

JIMSA

**The Official Journal of
International Medical Sciences Academy**

A Multidisciplinary Medical Journal

October - December 2018

Volume - 31

Issue - 4



ISSN 0971 - 071X
www.jimsaonline.com

Program Highlights

- Guest Lectures
- Scientific Sessions – (Oral/ Poster Presentation)
- Plenary Sessions
- PG Quiz
- Panel Discussion
- Cultural Events

Conference Secretariat:

Dr. Ramesh Verma,

**Organizing Secretary & Professor ,
Department of Community Medicine,**

Pt. B. D. Sharma PGIMS, Rohtak, Haryana, India

E-mail: imsaconference2020rohtak@gmail.com

**Phone: (+91) 01262-282471, 282635,
282632, 281303 (Extn: 2597, 2315)**

**Last date for abstract submission -
31st January, 2020.**

For Queries Kindly Contact:

Dr. Gopal Kumar: 9534322318

Dr. Navraj Tiwana:9992473022



8th Dr. R. R. Thukral Midterm IMSA Conference 2020

18th -19th April 2020

Theme : "Affordable Health Care: Challenges and Future Prospects."

**Pt. Bhagwat Dayal Sharma,
Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India**

www.imsamidterm2020.com

JIMSA

*The Journal of International
Medical Sciences Academy*



2018 (October - December)
Volume 31; Issue 4

Board of Trustees

President K. Jagadeesan
Vice President Nadey Hakim
Members
S Padmavathi Ramadas M Pai
Sandip Mukerjee B. Bhaskar Rao
R. K. Thukral

Central Executive committee

M. Ramanathan, Chairman, India Region
RK Thukral, Executive Director
Shibani Mehra, Secretary General
A. Govindan, Member

International Advisors

Sir Roy Calne (England) Allister D Beattie (Glasgow)
H Klinkmann (Germany) Susan Lim (Singapore)
Parag Singhal (England) Gurleen Kaur (USA)
Sonu Gupta (USA)

Editorial Board

Emeritus Editor

PD Gulati (Delhi)

Editor-in-Chief

NP Singh (Delhi)

Associate Editors

SC Tiwari (Delhi)

Section Editors

NS Neki (Amritsar)

KS Anand (Delhi)

Assistant Editors

Anupam Prakash (Delhi)

Sandeep Garg (Delhi)

Members

Sandip Mukerjee (Delhi)

RK Thukral (Delhi)

Kamalesh Chopra (Delhi)

Tarun Gupta (Delhi)

Pravesh Mehra (Delhi)

Vibu Mendiratta (Delhi)

Sandeep Bansal (Delhi)

Anjali Prakash (Delhi)

Editorial Advisors

Agarwal BB (Delhi)

Aggarwal SP (Delhi)

Annil Mahajan (Jammu)

Ashok Grover (Delhi)

Attri AK (Chandigarh)

Bali RK (Delhi)

Bhargava SK (Delhi)

Chandrasekaran M (Chennai)

Chhavi Sawhney (Delhi)

Gupta PS (Delhi)

Harshwardhan (Delhi)

Indra Bahl (Delhi)

Jagadeesan K (Chennai)

Jayachandran S (Chennai)

Jiloha RC (Delhi)

Logani KB (Delhi)

Mohapatra AK (Delhi)

Naresh Tehran (Delhi)

Neeraj Jain (Delhi)

Neeraja Puri (Ferozepur)

Pavan Malhotra (Jammu)

Raghuveer CV (Bangalore)

Rajesh Chawla (Delhi)

Raut DK (Delhi)

Renjen PN (Delhi)

Richa Dewan (Delhi)

Rohini Handa (Delhi)

Shanmugam J (Pondicherry)

Sudhaa Mahajan (Jammu)

Tabish SA (Srinagar)

Trivedi SS (Delhi)

Veena Chaudhary (Delhi)



Manuscript Requirements of JIMSA

All Manuscripts shall be sent to Editor-in-Chief by email attachment as word file for texts and tables; JPEG for figures. Email ID: npseditorjimsa@gmail.com

Type of article	Maximum Word Limit of Text	Maximum Word limit of Abstract	Maximum Number of references	Maximum Number of illustrations
Original articles	3000	500*	40	6
Review article	5000	300	100	6
Case Reports	1200	200	10	3
Letter to editor	500	NA	5	1
Editorial	1200	NA	5	NA
Images in Medicine	20	NA	NA	1
Pictorial Essay	300	NA	3	4
How I do it	1500	200	10	3
Technical Innovations	2000	300	10	3
Basic & Translational Sciences	3000	500*	40	6
Hypothesis	2500	200	30	2
Medical Research	2500	200	20	NA
Medical Education	2500	200	20	NA
Debate	2000+ 2000	200+200	15+15	NA
Poetry	20 lines	NA	NA	NA
Viewpoint	1500			
Drug Profile	1200			
Association News	NA	NA	NA	NA
Medical News	300 each	NA	NA	1
Historical Vignettes	2500	300	20	4
Book Review	800	NA	NA	NA
Grand Rounds	2500	200	15	4
Obituaries	300	NA	NA	1

For detailed Instruction to Authors please see the journal website: www.imsaonline.com

* Abstracts of original report and basic sciences should be structured. Others should be simple text abstract



GENERAL INFORMATION

The Journal

The Journal of International Medical Sciences Academy (JIMSA) [ISSN: Print 0971-071X] is the peer-reviewed official publication of the International Medical Sciences Academy. It is published quarterly in January, April, July and October.

Aims and scope

JIMSA aims to promote interdisciplinary dialogue in the field of medical science. Manuscripts pertinent to health care, medical research, medical education and health policies will be considered for publication in this journal. Articles in various format such as original articles, review articles, case reports, debates, clinical images, letters to editor, hypothesis, technical innovations, 'How I do it', viewpoints and grand rounds. Occasionally poetry related to Medicine, historical vignettes and obituaries of IMSA members as well as prominent scientists will be considered for publication. News items pertinent to IMSA as well as important medical news will also be published. Although Editorials are Editor's prerogative, concisely written thought provoking short essays submitted by readers will be considered under invited editorials.

Instruction to authors

Authors are advised to follow the "Uniform requirement of biomedical manuscripts" recommended by International Committee of Medical Journal Editors (ICMJE). Brief version of manuscript requirement is published in each issue. For detailed instructions readers are requested to consult our **website: www.imsaonline.com**

All submissions should be addressed to the editor-in-chief at **email: npseditorjimsa@gmail.com**

Only soft copies of manuscripts will be accepted. We no longer accept hard copies as a mark of our commitment to "Go Green" initiatives.

Publication Fee

JIMSA do not charge authors any fee for article processing or final publication. However, cost of colour illustrations and reprints are chargeable to authors. (see website for details)

Indexing

JIMSA is indexed with IndMed, Excerpta Medica, Embase, Google Scholar, Bibliographic database and Indian Science Abstracts.

Copyright

Contents of the journal except advertisements are protected under Indian and International copyrights. No part of the journal shall be reproduced or transmitted in any form or by any means including electronic, mechanical, photocopying and microfilm without prior permission from the Editor-in-chief. However, individual researchers, medical students and practicing doctors are permitted to photocopy or print single articles for non-profit activities such as teaching, research

and health education provided the number of copies do not exceed 5.

Disclaimer

Scientific contents of JIMSA represent the observations and opinions of the authors responsible for the work and they do not reflect the official view, policy or recommendation of editors and publisher of JIMSA or IMSA. Neither the editors of JIMSA nor the Office bearers of IMSA endorse the quality, reliability, value or factual correctness of claims made by the manufacturer of products or providers of services advertised in the journal.

Neither the editors and publishers of JIMSA nor the office bearers of IMSA nor anyone else who is associated with production and distribution of the journal JIMSA assumes any direct or indirect responsibility or liability for any injury and/or damage to persons or properties that occur as a result of using information printed in the JIMSA. Neither the editors and nor the publisher of JIMSA represent or warrant that the information published in JIMSA is in every respect accurate, complete, safe or reliable; they shall not responsible for any errors or omissions that occur during production of the journal. Readers are advised and encouraged to independently verify the accuracy and reliability of information published in the journal.

Legal Jurisdiction

All legal disputes shall be restricted to the legal jurisdiction of The High Court of Delhi, India

Online access

JIMSA ad full text of articles published in it can be accessed from the journal's website www.imsaonline.com

Journal Policy

JIMSA subscribes to the ethical standards of medical publishing promulgated by International Committee of Medical Journal Editors (ICMJE) and World Association of Medical Editors (WAME). JIMSA periodically changes its policies in resonance with updates of these organizations. Updated policies of these organizations can be accessed from

WAME: <http://www.wame.org>

ICMJE: <http://www.icmje.org>

Subscriptions

The Journal of International Medical Sciences Academy is dispatched free of cost to all the members of the academy by ordinary post. Providing complete, accurate and updated address for dispatch is the responsibility of the members / subscribers. The journal office shall not be responsible for non-receipt of copies due to transit loss. However, genuine claims of missing issues shall be replaced provided the journal office is notified within 3 months.

JIMSA is also available for sale on annual subscription. Single

issues and back volumes can also be purchased subject to availability

Subscription rate (Inclusive of postage/shipping but exclusive of Goods and Services Taxes)

	Within India	Overseas
Annual Subscription (4 issues)		
Institutions, Libraries	INR 6000	US\$ 200
Individuals	INR 1200	US\$ 40
Purchase of Single Issue*		
Institutions, Libraries	INR 1500	US\$ 50
Individuals	INR 300	US\$ 10
Purchase of back Volumes (4 issues of any one year) †		
Institutions and Libraries	INR 12000	US\$ 400
Individuals	INR 3000	US\$ 80
Online Access of single articles for personal use	Free	Free

* Request for purchase of single issues should be placed 3 months ahead of the due date of publication; lest they will be considered as back volume sale.

† Back volumes will be sold subject to availability of copies.

Advertisements

Within its print and web pages JIMSA offers a wide range of advertising opportunities to pharmaceutical firms and medical equipment manufacturers to promote their products. Institutions may also advertise job vacancy pertinent to doctors. Interested parties may contact the editor-in-chief at npseditorjimsa@gmail.com

Proposed tariff of advertisements in print pages of JIMSA

(FP- full page; MC - Multicolour)

FP, MC Back Cover outside	Rs. 15,000/- per issue
FP, MC Front Cover inside	Rs. 13,000/- per issue
FP, MC Back cover inside	Rs. 11,000/- per issue
FP, MC Inside	Rs. 10,000/- per issue
FP Black & white	Rs. 8,000/- per issue
Half Page Black & White	Rs. 5,000/- per issue

Discount for 4 insertions in a year 10%

Advertisement in Website Rs. 20,000 per year (12 months)

JIMSA reserves the right to reject or refuse any advertisement without assigning any reason. JIMSA shall not publish any advertisement that does not adhere to ethical standards. Advertisements of products considered hazardous to health such as cigarettes, alcoholic beverages, and breast-milk supplements are unacceptable to JIMSA.

Address for Correspondence

All correspondences, enquiries and complaints regarding article submission, advertisements, permission for reproduction, subscriptions, and donations shall be addressed to the

N. P. Singh, Editor-in-chief, JIMSA, 2nd Floor, National Medical Library Building, Ansari Nagar, Ring Road, New Delhi 110029
Tel. : 011 - 26588226, 26589660
Email: npseditorjimsa@gmail.com

All correspondences, enquiries and complaints regarding new membership in IMSA, change of mailing address, notification of missing issues shall be addressed to

The Administrative Officer
World Headquarter Secretariat
International Medical Sciences Academy
2nd floor, National Medical Library Building
Ansari Nagar, Ring Road,
New Delhi -110 029, INDIA
Telephone:(+91-11) 2658 9660.
Tele Fax: (+91-11) 2658 8226.
Email: imsawhq07@gmail.com

Published by

International Medical Sciences Academy
Second Floor, National Medical Library Building,
Ring Road, Ansari Nagar, New Delhi 110029, India

Printed by

AAR Graphics, New Delhi
Phone: 9811614660, 8178215413
Email: aargraphics@rediffmail.com
aargraphics@gmail.com

JIMSA is Indexed with the following agencies:

IndMED-Database

Indian S & T Journals in International Indexing and Abstracting

640 Journal of International Medical Sciences Academy
ISSN 0971-071X Year 1987+

Coverage in
I & A Service - Scopus & Embase

NLM ID: 9425946 (Serial), Me SH: Clinical Medicine;

Notes: Description based on Vol 2 No 3 (July-Sept 1989);
Other ID: (DNLM) SR0069157 (s).

