract (objectives, methods, results, conclusion) along with title, and key words.
6. Article proper (double spaced on A/4 size paper).
7. Acknowledgements (separate sheet).
8. References (Double spaced, Separate sheets, Vancouver style).
9. Maximum number of references for Original articles - 10, Short articles-5,
   Case reports-5, Documentation-3, Correspondence-3.
10. Each table on separate sheet.
11. Figures/diagrams on separate sheet.
12. Photographs in envelope appropriately marked.
13. Legends on separate sheet.
14. Covering letter signed by all authors confirming that they have read and approved the contents
    and also confirming that the manuscript is not submitted or published elsewhere.
15. Statement regarding Ethics Committee Approval and informed consent from subjects.
16. CD with soft copy of the article.

– Hon Editor.
ORISSA MEDICAL JOURNAL

Product Portfolio

- **Synhance**: Natural Extracts + Vitamins + Minerals + Amino Acids
  - **Synhance Capsules**
  - **Cefosyn CV Tablets**
    - Cefpodoxime 200mg + Potassium Clavulanate 375 mg
  - **Cefosyn 100 DT Tablets**
    - Cefpodoxime 100mg (Dispersible)
  - **Cefosyn 50 Dry Syrup**
    - Cefpodoxime 50mg in each 5ml

- **Syncid**
  - **Rabeprazole Sodium 20mg + Domperidone 30mg(DSRT Release)**
  - **Syncid Tablets**
    - Rabeprazole 20 mg

- **GUTPEP Liquid**
  - Alpha Amylase(Bacterial L-800) 150 mg + Papain 50 mg in each 5ml

- **FITNERV Capsules**
  - Methylcobalamin + Alpha Lipoic Acid + Benfotiamine + Multi Vitamins

- **Dzial Tablets**
  - Calcium Citrate + Vitamin D3 + Magnesium Hydroxide + Zinc

- **Brite UP**
  - Hydroquinone 20mg + Tretinoin 0.025mg + Fluocinolone Acetonide 0.01mg per gm

- **SynAce P Tablets**
  - Aceclofenac 100 mg + Paracetamol 325 mg

- **SynAce-SP Tablets**
  - Aceclofenac 100 mg + Paracetamol 325 mg + Beraprost Sodium 10 mg

- **Synmopt LC Tablets**
  - Levocetirizine HCL 5mg + Montelukast 10mg

- **Synflu Tablets**
  - Cetirizine 5mg + Phenylephrine 10 mg + Paracetamol 325 mg

- **IriKof**
  - Cough, Cold & Allergic Formula
    - Levocetirizine 5 mg + Phenylephrine 5 mg + Guaiphenesin 50 mg/5ml

- **SYNSUNATE-SP KIT**
  - Amoxiclline 200 mg + (Pycineamine 25 mg + Salbuphosphate 500 mg)

- **Sytrax T	extsuperscript{Z}**
  - Ceftriaxone 1 gm + Tazobactam 125 mg

- **Sytrax T	extsuperscript{Z} plus INJECTIONS**
  - Methylcobalamin + Vitamin B6 + Niacinamide + D-Panthenol

Together we can...
With Best Compliments from:

DTF
MICRO LABS

Sweet Life, Delivered

Melmet 500 1000 SR
PREGATOR
Telrose
Glutowin Forte
Meconerv Plus
Melcovit Gold
Thyrotop
Hypotab
Obitrol 60 120
Diapride 1 2 4
Diapride-M1 Forte
Diapride-M2 Forte
Diapride-M3 Forte
Diapride-M4 Forte
Tripride 1/2 LP
Tripride 1/2
Tripride 1/2 LV
Dibizide-M

For obese individuals with high FBG

Diapride-M1 Forte
Diapride-M2 Forte
Diapride-M3 Forte
Diapride-M4 Forte

Tripride 1/2 LP
Tripride 1/2
Tripride 1/2 LV

Dibizide-M

Gliclazide 5 mg + Metformin 500 mg tablets

Gliclazide 1 mg + Metformin 1000 mg SR tablets

Gliclazide 1 mg + Metformin 1000 mg SR tablets

Gliclazide 2 mg + Metformin 1000 mg SR tablets

Dibizide-M
With Best Compliments from:

FUSION of exceptional Expertise & unmatched
Empathy to protect the most important asset... Life

OUR PORTFOLIO

Amonic

Futri

Razone

Razone

Futan

Merox

CP-Van

Cilasafe

Larcide

Genexglob

FLOHEP

DobuTrust

ZESTOVIT

AlphaDex

Midabet

HEBEXglob

Promistin

AddBactam

Piract

IV DAPT

Daptoyacin 358mg

Fusion Health Care(P) Ltd. 1-1-118,119, Flat no.A-1, Chenoy’s Nooks, S.D Road, Secunderabad - 500 003

Connecting life with Hope

www.fusionhealth.in
With Best Compliments from:

Zuventus Healthcare Ltd

Makers of

**AUGPEN** tab. 625mg/1gm  
(Amoxycillin+Clavulanic Acid)

**BEVON-CD** caps  
(Antioxidants+Multiminerals)

**TROXIP-OD**  
(Troxipide 300mg ER tab)

**VITANOVA-SG/Sachets**  
(Cholecalciferol 6000 IU)

**RABIFAST-XL** caps  
(Rabeprazole 20mg+Levo sulpiride 75mg SR)

**ESLO-Tel 2.5/5 tabs**  
(S-Amlodipene 2.5/5 + Telmisartan 40)

**TIBROLIN** tabs  
(Trypsin 48 mg+ Bromelain 90mg+Rutoside 100mg)

**C-TAX-O 200**  
(Cefixime 200 mg)

**RETUNE - LS tab**  
(Levo sulpiride 25 mg)

**GUTCLEAR-IG/SYR100, 200ml**  
(Lactitol10mg+Isapgula3.5gm/10mgper 15ml)
With Best Compliments from:

In Dizziness / Vertigo
Let your patients make... A Fresh Start
Rx
Stugeron
Cinnarizine 25 mg
Simply effective

For Maintenance Therapy of
Chronic/Recurrent Vertigo of Vascular Origin
Rx
Stugeron forte
Cinnarizine 75 mg
Simply effective...for Life Uninterrupted

In Migraine Prophylaxis
Rx
Sibelim
Flunarizine 5mg/10mg
The First-line Migraine Prophylactic

ULTRACET®
(Tramadol 37.5 mg + Paracetamol 325 mg)
High Performance Pain Relief

ULTRACET® SEMI
(Tramadol 50 mg + Paracetamol 400 mg)
Simple start to effective pain relief

Johnson & Johnson Limited
30, Forjett Street, Mumbai 400 036.
Countries differ, Doctors differ but what they prescribe doesn’t

Asomex®
Chirally Pure (S-)Amlodipine 1.25 / 2.5 / 5 mg
The Chirally Pure... Proven Antihypertensive & Antianginal

Asomex® TM
Sustained 5 mg Amlodipine 12 hour
Controls... Protects... Prevents!

Asomex® OH
Sustained 10 mg Amlodipine 24 hour
The trio for smooth BP control

Continue to add New patients on Asomex... Give them Global experience

In Hypertension & Hypertension with Diabetes

E - Tel®
Telmisartan tablets
Effective Telmisartan

Emcure Pharmaceuticals Ltd.
Sr.No. 255/2, Rajiv Gandhi IT Park, Phase 1, MIDC, Hinjewadi, Pune - 411057 Tel.: 020 39821000 Fax: 020 39821019
www.emcure.co.in www.chiralemcure.com
Where there is HEART
There is a WAY

The Way For...
HEALTHIER & HAPPIER LIFE

Gliorest-MP TABLETS
Olmeprazole 1mg+Metformin HCL (SR) 500mg+Piglitazone 15mg

Gliorest-M1 TABLETS
Olmeprazole 1mg+Metformin HCL (SR) 500mg

Gliorest-M2 TABLETS
Olmeprazole 2mg+Metformin HCL (SR) 500mg

Gliclazide 50mg+Metformin 500mg

Hemplopin TABLETS
Amiodarone 5mg

Hemastin TABLETS
Atorvastatin 10mg / 20mg

METEOL TABLETS
Meprobamate Tartrate 50mg

LopirelD TABLETS
Clpidogrel 75mg

TELMICIDE TABLETS
Telmisartan 20mg / 40mg

TELMIGIDE-H TABLETS
Telmisartan 40mg+Hydrochlorothiazide 12.5mg

OLMECIDE TABLETS
Olmesartan 20mg / 40mg

OLMECIDE-H TABLETS
Olmesartan 20mg+Hydrochlorothiazide 12.5mg

DIA CARVIT CAPSULES
Antioxidants + Lycopene + Vitamins + Multimineral

CROSS PIRAMAL PHARMACEUTICALS
...Advance Medicine with Personal Care...
With Best Compliments from:

USV LIMITED

Glycomet®-GP 1
Metformin Hydrochloride 300 mg SR + Olmesartan 1 mg

Glycomet®-GP 2
Metformin Hydrochloride 300 mg SR + Olmesartan 2 mg

Glycomet®-GP 1 FORTE
Metformin Hydrochloride 1200 mg SR + Olmesartan 1 mg

Glycomet®-GP 2 FORTE
Metformin Hydrochloride 1200 mg SR + Olmesartan 2 mg

Glycomet®-GP 3/850
Metformin Hydrochloride 850 mg + Glimepiride 3 mg

Tazloc®-40/80
Telmisartan 40mg/80mg

Tazloc® H/80
Telmisartan 40mg/80 + Hydrochlorothiazide 12.5mg

Tazloc®-AM 40/80
Telmisartan 40/80mg + Amlopidine 5 mg

Roseday®-F
Rosuvastatin 5/10/ 20mg

Roseday
Rosuvastatin 5/10/ 20mg

Jaira-M 50/500
Vildagliptin + Metformin
50/1000
With Best Compliments from:

GERMAN REMEDIES
PHARMA DIVISION
PROUDLY PRESENTS

HAPPI D
Rabeprazole 20mg+Domperidone SR 30mg

HAPPI L
Rabeprazole 20mg+Levosulpride 75mg

GERBISA
Bisacodyl

HYOCIMAX
Hyoscine ButylBromide 10 mg
PROPOSED CONVENTION CENTRE OF IMA ODISHA STATE BRANCH

IMA needs your co-operation and patronage

Members and Benevolent Doners are invited to be a part of this dream project

For further information please contact:

- State President, Mob: 9437012255
- State Secretary, Mob: 9437066627
- State Finance Secretary, Mob: 9437020333
- State Joint Secretary, Mob: 9437020050
- State Head Quarter, Mob: 8763349498