Association News

Dear Colleagues,

International Medical Sciences Academy (IMSA) is a global organization established as a registered society on 28th March 1981 with world headquarters at New Delhi. It is the only international body which encompasses all disciplines of medicine. It has regions in America, Australia, Europe, Africa, rest of Asia and India. There are 28 chapters world over. IMSA is run by Board of Trustees apart from other executive committees. IMSA is an associate member of Council for International Organizations of Medical Sciences (CIOMS). It has about 2850 Fellows & Members world over and the membership is expanding. Many Nobel Laureates are its fellows.

The main objectives of IMSA is to bring together national and international medical scientists, medical educationists, medical and public health administrators and research workers in medical and health sciences on a worldwide basis for advancement of health of all the people in the world. The academy also arranges courses, training programs, CME programs and Rural CME programs. IMSA publishes quarterly journal, JIMSA in which original articles, updates, symposia, special issues on topics of current interest are published.

Our Annual Conference - IMSACON 2020 will be held at Terna Auditorium, Terna Medical College, Hospital and Research Centre, Nerul (W), Navi Mumbai, Maharashtra, India on November 6 & 7, 2020. All are invited to be a part of this academic celebration.

Though IMSA has been in service of medical profession and has been encouraging development of medical sciences by bringing information technology into the profession thus improving the health of nations, yet we do not have our own building to work more effectively. Our organization is committed to the medical profession for promoting Continuing Medical Education and also holds educational programmes on topics of National and public health importance. We need to conduct more seminars, organize lectures by National and International experts and hold regular workshops and group discussions. For arranging such activities we are badly in need of our own building with adequate infrastructure and facilities like an Auditorium, projection room, library, committee rooms for interactive sessions etc. So far we have been operating from small rented space which can hardly accommodate our office.

Friends, we have been fortunate to get a piece of land about 500 sq.mtrs allotted to us by the Lt. Governor of Delhi for developing the IMSA World Head Quarters at Delhi. I am approaching all Fellows and Members to donate at least Rs. 5000/- each to meet the cost of the land as well as for construction of our own building. The donations are exempted from tax under 80G; the cheque may please be made in the name of **"IMSA - Building Fund"** payable at New Delhi, and sent to the Headquarters.

Thanking you in anticipation and warm regards,

Yours Sincerely,
Dr. K. Jagadeesan,
President, IMSA,WHQ

IMSA Chapter Activities CME Programmes

IMSA TN Chapter

14.10.18:	Dr. Venkatadri N	<i>Topic:</i>	<i>Neurotransmitters which makes us Human;</i>
	Dr (Mrs) S Swatam Jothi	<i>Topic:</i>	<i>Anatomy for Clinicians.</i>
11.11.18:	Dr V Gowri	<i>Topic:</i>	<i>Platelets – The Silent Army;</i>
	Dr R Padmavathi	<i>Topic:</i>	<i>Metastatic Cancers of Unknown Primary Site (Cups) – Diagnostic Approach;</i>
	Dr Vidhya Vishwanathan	<i>Topic:</i>	<i>Diagnostic Approach to Inborn Errors of Metabolism.</i>
10.12.18:	Dr K.V.S.Latha	<i>Topic:</i>	<i>Etiology and Pathogenesis of Cancer of Oral cavity and Role of Chemotherapy in a Ca Oral Cavity;</i>
	Dr. R. R. Kartikeyan	<i>Topic:</i>	<i>Staging and Surgical Treatment of Oral Cavity Cancers;</i>

Dr K R Prasanna Kumar Topic: *Role of Radiotherapy in Oral Cavity Cancers.*

Election of Fellows & Members: October – September 2018

Fellowship

Dr Ravindra Baliram Ingale
Dr Girijanandan Mahapatra
Dr Pradeep Aggarwal
Dr Arun Kumar Shah
Dr Kunal Tewari
Dr Rashmi Rasi Datta
Dr Afroz Abidi

Dr Sapna Gupta
Dr K Ravi
Dr Vivek Sharma
Dr K Karthikeyan
Dr Shivashankara K N
Dr Suresh S
Dr Vijai Pratap

Dr Eli Mohapatra
Dr Divya Gupta
Dr Shalini Sharma
Dr Padma Priya
Dr Malvika Saxena
Dr Ajithkumar K
Dr Najmul Huda

Membership

Dr Thakkar Shrijikumar C

Associate Membership

Dr Adil Ummer

Dr Anand Babu P

IMSA WHQ Building – List of Donors

Dr. Sampath Prabhu (UAE)	Rs. 50000.00	Dr. Sheela Mathew (Kerala)	Rs. 7000.00
Dr. K. Jagadeesan (Chennai)	Rs. 48000.00	Dr. B. N. S. Walia (Chandigarh)	Rs. 6000.00
Dr. Nitin M. Rathod (Mumbai)	Rs. 30000.00	Dr. Roseline Fatima William (Salem)	Rs. 5000.00
Dr. H. S. Luthra (USA)	Rs. 25000.00	Dr. Deepti Shastri (Salem)	Rs. 5000.00
Dr. S. M. Pasumurthy (Hyderabad)	Rs. 25000.00	Dr. N. D. Ramanujam (Chennai)	Rs. 5000.00
Dr. M. Chandrasekaran (Chennai)	Rs. 25000.00	Dr. Neeraj Jain (New Delhi)	Rs. 5000.00
Dr. Sandip Mukerjee (New Delhi)	Rs. 15000.00	Dr. Meenakshi Chaswal (New Delhi)	Rs. 5000.00
Dr. P. D. Gulati (New Delhi)	Rs. 10000.00	Dr. Kamlesh Chopra (New Delhi)	Rs. 5000.00
Dr. Anupam Sibal (New Delhi)	Rs. 10000.00	Dr. Satya Prakash (New Delhi)	Rs. 5000.00
Dr. Pradeep Christopher (Chennai)	Rs. 10000.00	Dr. R. Ravichandran (Oman)	Rs. 5000.00
Dr. Teja Ram (New Delhi)	Rs. 10000.00	Dr. Indra Bahl (New Delhi)	Rs. 5000.00
Dr. Edwin Devadoss (Bangalore)	Rs. 10000.00	Dr. Mahesh M. (Mysore)	Rs. 1000.00
Dr. Rani Devadoss (Bangalore)	Rs. 10000.00	Dr. R. Prabhakar (Chennai)	Rs. 1000.00
Dr. Poorna R. Devadoss (Bangalore)	Rs. 10000.00	Dr. Brahm Vasudev (New Delhi)	Rs. 1000.00
Dr. N. Gopakumar (Trivendrum)	Rs. 10000.00		

The President Dr. K. Jagadeesan and the members of Board of Trustees of IMSA, WHQ, request all the fellows & members of IMSA to contribute at least Rs. 5000.00 towards Building Fund for IMSA, WHQ, New Delhi. Cheque may please be drawn in favour of "IMSA Building Fund"

IMSA Conference News



IMSACON 2020

'MEDICINE & BEYOND'

6th & 7th November, 2020

Venue: Terna Auditorium, Nerul (West), Terna Auditorium, Terna Medical College, Hospital and Research Centre, Nerul (W), Navi Mumbai, Maharashtra, India

Conference Secretariat: **Dr. Dnyanesh M. Belekar**, Dept. of General Surgery, Terna Medical College, Hospital and Research Centre, Nerul (W), Navi Mumbai, Maharashtra, India **Mobile:**+91-9820055482, **Email:** dnyanesh1475@gmail.com

Contact for Details:

IMSA Headquarters: imsawhq07@gmail.com, www.imsaonline.com

Table of Contents

ORIGINAL ARTICLES

To study factors influencing Neurological Outcome, Fusion Rates and Complications in Traumatic Odontoid Fractures – Non Randomized Ambispective Study 208
Anil Kumar, TJ Rappai, Parikshit Gopal, Salil Jena

Estimation of Anamnesis and Gestation Course, Complicated with Premature Discharge of Amniotic Fluids 214
Nigar Adalat Ibragimova, Izzet Arif Shamkhalova

Epidemiological knowledge on HIV infection as a basic for programme of prophylactic measures 218
Olga Vladimirovna Azovtseva, George Sergeyevich Arkhipov

HCRT Evaluation on H1N1 Pneumonia 222
Tushar Madhavrao Kalekar, Abhijit Mahaveer Patil, Amarjit Singh

Fetal kidney length as a parameter for determination of gestational age in Second trimester of pregnancy 227
Neelu Luther, Patnaik VVG, Nidhi Puri, Amit Mittal

Randomized Controlled Study to Evaluate Comparative Efficacy of Intrathecal Clonidine and Dexmedetomidine as Adjuvants to Hyperbaric Bupivacaine for Spinal Anaesthesia for Lower Limb Surgeries 231
Hardeep Bariar, Manjeet Singh, Sahil Garg, Parmod Kumar

CASE REPORT

Abdominal Vascular Compression Syndromes and Imaging Features. 237
B Srinivasa Reddy, Hameed Arafath, B. Mallikarjunappa

Effectiveness of Ultrasound Biomicroscopy (UBM) in ensuring success in secondary IOL implantation 241
Shashi Prabha Prasad, Rupali Maheshgauri, Shivani P Pattnaik, Priti Kumari, Richa B Naik, Pari S Desai, Brig Amarjit Singh

BRIEF COMMUNICATION

Determinants for predicting number of discharges in a tertiary care hospital 245
Kasturi Shukla, Nirmal Shah, Hem Chandra

DETAILED INSTRUCTION TO AUTHORS 250

COPYRIGHT FORM 253

SUBJECT INDEX 259

AUTHOR INDEX 260

To study factors influencing Neurological Outcome, Fusion Rates and Complications in Traumatic Odontoid Fractures – Non Randomized Ambispective Study.

Anil Kumar¹, T. J. Rappai², Parikshit Gopal³, Salil Jena⁴

¹ Classified Specialist & Assistant Professor, Surgery and Neurosurgeon,

²Head of Department & Senior Advisor Surgery and Neurosurgeon, ⁴Resident, General Surgery
Department of Neurosurgery, Base Hospital Delhi Cantt, New Delhi, India

³Assoc Prof, ACMS & Base Hospital Delhi Cantt, New Delhi, India

Abstract

Background:

The cervical spine is the most mobile portion of the spine and the most common site of spinal injuries. Cervical spine is involved in 60% of adult spine injuries. Teens and young adults are the most frequently injured population. Odontoid fractures comprise 9-20% of all cervical spine injuries. Due to the strategic location of the fracture, many patients succumb at the scene of the accident due to spinal cord injury.

Methods:

Around 150 patients admitted for elective/emergency surgery at the Neurosurgical Centre of a tertiary care hospital having traumatic odontoid fracture-dislocation were included in the study after applying inclusion and exclusion criteria. A preoperative x-ray of the cervical spine with anteroposterior and lateral view, NCCT with 3D Recon CVJ, MRI CVJ & Cervical spine, to assess bony injuries, ligamentous injuries, cord contusions/myelomalacia were done. Post-surgery after 3 months X-ray CVJ and NCCT 3D Recon CVJ done to assess screw placement accuracy, mal-alignment and fusion. Improvement in neurological status and complications postoperatively, after 3 months was recorded and analyzed using relevant statistical data.

Results:

Around 135 (89.4%) out of 151 sustained injury due to RTA. Amongst them preoperatively 74.9% were neurologically intact. In cervical spine injuries, odontoid fracture was most common and 87.5% patient improved neurologically after surgery, while in 12.5% patients no neurological improvement was seen. Fusion was seen in 59.6% patients with odontoid fracture. In 67 patients with odontoid fractures, in 77.2% patients lag effect was observed. In 22 [55%] patients in whom fusion was seen, lag effect was seen in 77.2% patients, whereas in 18 [45%] patients where fusion was not seen lag effect was found in 22.2% patients. In 19 patients in whom fusion was not seen, 6 patients had lag effect present. This was statistically significant ($p < 0.001$).

Conclusion:

In odontoid fractures, 69.54% had Neurological improvement, in anterior approach 25.82% fusion of odontoid screw occurred in 60.6% while in posterior it was 55%. The patients in whom after odontoid screw fixation lag effect were seen better fusion was observed.

Keywords:

Odontoid, Myelopathy, Lag effect, Fusion, Cervical spine

Introduction

The cervical spine is the most mobile portion of the spine and the most common site of spinal injuries. Cervical spine involves 60% of adult spine injuries. Teens and young adults are the most frequently injured population.

Address for correspondence

Dr T J Rappai, Head of Department & Senior Advisor Surgery and Neurosurgeon, Department of Neurosurgery, Base Hospital Delhi Cantt, New Delhi- 110010 e-mail: tjrapai@hotmail.com

Received: 13.09.18

Accepted: 25.01.19

Odontoid fractures comprise 9-20% of all cervical spine injuries [1-4]. Due to the strategic location of the fracture, patients succumb at the scene of the accident due to spinal cord injury [5]. In surviving patients, the most common symptom is pain; major neurological deficits are infrequent [6]. The problem with the conservative management of these fractures is the risk of non-union and delayed development of myelopathy [7,8].

Anderson and D. Alonzo (1974) [9] have classified odontoid fractures into three types. Based on this universally accepted classification, the type II and III

odontoid fractures often require some form of stabilization[10]. However, optimum treatment strategy, whether to perform surgery or to continue the patient on conservative management is still mired in controversy [11,12]. The surgical approaches prevalent for dealing with acute odontoid fractures include either anterior odontoid screw placement or posterior fixation [13-15]. Anterior fixation has advantage of preserving C1-C2 motion and head/neck rotation. We conducted this study to assess factors influencing neurological outcomes, fusion rates, complications in traumatic odontoid fractures –nonrandomized ambispective study.

Material and Methods

Present study conducted in Department of Neurosurgery at Tertiary Centre where admitted cases with odontoid fractures injuries were included in the present study. Patients were studied prospectively from Jan 2015 to Dec 2017 and retrospectively from Jan 2004 to 31 Dec 2014. Patients having sub axial spine injuries and congenital CVJ anomaly were excluded from study. Purpose of study was explained and written and informed consent obtained from all patients who participated in the study. Sample size of 151 participants were evaluated with preoperative imaging X-ray, CT, MRI and postoperative imaging at 03 months with X-ray and CT scan to see for fusion and complications. Neurological outcome was assessed using ASIA and SF36 scoring.

Data was analyzed using statistical software Stata 12.1. Quantitative variables were expressed as Mean +/- SD. Qualitative variables expressed as frequency and percentage. Quantitative variables followed normal distribution were compared by independent test. McNemor test used to assess change in ASIA score. Chi

square/Fischer exact test used to check the statistical significance for categorical variable; $p < 0.05$ was considered as statistically significant.

Results

One hundred and fifty-one patients were studied, odontoid fractures commonly occurred in young age groups <40yrs (69.5%) and predominantly in males (89.4%). Majority of these injuries were caused by high energy trauma (54.9%) and largely patients were neurologically intact preoperatively (74.1%). Only 25.8% patients had neurological deficit preoperatively. Statistically significant association was observed between odontoid fractures and demographic variables like age and sex.

In odontoid fracture (56.9%) underwent anterior odontoid screw fixation while (43.1%) patient underwent posterior fixation and this was statistically significant. (87.5%) patient improved neurologically after surgery while in (12.5%) patients were neurologically same and this association was statistically significant. Bony fusion was seen in (59.6%) odontoid fracture patients. Main complications that occurred postoperatively in odontoid fracture was CSF leak in (9.2%) patients while wound infection occurred in (2.3%), meningitis occurred in (1.5%) patients, death occurred in (1.3%) patients. Redo surgery was done in 5 patients after odontoid screw fixation who subsequently underwent posterior fixation.

Patients with odontoid fractures, lag effect were seen in (77.2%) patients. In (55%) patients in whom fusion was seen, lag effect was found in (77.2%), whereas in (45%) patients where fusion was not seen, lag effect was found in 22.2%.

Table 1: Demographics of Odontoid Fractures

TYPE OF FRACTURE	AGE	SEX	MOI	PREOP. NEUROLOGICAL STATUS
ODONTOID FRACTURE [n=151]	<40yr-105[69.5%] 40-60yr-36[23.8%] >60yr-10[6.6%] P value-0.002[S]	Male-135[89.4%] Female-16[10.5%] P value-0.017[S]	High velocity trauma-83[54.9%] Low velocity trauma-61[40.3%] Others-7[4.6%]	Normal[ASIA-E]-112[74.1%] Deficit[ASIA-A,B,C,D]-39[25.8%]

Table 2: Neurological and Radiological Outcome

TYPE OF FRACTURE	NEUROLOGICAL OUTCOME	RADIOLOGICAL OUTCOME
Odontoid Fracture [n=40]	(n=40) Improved-35[87.5%] Same-5[12.5%] Worse-Nil P value-0.00001[S]	n=62 Fusion- 37(59.6%) No Fusion-25(40.3%)

Table 3: Lag effect and fusion in anterior odontoid screw fixation (n= 67)

TYPE OF FRACTURE (n =67)	LAG EFFECT ATTAINED (n =44)	LAG EFFECT NOT ATTAINED (n =23)
Fracture Configuration Transverse-(n=15)-22.3% Oblique-(n=38)-56.7%	12[80%] 25[65.7%]	3[20%] 13[34.2%]
Reverse Oblique-(n=14)-20.8%	7[50%]	7[50%]
TAL RUPTURE- Yes-[n=6] No-[n=39]	Not attempted 30[76.9%]	Not attempted 9[23.0%]
DISPLACEMENT Yes[n=12] No[n=55]	2[16.6%] 49[89.0%]	10[83.3%] 6[10.9%]
BICORTICAL PURCHASE Yes[n=23] No[n=44]	22[95.6%] 24[54.5%]	1[4.3%] 20[45.4%]
SCREW TRAJECTORY		
Ideal-[n=48]	40[83.3%]	8[16.6%]
Non Ideal-[n=19]	4[21%]	15[78.9%]
FUSION-[>3month](n=43)* Yes[24]55% No[19]45%	22[91.6%] 6[31.5%]	2[8.3%] 13[68.4%]

P value <0.001(S)



Figure 1: No bony fusion

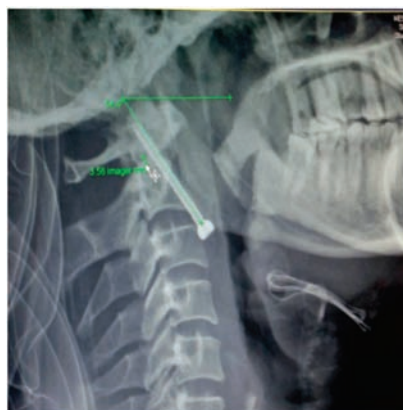


Figure 3: Bicortical purchase of screw



Figure 2: Bony fusion seen



Figure 4: Unicortical purchase of screw

Discussion

Odontoid fracture Type II is the most common type of odontoid fracture and is considered to be highly unstable. Type II fractures are managed by cervical collar, anterior odontoid screw fixation and posterior C1-C2 instrumentation with fusion. In light of high incidence of nonunion with external immobilization, primary surgical management has been recommended (anterior odontoid screw fixation or posterior C1-C2 instrumentation and fusion). Posterior C1-C2 fusion rather than anterior odontoid screw fixation is used in type II displaced odontoid fractures that are associated with C1-C2 instability secondary to transverse ligament injury and symptomatic nonunion that develops after external immobilization or failure to achieve anterior odontoid screw fixation (technical/patients factors).

Conservative management using a halo brace is associated with variable fusion rate between 53-93% [19]. Shetty et al. [15] demonstrated an 84.2% fusion rate with conservative management in stable type II fractures. Literature shows that there is a growing trend towards surgical fixation of these fractures as fusion rates are better and the patients may be mobilized early. In the present series primary surgical intervention was preferred in all patients except the 13, who were either declared unfit for surgery or were not willing for surgical intervention.

Since its initial description by Nakanishi and by Bohler [16,17], anterior odontoid screw fixation has withstood the test of time. This procedure allows for a more physiological fusion by direct osteosynthesis of the fracture lines and has the advantage of preserving normal rotation at atlantoaxial joint. Eighty six patients, who had acute, well defined odontoid fractures with an intact transverse ligament, underwent odontoid screw fixation at our Centre. The fusion rate of 60.6% after odontoid screw fixation noted in present series while in literature it is 80-100% [13,14], while as per Dattaraj et al fusion rate was [95%] [18]. Many authors have recommended posterior fixation as the procedure of choice for the surgical approach in type III fracture due to slightly higher nonunion rate associated with odontoid screw fixation. Our results of 45.83% fusion rates in type II fractures is different from published literature. [22] Moon et al., Fountas et al. [19] and Lee et al. [20] in their series showed fusion rates of 100%, 87% and 96% respectively. Bhanot et al. [21] reported a 94% fusion rate with one case of nonunion and one screw pull out in their series of 17 type II odontoid fractures after an anterior odontoid screw fixation. N Shrinivasan et al. [22] could successfully place odontoid screw in 84.6% type II fractures with an 82% fusion rate.

Aldrian et al. [2011] [23] showed a good fusion rate of 87% after odontoid screw fixation in type II fracture and have also recommended it as the first line of management in comminuted odontoid fractures. Other authors, in a contrasting opinion, have recommended against utilizing an odontoid screw fixation in comminuted fractures due to the high nonunion rates and have preferred the posterior fixation technique. In our present series out of four patients with comminuted fracture, with type II A fracture who underwent odontoid screw fixation, three patients showed a good union while one patient, who developed non-union was successfully managed by posterior fixation which are comparable to results of Duttaraj et al. [18]. A recommendation by Aldrian et al. [23] is that in type II A fracture, the initial surgical procedure should be an anterior odontoid screw fixation; and posterior fixation should be reserved for cases where the initial procedure fails.

In elderly patients, the available class III evidence recommends surgical over conservative management. Which operative approach to adopt is still a matter of debate. According to a recent meta-analysis by Ryken et al. [14] a wide ranging opinion exists with some authors reporting no difference in the results of anterior versus posterior approaches while others have preferred one approach over other. Overall, ten patients with age greater than 60 yrs underwent surgical intervention (odontoid screw fixation-6; posterior fixation-4 patients) and all of them showed a good bony union, while as per literature Duttaraj et al. (18) seven patients with age greater than 60 yrs underwent surgical stabilization [OS fixation-6, PF-1] and all of them showed good bony union. Therefore, an elderly age should not be a contraindication for the odontoid screw fixation. We used a single cannulated, partially threaded lag screw in all these patients with good results. The current literature also supports our approach in that there is no difference in the fusion rates with either a single or double screw placement.

Overall there was morbidity of 11% and mortality of 1.1% in our series. This was comparable to the published literature [18]. The one procedure related death was due to diffuse SAH as a result of cranial migration of the K wire. Occurrence of SAH was probably due to vascular injury. This complication has rarely been reported with an odontoid screw placement and only three cases have been published in the literature. In our patient, this may have been the result of a mal-positioned K wire or a misplaced screw [18]. Hence, one should be very careful while drilling a hole in the odontoid process especially during the process of achieving the bicortical purchase. Maneuvers such as the use of a stopper to prevent migration, screw placement under image guidance and

utilizing only a unicortical purchase are possible solutions to avoid this un- fortunate complication.

We performed primary posterior fixation in 65 patients [43.04%] with fusion rate of 45.83%. Inclusion of occipital bone in the construct was associated with significant compromise of neck movements. Mageryl technique may be used as a stand-alone procedure or may be supplemented with a C1-C2 sub laminar wiring. Addition of sub-laminar wiring, however, did not change results of this technique in our series. This procedure is technically difficult and requires a steep upward trajectory. The three-point rigid fixation and cost effectiveness of the procedure is responsible for its popularity. The Goel/Harms technique of C1-C2 fixation is more versatile when compared to the former procedure. There is, however, a risk of 1.3-5.8% [more with Mageryl technique] of vertebral artery injury in posterior fixation technique. In our study, one patient had vertebral artery injury [0.71%] following posterior fixation. The C1-C2 wiring and graft placement technique was used in 11 patients who, however, had a poor outcome. The biomechanical strength of this fixation is also less than ideal as compared to Mageryl or Goel/Harms procedure [that provides a strong rotational stability]. Therefore C1-C2 sub laminar wiring technique should be used as the last resort. Shetty et al. [15] in their retrospective series showed a 100% fusion rate after posterior C1-C2 arthrodesis with the Mageryl technique [eight patients] and the Goel/Harms technique [three patients] compared with C1-C2 sublaminar wiring and graft fixation [nine patients] that had failure rate of 33%.

Occipito cervical fixation is the final option available when segmental posterior C1-C2 fixation procedures cannot be performed; or when the patient has undergone a simultaneous trans oral decompression of the malunited fractures. We performed an occipito cervical fusion in 27 patients. 9 of them underwent occipito cervical fusion following transoral odontoidectomy for anterior compression. All these patients had a good fusion [and results were comparable to literature] but at the cost of significant neck movements compromise.

Conclusions

- 1.) In odontoid fractures, patients improved neurologically after surgery and majority were managed by anterior odontoid screw fixation. Posterior approach was used only for displaced fracture fragments with ruptured transverse atlantoaxial ligament.
- 2.) Bony fusion was good if lag effect was achieved. Patients with fracture type – transverse, oblique with ideal screw angle, lag effect, reduction of

intersegmentary distance and bicortical purchase had good fusion rate and clinical outcome.

Conflict of interest:	All authors declare no COI
Ethics:	There is no ethical violation as it is based on voluntary anonymous interviews
Funding:	No external funding
Guarantor:	Dr T J Rappai will act as guarantor of this article on behalf of all co-authors.

References

1. Buchholz RW, Burkhead WZ, Graham et al. Occult cervical spine injuries in fatal traffic accidents. *J Trauma* 1979;19:768-71.
2. Rizvi SA, Fredo HL, Lied B, Nakstad PH, Ronning P, Helseth E et al. Surgical management of acute odontoid fractures: surgery related complications and long term outcomes in a consecutive series of 97 patients. *J Trauma Acute Care* 2012;72:682-90.
3. Moskovich R, Crockard HA et al. Myelopathy due to hypertrophic non union of dens: Case report. *J Trauma* 1990;30:222-5.
4. Crockard HA, Heilman AE, Stevens JM et al. Progressive myelopathy secondary to odontoid fractures: Clinical, Radiological and Surgical features. *J Neurosurg* 1993;78:579-86.
5. Anderson LD, D Alonzo RT et al. Fractures of the odontoid process of the axis. *J Bone Joint Surg Am* 1974;56:1663-74.
6. Hadley MN, Browner CM, Liu SS, Sonntag VK et al. New subtype of acute odontoid fractures. *Neurosurgery* 1988;22:67-71.
7. Roy-Camille R, Saillant G, Judet T, deBotton G, Michael G et al. Factors of severity in the fractures of the odontoid process. *Revchirorthop Reparatrice Appar Mot* 1980;66:183-6.
8. Shears E, Armitstead CP et al. Surgical versus conservative management for odontoid fractures. *Cochrane Database Syst Rev* 2008;cd 005078.
9. Ryken T, Hadley M, Aarabi B, Dhalls, Gelb D, Hurlbert J et al. Management of isolated fractures of the axis in adults. *Neurosurgery* 2013;72:132-50.
10. Aebi M, Etter C, Coscia M. et al. Fractures of the odontoid process. Treatment with anterior odontoid screw fixation. *Spine [Phila Pa 1976]* 1989;14:1065-70.
11. Apfelbaum RI, Lonser RR, Veres R, Casey A. et al. Direct anterior screw fixation for recent and remote odontoid fractures. *J Neurosurg* 2000;93:227-36.
12. Magerl F, Seeman PS. et al. Stable posterior fusion of the atlas and axis by transarticular screw fixation. In Kehr P, Weidner A, editors. *Cervical spine*. Berlin Heidelberg New York: Springer; 1986. pp 322-327
13. Harms J, Melcher R, Petal. Posterior C1-C2 fusion with polyaxial screw and rod fixation. *Spine [Phila Pa 1976]* 2001;26:2467-71.
14. Julien TD, Frankel B, Traynelis VC, Ryken T C et al. Evidence based analysis of odontoid fractures management. *Neurosurg Focus* 2000;8:e1.
15. Shetty A, Kini AR, Prabhu J et al. Odontoid fractures: A retrospective analysis of 53 cases. *Indian J Orthop* 2009;43:352-60.
16. Nakanishi T. Internal fixation of the odontoid fractures. *Cent Jpn J*

- Othop Trauma Surg 1980;23:399-406.
17. Bohler J. Screw-osteosynthesis of fractures of the dens axis. *Un fallheilkunde*1981;84:221-3.
 18. DattarajPS, PankajKS, SaquibAzadSiddique, DeepakA, GuruduttaS, DeepakKG,SumitS,KaleSS,BhawaniSS.Surgical management of odontoid fractures at level one trauma centre:singlecentre series of 142 cases 2015;65:40-48.
 19. FountasKN, KapsalakiEZ, Karampelasl, FeltesCH, DimopoulosVG, MachnisTG,etal. Results of long term follow up in patients undergoing anterior screw fixation for type II and rostral type III odontoidfractures.
 20. Lee SC, Chen JF,Lee ST. Management of acute odontoid fractures with single anterior screw fixation. *J ClinNeurosci*2004;11:890-5.
 21. Bhanot A, Sawhney G, Kaushal R, Aggarwal AK, Bahadur R. Management of odontoid fractures with anterior odontoid screw fixation. *J SurgOrthopAdv*2006;15:38-42.
 22. Srinivasan US, Dhillion CS,MahesaK,KumarV.Anterior single lag screwfixation in type II dens fracture – Indian experience. *Int J Neurotrauma* 2008;5:87-91.
 23. AldrianS,ErhartJ,SchusterR,WernhartS,Ostermann R. Surgical v/s nonoperative treatment of Hadley type IIA odontoid fractures. *Neurosurgery* 2012;70:676-83.



Estimation of Anamnesis and Gestation Course, Complicated with Premature Discharge of Amniotic Fluids

¹Nigar Adalat Ibragimova, ² Izzet Arif Shamkhalova

¹Postgraduate, ² Professor

Azerbaijan State Doctors Improvement Institute,
Institute of Obstetrics and Genecology of the Ministry of Health of Azerbaijan Republic

ABSTRACT

In the article the comparisons on the basis of the socio-demographic data, medical data, obstetrics-gynecological data, and also on the basis of the conditions during the pregnancy with premature discharge of the amniotic fluids and cases of premature rupture of the membrane are depicted. It is shown that pregnancies with premature discharge of the amniotic fluids are characterized by having complications, which are affected by different factors. Such pregnancy complications as the threat of premature interruption, previous extragenital, infectious and viral diseases are also one of the factors of the premature rupture risk of fetal membranes.

Key words: Pregnancy, Complications, Premature discharge of the amniotic fluids.

Introduction

Pre-delivery discharge of amniotic fluids represents the complex obstetrics problem, many aspects of which in great extent remain unsolved in connection with the absence of single opinion in relation to the pregnancy outcome for mother and fetus [6, 7]. In connection with this for achievement of health improvement of mother and child are presently developed by the rational tactic programmes of pregnant women management with premature discharge of amniotic fluids [2, 4].

Premature discharge of amniotic fluids is met in the timely deliveries in 10-19% cases [6]. The long-term time without amniotic fluids is dangerous by the development of suppurative-septic complications in mother and fetus. Until now this circumstance is an indicator for conduction of delivery induction in 2-3 times after premature discharge of amniotic fluids. However, this tactics often leads to the development of anomalies of delivery activity and fetus hypoxia in deliveries and, as a result, to the increase of frequency of operative delivery and natal complications [3, 5].

The aim of research is to study peculiarities of pregnancy

management and delivery outcome at the premature discharge of amniotic fluids.

Material and Methods

214 pregnant women were under observance in the second and third trimester aged from 18 to 43 years old (average age is 27.3 ± 3.82 years old). The basic group was made by 180 pregnant women with the threat of pregnancy interruption, and also different pathology of premature rupture of fetal membranes. In the control group 34 women with physiological course of pregnancy entered into this group. The pregnant women with threat of PRFM were divided into three groups according to the term of gestation: I group – 16-21 weeks of gestation – 49 (27.2%), II group – 22-27 weeks of gestation – 50 (27.8%), III group – 28-36 weeks of gestation – 81 (45%).

The data of anamnesis of all patients, course and complication of the present pregnancy, deliveries and post-natal period were studied. The data of somatic and obstetrics anamnesis were analyzed.

The materials of study were developed at assistance of computer programme STATISTICA 6.0 [1]. The criteria of significance $p > 95\%$ was taken as the minimal threshold of reliability.

Results and Discussion

According to the design of conducted study, I experimental group was made by 81 ($45.0 \pm 4.9\%$, $p \leq 0.001$) pregnant women with the threat of premature miscarriages (gestation term is 16-21 weeks), complicated by

Address for correspondence

Dr. Nigar Adalat Ibragimova, Azerbaijan State Doctors Improvement Institute, Institute of Obstetrics and Genecology of the Ministry of Health of Azerbaijan Republic
Email: Gulnaramz@gmail.com

Received: 22. 01.15

Accepted: 02. 03.17

premature discharge of amniotic fluids. 50 (27.8±5.8%, $p \leq 0.001$) patients with the threat of late miscarriages (gestation term is from 22 to 27 weeks) entered into II group. 49 (27.2±4.7%, $p \leq 0.001$) examined ones with the threat of premature deliveries (gestation term is 28-36 weeks) entered into III group.

The examined women of I group were aged from 18 to 31 years old that made in average 22.72±4.72 years old. Among pregnant women of II and III groups the age range was represented from 18 to 36 years old. The pregnant women, included in the control group, were aged within from 20 to 30 years old, average age is 23.28±7.93 years old.

The results of conducted study showed that in I group the first pregnancy was in 47 (58.0%), and repeated pregnancy – in 34 (42.0%) of women. In women of the control group the first pregnancy was observed in 10 (52.6%) and repeated pregnancy in 9 (47.4%) patients. Primipara pregnant women in I group were 60 (74%), multipara – 21 (25.9%). In the group of healthy pregnant women there were 12 (63.1%) and 7 (36.8%), respectively.

It follows from the data stated that pregnant women differed by number of primary and repeated deliveries. Thus, the number of primipara women of I group in several times exceeded the same one in the control group for 5.4%, and the number of multipara women was smaller at the same quantity. It should be noted that from 18 (37.5%) of multigravida of I group 10 (20.8%) women were primipara ones, and in the group of healthy pregnant women – from 4 (57%) only 2 (28.6%) were primipara women. At comparison of indicators of all three experimental groups it was detected that the first pregnancy in II group made 28.0% (14 women) cases, and in III group – 29.3% (12) cases. The number of repeated pregnant women in these groups made respectively 37 (73.4±6.3%, $p \leq 0.001$) and 36 (73.3±6.2%, $p \leq 0.001$) patients. In II group of primipara women was 26 (52.0±5.3%, $p \leq 0.001$), and in III group – 28 (57.1±4.9%, $p \leq 0.001$) respectively. Multipara women with gestation term 22-27 weeks made 42.0±5.8% cases (21 pregnant women), with the term of pregnancy 28-36 weeks – 49.0±8.2% cases (24 women).

The pregnant women of I group indicated on the age of menarche beginning from 10 to 16 years that averagely made 13.10±0.70 years old. The early age of menarche beginning is 10 years was marked in I group in 9 (18.7%) pregnant women, on the later menarche (16 years) marked 6 (16.7%) pregnant women. In II and III groups, as in I group the age of menarche beginning fall on the interval of 10-15 years. However, the early age of

menarche beginning (in 10 years) was marked only in 4 women in each group that made respectively 8±1.9 and 8.2±2.1 % cases. In the control group the age of menarche beginning was registered within the limits of 11-15 years that made averagely 12.8±2.7 years old.

It is known that social factors are the important factor of risk of pregnancy interruption on the early terms (up to 28 weeks) and premature deliveries. The conducted studies showed that pregnant women in all three experimental groups with premature discharge of amniotic fluids were under effect of such factors, as the low level of social provision, disorder of family life and harmful conditions in the daily routine and on the work.

In the process of study the dependence in the development of premature discharge of amniotic fluids from several medical factors of risks was detected. The analysis of anamnestic data showed that abortions and interrupted pregnancies up to 28 weeks in the examined pregnant women, premature deliveries and diseases of urogenital system of inflammatory character took place (Figure 1). On the whole, in the group of pregnant women with premature discharge of amniotic fluids the number of abortions was registered in 102 (56.7±4.9%) women, that in 1.7 times higher than in the control group (32.3±4.0%), the number of miscarriages – in 157 (87.2±2.7%), that in 4.5 times exceeded indicators of control group (17.6±5.5%). The premature deliveries in the anamnesis were met only in the patients with premature rupture of fetal membranes in 53.9±5.1% cases (97 women). 168 (93.3±1.92%) women of experimental and 6 (17.6±5.5%) patients of the control group indicated on presence of urinogenital infection.

Among the previous diseases in the patient's anamnesis there were frequent ARVI until the present pregnancy – 45.5% cases (82 women), anemia – in 50.0% (90) cases, hypertension disease – in 29.4% (53) cases, hypotonic disease – in 17.8% (32) cases, digestive system diseases – in 9.4% (17) cases, urinary system – in 27.2% (49) cases. From the gynecological diseases in the anamnesis in the period between pregnancies in the patients of experimental group, coleitis of different etiology was met in 39 (21.7%), salpingo-oophoritis in 27 (15.0%), endocervicitis in 5 (2.7%).

This pregnancy passed with complications in 142 (78.8±3.2%, $p \leq 0.001$) pregnant women of experimental group. These complications displayed themselves in pains in lumbar spine and in the lower abdominal department, periodic pressure boost, anemia and presence of protein in the urine.

The results of study showed that in pregnant women in all experimental groups met more frequently in the lower

abdominal department and in the small of back. During collection of anamnestic data the pregnant women complained more frequently on the pain in the small of back with the term of pregnancy 16-21 weeks. At that pains, as a rule, bear spasmodic and also aching-nagging character. On the whole, according to groups the nagging pains were observed in 20 patients, from which in 11 the term of pregnancy made 16-21 weeks. The spasmodic character of pains also was typical for pregnant women of I group – 13 of 19 pregnant women. The dull character pains during long time are most frequently present in the pregnant women of III group (Figure 2).

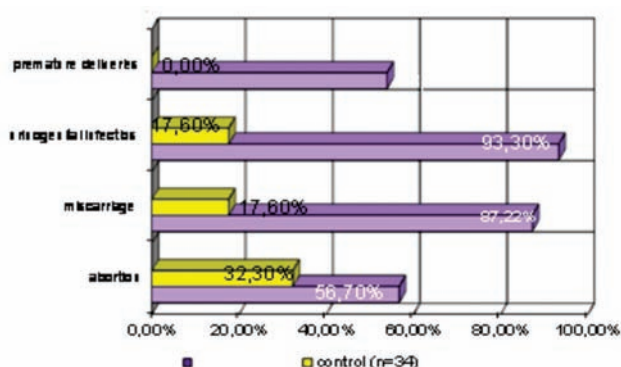


Figure 1: Indicators of obstetrics anamnesis in the examined pregnant women

complications, which are effected by different factors. We should relate to unsatisfactory social and living conditions, unsettle state of family life, low educational level, repeated and frequent pregnancies, young and elder age of woman to the social-demographic factors. The previous medical abortion, spontaneous miscarriages, infectious and inflammatory urinogenital system diseases serve as clinical-anamnestic factors of risk. The different complications of the current pregnancy, such as the threat of premature pregnancy interruption, previous extragenital, infectious and viral diseases are also the factors of risk of the premature rupture of fetal

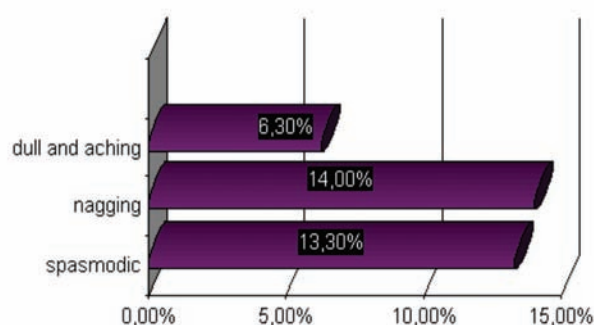


Figure 2: Character of pains in the examined pregnant women of experimental group

Table 1 : Occurrence frequency of pregnancy complications in the experimental groups

Pregnancy complications	Experimental groups					
	I group (n=49)		II group (n=50)		III group (n=81)	
	Abs.	%	Abs.	%	Abs.	%
Lumbar pain	20	40.8	8	16.0	7	8.6
Lower abdominal department pains	27	55.1	13	26.0	7	8.6
Anemic	12	24.5	10	20.0	8	9.9
Hypertension	3	6.1	7	14.0	6	7.4
Albuminuria	-	-	1	2.0	6	7.4
Edemas	4	8.2	3	6.0	1	1.2

Edemas (8.2%) and anemia (24.5%) were most frequently met in the pregnant women of I group, however the protein in urine was not detected (Table 1).

Albuminuria was detected in 2.0% cases, edemas – in 6.0% and anemia – in 20.0% in the pregnant women of II group. In the presence of albuminuria was detected in 7.4%, edemas – in 1.2% and anemia – in 9.9% in the pregnant women of III group.

The difference was also detected in relation to indicators of the arterial pressure. The indicators of arterial pressure increased averagely to 140-150/90-100 mm Hg in the pregnant women of I group. The average arterial pressure made 150/100 mm Hg in II and III groups.

Thus, the pregnancy course in women with premature discharge of amniotic fluids is characterized by

membranes.

Conflict of interest:	All authors declare no COI
Ethics:	There is no ethical violation as it is based on voluntary anonymous interviews
Funding:	No external funding
Guarantor:	Dr. Nigar Adalat Ibragimova will act as guarantor of this article on behalf of all co-authors.

REFERENCES

- Borovikov V. P. Statistica. Art of computer data analysis. SPb.: Piter, 2003, 688 p.
- Zhatkanbaeva G.Zh., Nurseitova L.A., Nasyrova Sh.T., Altynbaeva L.Zh. Doctor tactics at the premature discharge of amniotic fluids //

- Actual issues of obstetrics, gynecology and perinatology, 2005. – P. 67-69.
3. Kozlov P.V., Nikolaev N.N., Degtyaryev D.N., Lutsenko N.N. Ways of reduction of perinatal mortality at the incomplete pregnancy, complicated with premature rupture of fetal membranes // Materials of 7th Russian Forum "Mother and child". 2005, p. 100-101.
 4. Kozlov P.V., Nikolaev N.N., Degtyaryev D.N., Lutsenko N.N., Maltseva S.A. Tactics optimization of incomplete pregnancy management, complicated with PRFM // Materials of 5th convention of the Russian Association of the perinatal medicine specialists, 2005, p. 80-81.
 5. Makarov O.V., Nikolaev N.N., Kozlov P.V., Maltseva S.A., Lutsenko N.N. The frequency of infectious complications development in the fetus in dependence on the tactics of incomplete pregnancy management, complicated PRFM in the different gestation terms // Materials of 4th Congress of pediatrician-infectiologists of Russia, 2005, p. 110.
 6. Maksimovich O.N., Protopopova N.V., Ilyin V.P. Premature discharge of amniotic fluids: reasons, diagnostics, pregnancy and delivery management // Bulletin of SSC SB RAMN. – 2006. – No. 3. – p. 207-212.
 7. Nosareva S.V. Premature discharge of amniotic fluids. Methods of delivery induction. Abst. diss. ... med. scien. can. M; 2003



Epidemiological Knowledge on HIV Infection as a Basic for Programme of Prophylactic Measures

¹Olga Vladimirovna Azovtseva, ²George Sergeyevich Arkhipov

¹Docent, ²Professor,

Yaroslav-the-Wise Novgorod State University, St. Petersburgskaya street, Veliky Novgorod, Russia.

ABSTRACT

The pandemic of HIV infection causes enormous economic damage, destabilizes the socio-political situation in many countries of the world and hinders to achievement of aims for the development of millennium, both in the area of health protection and in other spheres. An epidemic can be stopped and even compelled to step back, if to conduct adequate and comprehensive prophylactic measures in the proper time. In the Novgorod region an epidemic situation on HIV infection is estimated as one of most strained one. The basic indexes and tempos of their growth in a region are higher in relation to average federal data. The prophylactic measures, directed on the groups of population, which can be infected or can distribute HIV with the utmost probability must be the most priority.

Keywords: HIV infection, Sickness rate, Distribution rate, Prophylactic measures

Introduction

The epidemic of HIV infection already during the first years, in 80-90-s years of the last century, seriously guarded the mankind, making it to look on the problem and comprehend it from different positions. There were all bases for this purpose, as a number of people, which live with HIV, steadily increases that potentially threatens to the society and its further development [1].

According to the estimation data of UNO the general quantity of HIV infected people in the world made 33-35 mln [2]. In the range of countries it led to reduction of the expected duration of life more than for 10 years.

The prophylaxis of HIV infection must be conducted taking into account the dynamics of sickness rate and changes, which take place in the epidemic process [2]. In spite that the epidemic of HIV infection covered almost all the globe, its development in different regions have own specific peculiarities and differences, which modern detection, study and recognition can play very substantial role in the choice of the right approach and execution of the effective resistance of epidemic distribution [2, 3].

The aim of this study is determination of the character and peculiarities of epidemic of HIV infection distribution in the Novgorod region and study of the principles of its prophylaxis organization.

Method

With the purpose of estimation, detailed analysis and exposure of features for the development of HIV infection epidemic the indicators of sickness rate for 24 summer period (1990-2013) were studied, the prevailing ways of transmission, age structure and basic death reason of people with HIV infection living in Novgorod region were determined.

In work, the materials of the official statistical data conducted by the Federal scientific-methodical center on a prophylaxis and fight against AIDS were used. The statistical data on the analysis of character, epidemiological and clinical peculiarities of distribution of HIV infection in the Novgorod region are represented on the basis of data of GOBUZ «Novgorod Center on prophylaxis and fight with AIDS and the infectious diseases «Helper».

Basic Part

Presently in Russia, the distribution of HIV infection among population and increase of the cumulative number of infected people is still continuing. According to the data of the Federal scientific-methodological center on prophylaxis and fight with AIDS, the whole situation on HIV infection in Russia can be acknowledged as steadily

Address for correspondence

Olga Vladimirovna Azovtseva, *Docent*, Yaroslav-the-Wise Novgorod State University, 41 Bolshaya St. Petersburgskaya street, Veliky Novgorod, Russia. Phone: +89 11 602 50 49
Email: olga-azovtseva@mail.ru.

Received: 22. 01.15

Accepted: 02. 03.17

aggravating [4].

Presently in Novgorod area, the absolute quality of HIV-positive inhabitants enter into the group of unfavourable regions of North-West Russia (Table 1). The data about results of testing of antibodies to HIV in the North-West Federal region of the Russian Federation in 2012).

On 31st December 2013, in Novgorod 2288 cases of HIV infection were registered. The analysis of the epidemic department showed fluctuation in the ways of transmission and domination of different age groups of population in the structure of sickness rate. Presently, the essential increase of significance of the reproductive tract transmission takes place that replaced the injection infecting in drug users. For the analyzed years, the infection by sexual way is met more than in 4 times. Totally for the whole period of observance (since 1990) 41.4% of the infected people became infected by the parenteral way, 51.6% by sexual way. Drug-addiction still remains the second moving force of HIV distribution after sexual transmission [5].

In the age structure of patients the subjects younger 30 years old prevail (on the date of diagnosing), which part includes 61.1%. Recently, the part of HIV infected people older than 30 years with simultaneous reduction of indicators of sickness rate in the groups of younger age is increased.

There is the tendency of active inclusion of women into the epidemic. The involvement of women in an epidemiological process and increase of the number of infected people is connected with the parallel growth of sexual way of transmission; according to the data

infecting of women happened from HIV infected consumers of the injection drugs. Approximately, 90% HIV infected women in the childbearing age that involves the problem of HIV infection distribution from mother to child during pregnancy and delivery.

Since 2007, the increase of HIV infection frequency is observed among pregnant women, and the number of children, born from HIV infected mother grows. Perinatal HIV infection that is one of the basic reasons of child AIDS became actual one in our country upon the extent of growth of the number of deliveries in this category of women (Figure 1). The quantity of children born by HIV infected women.).

The prophylaxis of the perinatal transmission of HIV is a multi-stage, multi-profile process, including the access of women to the early pre-delivery observance, receipt of knowledge about infection, advising on the questions of HIV transmission and its prophylaxis, prescription of ART to women and children, control over the drug administration, and also social-psychological support for patients and their families [6]. Many pregnant women arrive for delivery with undetected HIV-status. As a rule, they relate to the social unfavourable people. As a result among these women the high risk of HIV transmission is observed and the big number of rates of mothers' refuses from children.

Since 1998 until presently, the detection rate of HIV among pregnant women raised in 100 times, the quantity of deliveries and born children from HIV-positive mothers considerably increased. The situation is aggravated by that averagely 22% of women have pre-delivery

Table 1: The data about results of testing of antibodies to HIV in the North-West Federal region of the Russian Federation in 2012.

North-West Federal region	Blood serum testing	HIV+	The number of antibody-positive examined blood serums for 100 000
Republic of Karelia	89434	161	180.0
Republic of Komi	189167	203	107.3
Arkhangelsk region	228601	105	45.9
Nenets autonomous district	6925	0	0.0
Volgograd region	216077	195	90.2
Kaliningrad region	127228	434	341.1
Leningrad region	201106	1122	557.9
Murmansk region	150850	350	232.0
Novgorod region	102110	378	370.2
Pskov region	101006	100	99.0
Saint-Petersburg	629307	3308	525.7

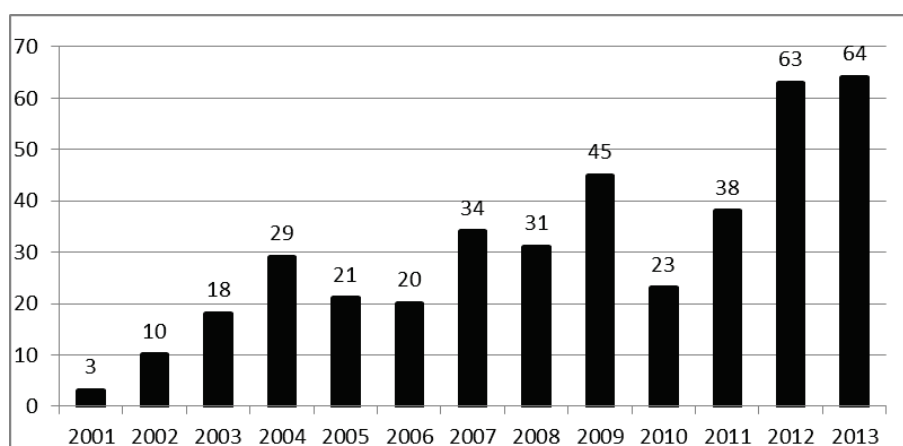


Figure 1. The quantity of children born by HIV infected women.

observance and drug addiction in this group of pregnant women is distributed 3 times more, from them 77.6% consume drugs during pregnancy [7]. The unfavourable social status of HIV-positive mother and absence of pre-delivery observation reduce the coverage of perinatal prophylaxis, promoting to the support of virus level in the blood, and are the basic factors of risk of HIV transmission from mother to child, and form the low devotion to the following dispensary observation.

In the region enough high frequency of HIV infection transmission is kept. For 12 months in 2013, 64 children were born. Prophylaxis of the vertical way of transmission was conducted in 90.3% cases (three-staged – in 46 cases, in deliveries + child – 5 cases, only to a child – 11 cases, was not conducted at all – 2 cases). The risk of perinatal HIV transmission for the whole period of observation made 8%. For comparison: in the European countries this indicator doesn't exceed 1% [8].

These circumstances require further intensification of complex measures and improvement of the work with HIV infected women on the level of mass media, in youth welfare centers, in women welfare centers in the period of pregnancy and maternity hospitals with compulsory conduction of the necessary course of chemotherapy that prevent virus infecting of children.

Annually the number of persons with progressing stages of HIV infection frequently with severe secondary diseases and infection requiring more active clinical examination, hospitalization, proper diagnostics, prescription of the antiretroviral therapy and longer treatment in increased. Totally in Novgorod region 420 HIV infected patients died, from them 139 in the stage of AIDS.

For stopping the epidemic of HIV infection it is necessary to conduct immediate prophylactic measures, which give notable effect. Without application of modern methods of management of this work it will be impossible to

receive necessary results [9].

The world history of HIV infection prophylaxis shows that the epidemic can be stopped and even force to step back, if timely to conduct adequate and comprehensible prophylactic measures. The prophylactic measures, directed on the groups of population, which can be infected and distribute HIV with utmost probability must be the priority. The detection of the infected people in the group of risk is extremely important task of any national programme [10].

The distribution of HIV can be slowed down due to the changes of social behavior of population: reduction of the quantity of sexual partners and partners on intravenous drug injection, the usage of contraceptives during the sexual act, and application the sterilized instruments for intravenous injections. The most effective way of epidemic limitation in the conditions of vaccine absence is the reduction of risk behavior.

At organization of the work upon prophylaxis of HIV infection it is necessary to use principles of the public health system, directed on improvement of the health and prevention of the disease both on the local and national level, using the public health workers, specialists on the public health, sanitary-educational work, educators, teachers, scientific workers, representatives of public community and political figures.

All prophylactic programmes must be based upon the objective estimation of situation according to the data of diseases and results of sociological studies, conducted in different social groups of population. It is very important to take into account the peculiarities of the Russian mentality, traditions with predominance of spiritual categories, specific relation to the high feelings, exclusive value of family relation with the aim of exclusion of the negative reaction of the part of society, giving response to the propaganda of safe sex as "corruption" of youth.

Conclusion

In the Novgorod Center on prophylaxis and fight with AIDS and infectious diseases "Helper" the following methods of prophylactic works are implemented: conduction of the educational seminars on the issues of epidemiology, prophylaxis, treatment and social aspect of HIV infection; conduction of lectures, debates, round tables, discussions on the issues of HIV infection among pupils of senior forms of the secondary schools, professional-technical schools, technical schools, higher educational establishments; training of volunteers for prophylactic work, involvement of youth leaders, idols, former drug addicts to HIV problem; preparation of prophylaxis, based upon the principle of equality, or "peer-to-peer education"; conduction of tele- and radio-transmissions for population on HIV infection prophylaxis among different groups of population; preparation of information material on the different aspects of HIV infection problem and their distribution in the computer network.

The basic instrument of resistance to HIV epidemic in Russia presently is the priority national project "Health" in 2009-2012.

In Novgorod region the epidemic rise of HIV infection sickness rate, connected with the rapid HIV infection distribution among people using drugs, is still continuing. More frequently the HIV infection affects young people in the age from 15 to 30 years old, and in the last 2-3 years the increase of detection of patients of older age is observed.

The transit of epidemic into the new phase is observed – generalization: distribution in the socially favourable groups of population with activation of the sexual way of transmission, the increase of infecting the women and correspondingly the increase of children, born from HIV infected mothers is observed. The majority of these women have in anamnesis the injection drug addiction that leads to creation of the unfavourable families and big rate of abandoned children, deterioration of clinical examination and increase of the children's infection. In Novgorod region enough high frequency of HIV infection transmission from mother to child is observed, which as a result of intensification of the prophylactic work in this region, is essentially lower the indicators of the Russian Federation, but prevails such one in the countries of the Western Europe.

For reduction of HIV infection distribution in the Russian Federation it is necessary to implement prophylactic measures, giving the notable effect. The prophylactic measures, directed on the groups of population, which can be infected or can distribute HIV with the utmost

probability must be the most priority.

Conflict of interest: All authors declare no COI

Ethics: There is no ethical violation as it is based on voluntary anonymous interviews

Funding: Russian Humanitarian Fund (Project number – 14-16-53001).

Guarantor: Dr. Olga Vladimirovna Azovtseva will act as guarantor of this article on behalf of all co-authors.

REFERENCES

1. Belyakov N.A. Sexual way of HIV transmission in the epidemic development / N.A. Belyakov, T.N. Vinogradova // HIV infection and immune suppression, 2011. – V.3. – No.4. – P. 7-19.
2. Onishchenko G.G. HIV infection – the problem of mankind / Onishchenko G.G. // HIV infection and immune suppression, 2009. – V.1. – No.1. – P. 5-9.
3. Safren S., Wingood G., Altice F. Strategies for primary HIV prevention that target behavioral change // Clin.Infect.Dis. – 2007. – Vol. 45. – Suppl. – P.300-307.
4. Pokrovskii V.V., Ladnaya N.N., Sokolova E.V., Buravtsova E.V. . HIV infection. Information bulletin No. 36// The Federal Scientific-Methodological Center on Prophylaxis and Fight with AIDS, territorial management by the Federal Services on observation in the area of human rights of consumers and human prosperity, 2012. – 52 p.
5. Center for Disease Control and Prevention Revised recommendation for HIV testing of adults, adolescents, and pregnant women in health-care setting // MMWR Recommend. Rep. -2006. –Vol. 55. P.1-17.
6. Sharapova O.V., Sadovnikova V.N., Terent'eva Zh.V. Modern aspects of prophylaxis of HIV infection transmission from mother to child in the Russian Federation / Almanac "Infectious diseases 2006". – SPb; 2007. – P. 201-207.
7. Hillis S., Kuklina E., Akatova N. et al. Epidemiology of perinatal HIV transmission in St. Petersburg, Russia // XVII International AIDS Conference, 3-8 August 2008.—Mexico City. Abstr. MOPE0509.
8. Recommendations for use of antiretroviral drugs in pregnant HIV infected women for maternal health and interventions to reduce perinatal HIV transmission in the United States // US Centers for Disease Control and Prevention. July 8, 2008. 98 p.
9. Vyalkov A.I. Medical prophylaxis: modern technologies: guidance. – M.: Geotar-Media, 2009. – 231 p.
10. Coates Th., Richter L., Caceres C. HIV Prevention 3. Behavioural strategies to reduce HIV transmission: how to make them work better // Lancet. -2008. –Vol.372.-P.669-684.



HCRT Evaluation on H1N1 Pneumonia

¹Tushar Madhavrao Kalekar, ²Abhijit Mahaveer Patil, ³Amarjit Singh

¹Associate Professor, ²Associate Professor, ³Professor
Department of Radiology, Dr. DYPMC & RC, Sant Tukaram Nagar,
Pimpri, Pune, Maharashtra, India

ABSTRACT

We are presenting HRCT chest case study of 40 patients with laboratory proved H1N1 influenza A infection presenting with acute chest symptoms. Most common HRCT findings were multifocal ground glass opacities with consolidations in the peripheral portion. Ill-defined pulmonary nodules were found in few patients.

Keywords: Computed Tomography, HRCT, H1N1, Ground glass

Introduction

Influenza A viruses are an important cause of pandemic respiratory disease [1]. For most patients with this infection, chest radiograph is first radiological investigation and can show multiple air space opacities however can be normal or may not give adequate information because of poor respiratory efforts secondary to patients condition. Here high-resolution CT (HRCT) is important imaging modality of choice and gives adequate information and is also helpful in assessing complications and providing evidence of mixed pulmonary infections in patients not responding to therapy [2,3]. We are presenting a case study of HRCT findings of proved cases of H1N1 Influenza A infection during 2010 to 2012. Purpose of this article is to illustrate and describe the various CT manifestations of H1N1 viral infection.

Materials and Methods

Case selection

We performed retrospective analysis of 40 proved cases of H1N1 Influenza A pneumonia on the basis of clinical examination and positive throat swab (RT PCR assay). Patients ranged in age from 18 to 52, out of which 22 were female and 18 were male. Cases of H1N1 with superimposed bacterial pneumonia were excluded using clinical and laboratory criteria.

Address for correspondence

Dr. Tushar M. Kalekar, Flat 11, Suvarna Housing Society, B wing
Gagangarima complex, Behind Khadki Railway station Pune - 411020,
Maharashtra, India
Email : dr.tushar.kalekar@gmail.com

Received: 21. 08.15
Accepted: 02. 03.16

Imaging Technique

All patients were evaluated with CT scanner (Siemens, Somatom Definition AS, Erlangen German) Images were acquired in mediastinal and High resolution lung window algorithm using 1mm slice thickness with 10mm interslice gap.

Results

Clinical and Laboratory Findings

Most common clinical features for H1N1 virus infection at presentation are acute breathlessness, fever, cough, and headache. Throat swab (RT PCR assay) of all patients were tested positive for H1N1 influenza A. Chest radiograph of all patients showed some abnormality or raised its possibility

HRCT Findings

Out of 40 patients, nine patients did not show any pulmonary abnormality. Most common positive CT findings in patients with H1N1 infection are multifocal ground-glass opacities, areas of consolidation, or a mixed pattern of ground-glass opacities and areas of consolidation [Fig,1, 2, 3,4]. The abnormalities are frequently bilateral and peripheral subpleural location [fig 5] only in two cases opacities were peribronchovascular distribution. Figs. 7 Ill-defined parenchymal nodules with random distribution were seen in two patients [fig 6,8]. Parenchymal abnormalities did not show any zonal predominance or, more rarely, unilateral (Fig. 9). Patients with widespread consolidations have a more severe clinical course than those who do not [2]. Although none of these patterns is specific of H1N1 infection, the main patterns of disease that are most suggestive of H1N1 are scattered lung consolidations, ground-glass opacities, or

both in a peribronchovascular or sub pleural distribution. Strikingly pleural effusion and mediastinal lymphadenopathy is absent in all cases.

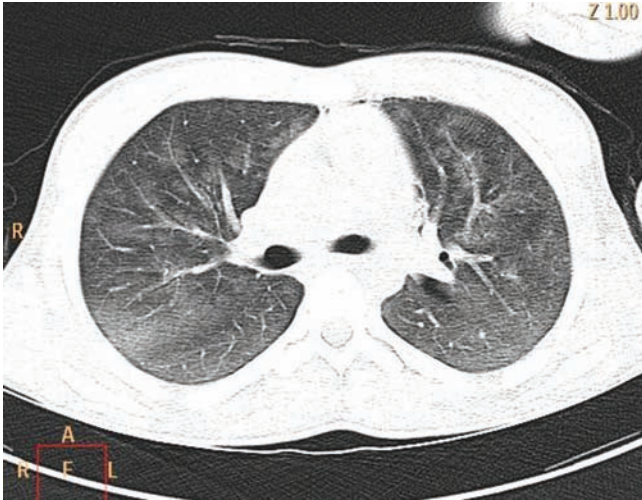


Fig.1: Diffuse bilateral ground glass opacities

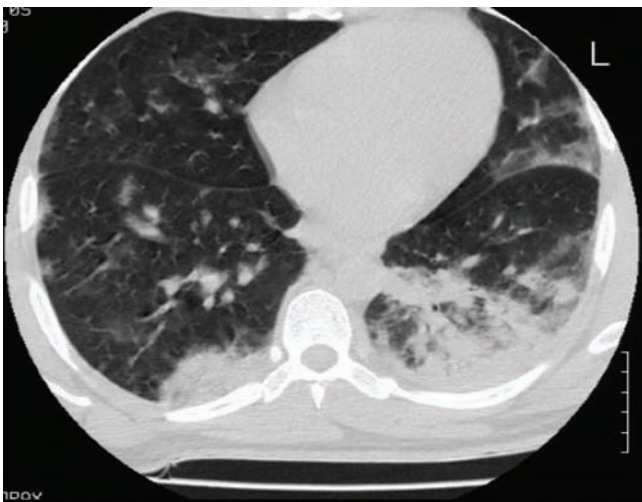


Fig.2: Bilateral multifocal consolidations and ground glass opacities in subpleural region

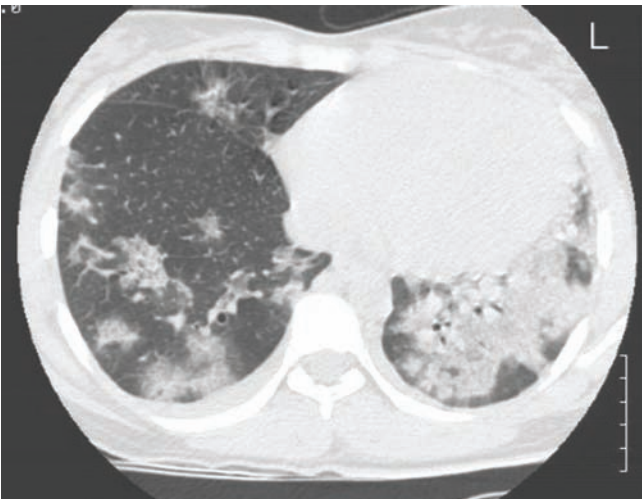


Fig.3 : Extensive patchy ground glass densities and consolidations

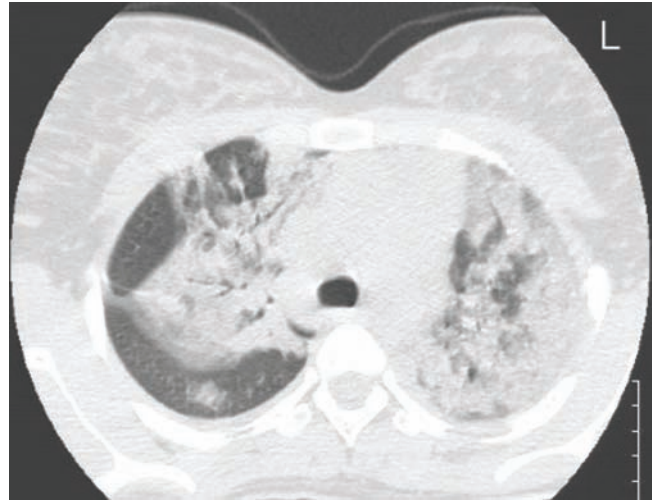


Fig.4: Extensive patchy ground glass densities and consolidations in upper lobes

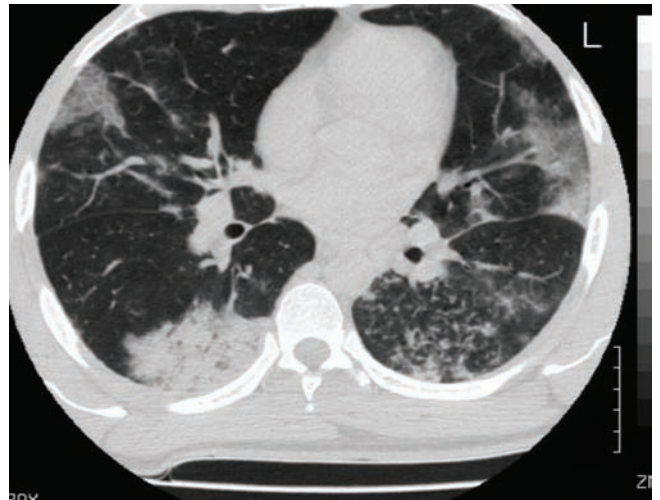


Fig.5: Subpleural and peripheral location of ground glass opacities and consolidations



Fig.6: Scattered ill-defined nodular densities in upper lobes

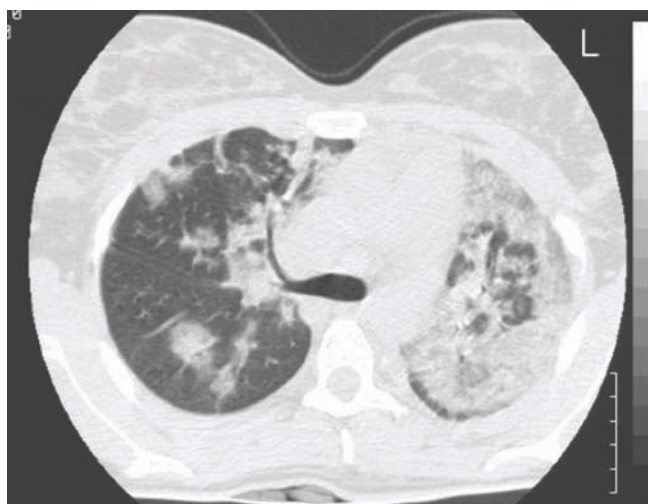


Fig.7: Coronal image showing multiple scattered nodular densities in bilateral lung parenchyma

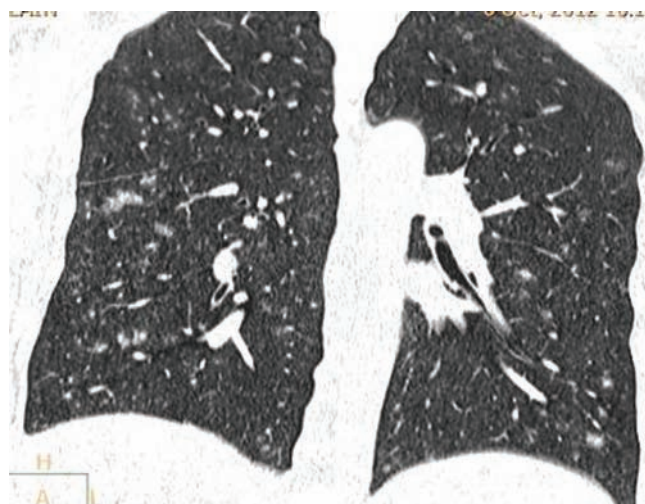


Fig 8: Few of the densities are peribronchovascular in distribution and predominant peripheral in location



Fig.9: Unilateral consolidation and ground glass opacities

Table 1. Age and sex wise distribution

Age	Male	Female	Total
0-10	0	0	0 (0 %)
10-20	1	4	5 (12.5 %)
20-30	4	3	7 (17.5 %)
30-40	6	8	14 (35 %)
40-50	3	4	7 (17.5 %)
50-60	4	3	7 (17.5 %)

Table 2 Incidence of detection on HRCT

Total	Throat swab positive	HRCT positive
40	40	31

Table 3 Incidence of positive HRCT findings

Mix ground glass and consolidations	Ground glass densities	consolidations	Nodules	Positive findings
12	14	5	2	Number
30	35	12.5	5	percentage

Discussion

This pattern of multifocal ground glass opacities with consolidation is commonly seen in other conditions like acute stage of cryptogenic organizing pneumonia, hypersensitivity pneumonitis, chronic eosinophilic pneumonia, other viral pneumonias, diffuse alveolar hemorrhage etc. [11]. So clinical findings and laboratory evidence of the infection when suspected is very important [2].

Another uncommon parenchymal finding is the halo sign, which is ground-glass opacities surrounding a consolidation, nodule, or mass [5]. Elicker et al. [5] reported that CT features associated with either large or small airways disease such as airway thickening or dilatation, centrilobular nodules [fig.11] and tree-in-bud opacities were frequent in their series of immunocompromised patients. Sometimes consolidations develop secondary to bacterial infections during course of the disease and radiological assessment becomes difficult [2]. However appearance of lobar, multilobar consolidations, cavitations and appearance of pleural effusion are important features which gives glue to the diagnosis. Here clinical course of the disease and follow up imaging is important. Consolidations and ground glass opacities secondary to H1N1 infection regress during convalescence [2]. Only two patients in the study showed multiple centrilobular nodules with branching and tree in bud appearance suggesting small airways involvement. These findings are previously described in a study by Elicker et al. [5] in immunocompromised patients.

Pulmonary injury may predispose individuals who become infected with H1N1 virus to the formation of cysts that may rupture, causing the formation of an extra alveolar air collection. The free air may dissect and rupture through the visceral pleura, causing pneumothorax, or may track centrally into the hila and mediastinum, causing pneumomediastinum] (Fig. 10). However, in most studies, chest CT with soft-tissue window settings displayed several notable negative findings including the absence of lymphadenopathy and pleural or pericardial effusions

Differential Diagnosis

HRCT findings of multifocal peripheral scattered areas of consolidation or ground-glass opacities are not specific for influenza pneumonia [2]. Other viral pneumonias, cryptogenic organizing pneumonia (COP, chronic eosinophilic pneumonia (CEP), acute stage of hypersensitivity pneumonitis, parasitic infections like *Pneumocystis carinii* pneumonia in immunocompromised patients. Clinical history, symptoms,

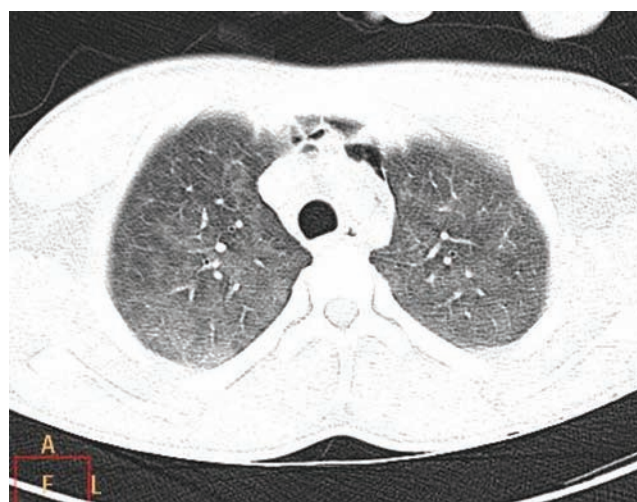


Fig.10: Diffuse ground glass opacities with small pneumomediastinum



Fig.11: Diffuse ground glass opacities with centrilobular nodules

occupational history and laboratory results are very important [11].

Sudden onset of infectious symptoms in H1N1 pneumonia is the most important parameter for differentiating H1N1 infection from COP and CEP. Other diseases most likely to be confused with H1N1 infection are other bacterial, atypical, fungal and viral infections. Clinical and laboratory data and the presence of unusual imaging findings seen in H1N1 infection, such as pleural effusion, lymphadenopathy and lobar consolidation, break down can help in establishing the correct diagnosis [13]. Although the CT findings of H1N1 infection frequently overlap with those of other infections, a pattern of extensive or diffuse ground-glass opacities and consolidations, mainly when in a peribronchovascular or subpleural distribution, can be highly correlated to H1N1 infection [7]. Less typical tomographic presentations have a broad differential diagnosis. The finding of ground-glass opacities on HRCT in patients with AIDS is highly related to *Pneumocystis carinii* pneumonia and cytomegalovirus pneumonia..

H1N1 infection should also be included in the differential diagnosis of pulmonary infections that cause ground-glass opacities in patients with AIDS [14]. Lymphocytic interstitial pneumonia and nonspecific interstitial pneumonia may present as groundglass opacities on HRCT [15].

Conclusion and Summary

Multifocal ground glass peripheral ground glass opacities with or without consolidation or nodules is a common HRCT finding of pulmonary H1N1 infection which is non specific for the diagnosis. However, when associated with clinical and laboratory data, imaging findings can be of great value in staging disease, assessing complications, and following up patients, especially in cases with a severe course.

Conflict of interest:	All authors declare no COI
Ethics:	There is no ethical violation as it is based on voluntary anonymous interviews
Funding:	No external funding
Guarantor:	Dr. Tushar M. Kalekar will act as guarantor of this article on behalf of all co-authors.

References

1. Dr R T Borse, Dr D B Kadam Dr, S A Sangle, Dr A Basavraj Comparison Of Demographic, Clinical, Radiological Characteristics & Comorbidies In Survived & Nonsurvived Adult Patients Admitted In ICU With Confirmed Diagnosis Of Influenza A H1N1, ISSN June 2010;6:2277-8179.
2. Edson Marchiori1, Gláucia Zanetti1, Giuseppe D'Ippolito, et al. Swine-Origin Influenza A (H1N1) Viral Infection: Thoracic Findings on CT. *AJR*: June 2011, 196:723-728.
3. Marchiori E, Zanetti G, Hochhegger B, et al. High resolution Computed tomography findings from adult patients with influenza A (H1N1) virus-associated pneumonia. *Eur J Radiol* 2010; 74:93-98.
4. Gill JR, Sheng ZM, Ely SF, et al. Pulmonary pathologic findings of fatal 2009 pandemic influenza A/H1N1 viral infections. *Arch Pathol Lab Med* 2010; 134:235-243.
5. Elicker BM, Schwartz BS, Liu C, et al. Thoracic CT findings of novel influenza A (H1N1) infection in immunocompromised patients. *Emerg Radiol* 2010; 17:299-307.
6. Lee CW, Seo JB, Song JW, et al. Pulmonary complication of novel influenza A (H1N1) infection: imaging features in two patients. *Korean J Radiol* 2009; 10:531-534.
7. Ajlan AM, Quiney B, Nicolaou S, Müller NL. Swine-origin influenza A (H1N1) viral infection: radiographic and CT findings. *AJR* 2009; 193: 1494-1499.
8. Mauad T, Hajjar LA, Callegari GD, et al. Lung pathology in fatal novel human influenza A H1N1) infection. *Am J Respir Crit Care Med* 2010; 181:72-79.
9. Guo HH, Sweeney RT, Regula D, Leung AN. Best cases from the AFIP: fatal 2009 influenza A (H1N1) infection, complicated by acute respiratory distress syndrome and pulmonary interstitial emphysema. *RadioGraphics* 2010; 30:327-333.
10. Agarwal PP, Cinti S, Kazerooni EA. Chest radiographic and CT findings in novel swine-origin influenza A (H1N1) virus (S-OIV) infection. *AJR* 2009; 193:1488-1493.
11. Ketai LH. Conventional wisdom: unconventional virus. *AJR* 2009; 193:1486-1487.
12. Marchiori E, Zanetti G, Mano CM, Hochhegger B, Irion KL. Follow-up aspects of influenza A (H1N1) virus-associated pneumonia: the role of high-resolution computed tomography in the evaluation of the recovery phase. *Korean J Radiol* 2010; 11:587.
13. Aviram G, Bar-Shai A, Sosna J, et al. H1N1 influenza: initial chest radiographic findings in helping predict patient outcome. *Radiology* 2010; 255: 252-259.
14. Marchiori E, Zanetti G, Hochhegger B, Iron KL. High-resolution computed tomography findings in a patient HIV-positive with swine-origin influenza A (H1N1) virus-associated pneumonia. *Br J Radiol* 2010; 83:179.
15. Marchiori E, Müller NL, Soares Souza A Jr, Escuissato DL, Gasparetto EL, Franquet T. Pulmonary disease in patients with AIDS: high-resolution CT and pathologic findings. *AJR* 2005; 184: 757-764.



Fetal Kidney Length as a parameter for determination of Gestational Age in Second Trimester of Pregnancy

Neelu Luther, Patnaik VVG, Nidhi Puri, Amit Mittal

Department of Anatomy,
MMU University, Mullana, Ambala, Haryana, India

ABSTRACT

- Objective:** To evaluate application and accuracy of foetal kidney length measurement in determining the gestational age of foetus in second trimester of pregnancy.
- Design:** Prospective study.
- Methods:** The present study evaluated the role of Foetal Kidney Length in determining the gestation age with the study population of 101 pregnant women with single ton uncomplicated pregnancies who attended the outdoor patient department of Radiology at the MMIMSR, Ambala for routine ultrasound foetal biometrics like Bi-parietal Diameter (BPD), Abdominal Circumference (AC), Femur Length (FL), Head Circumference (HC). Foetal kidney lengths (FKL) were measured in second (20-24 weeks) trimester.
- Results:** Kidney Length predicted gestational age with precision when combined with other foetal biometrics – BPD, AC, HC, FL.
- Conclusion:** Foetal Kidney length when combined with other foetal parameters increases the efficacy of gestational age
- Key words:** Gestational age, Foetal Kidney Length, Pregnancy

Introduction

Accurate Gestational Age (GA) estimation is very important to an obstetrician for diagnosis of growth disorders, in assessment of wrong dates or forgotten dates and timing of delivery either by induction or caesarean section. It is particularly important in high risk pregnancies. Wherein some cases early termination may become necessary as soon as foetus becomes mature. GA estimation is also a prerequisite to interpret certain tests and to planning of various forms of foetal therapy. Failure in estimating GA accurately can result in unnecessary induction, dysfunctional labour, operative delivery, iatrogenic prematurity or postmaturity, false interpretation of tests and delay or failure of foetal therapy, thereby increasing perinatal morbidity and mortality. GA has traditionally been estimated from the date of first day of last menstrual period (LMP). The fallacy in this method

is that the time of ovulation in relation to the menstrual cycle varies greatly both from cycle to cycle and individual to individual. About 10-45% of pregnant women cannot provide useful information about their LMP and 18% of women with certain menstrual dates have significant differences between menstrual and ultrasonography dating [1].

Since the introduction of diagnostic ultrasound, more reliable methods to date the pregnancy have been developed. In the first term, these are gestational sac diameter and volume and crown rump length (CRL) measurement [2]. In the second trimester, the most commonly used biometric indices for dating pregnancies are biparietal diameter (BPD) and femur length (FL) [3] and other used parameters are transverse cerebellar diameter, [4] scapular measurement, [5] foetal kidney length, [6] and foetal renal volume [7]. Foetal kidney is easy to identify and measure in the late second and third trimesters and there is a strong correlation between gestational age and foetal kidney length [8].

Hence, the present study is undertaken to evaluate the reliability of Foetal Kidney Length for estimation of gestational age (GA) in second trimester (20-24 weeks) and also to find out the effect on gestational age if measured by Foetal Kidney alone or when it is combined

Address for correspondence

Neelu Luther, Department of Anatomy, MMU University, Mullana, Ambala, Haryana, India
Email: anilluther@gmail.com

Received: 18. 01.17
Accepted: 22. 03.17

with other biometric indices such as BPD, FL, AC and HC.

Materials and Methods

The study was carried out, after obtaining informed consent, on 101 women with singleton uncomplicated pregnancies attending the outdoor patient department (OPD) for routine ultrasound foetal biometry, in the Department of Radio diagnosis, MMIMSR Medical College, Mullana, Ambala. This study included only those uncomplicated pregnant women having single live normal foetus and those women who had multiple pregnancies and suffered from eclampsia, pre-eclampsia and chronic hypertension, diabetes mellitus and intrauterine growth retardation were excluded from the study.

The selective foetal biometric indices (BPD, FL, HC, and AC) were measured along with Foetal Kidney Lengths (FKL) by using Ultrasound machine HD-11xE (Philips Medical systems, USA) with convex array transducer in the second trimester between 20-24 weeks. The maximum renal length was measured from the upper pole to lower pole of both the kidneys in the longitudinal section of the foetus in the sagittal plane. The data was then analysed using software SPSS Version 21. To predict GA by using FKL alone and by other foetal biometric indices, Univariate and multivariate Linear Regression analysis was performed based on Ultrasonography. GA was taken as dependent variable whereas foetal

biometrics indices as independent variables.

New models were constructed including BPD, HC, FL, AC& KL (average) in various combinations. The best model was determined based on Akaike Information Criterion (AIC), r^2 (Coefficient of Determination) & Std. Error of Estimate in days was also calculated. The Left Kidney length and the Right Kidney Length were compared between 20-24 weeks of gestation based on USG. Its significance was assessed by usage of paired T-test. Also, the coefficient of correlation between Gestational age (according to USG) and foetal biometric parameters including MKL was also calculated.

Results

The study involved 101 women with singleton uncomplicated pregnancies in between 20-24 weeks of gestation. 9 women out of 101 could not remember their date of Last Menstrual Period (LMP), however reported of regular cycles. These women underwent standard ultrasound foetal biometrics and kidney length measurement. During the study it was observed that FKL roughly corresponds to the age of gestation with left kidney slightly longer than right.

Table 1 shows that significant difference exists between the Left & Right Kidney Length at 21 weeks of gestation with p value less than 0.0005 and same for 22& 23 weeks of gestation when calculated according to USG.

Table 1 : Comparing LKL with RKL at different period of gestation in weeks according to USG

	LK (mm)	RK (mm)	Difference (mm)	Paired T Test	KL
GA weeks	Mean \pm SD	Mean \pm SD			Mean \pm SD
20	19.87 \pm 2.27	19.13 \pm 2.33	-0.746	0.6131	19.5 \pm 2.19
21	20.22 \pm 2.14	19.65 \pm 1.96	-0.567	0.0306	19.94 \pm 1.94
22	22.02 \pm 5.79	21.05 \pm 4.79	-0.971	0.0113	21.54 \pm 5.24
23	22.41 \pm 3.02	21.36 \pm 2.51	-1.045	0.0009	21.89 \pm 2.75
24	22.84 \pm 2.5	22.14 \pm 2.48	-0.700	0.3644	22.49 \pm 2.31

LK - Left Kidney Length, RK - Right Kidney Length, KL - Mean of Left Kidney Length & Right Kidney Lengths.

Table 2 : Univariate Regression on GA according to USG

	R Square	Std. Error of the Estimate	Regression Equation	P value	correlation coefficient
BPD	.655	5.156	77.4 + 1.43 * BPD2	.000	0.809
HC	.738	4.491	49.15 + 0.54 * HC2	.000	0.859
FL	.657	5.137	93.71 + 1.58 * FL2	.000	0.811
AC	.658	5.133	71.24 + 0.48 * AC2	.000	0.811
KL	.114	8.259	133.5 + 0.89 * MKL2	.001	0.337

BPD - Biparietal Diameter, HC - Head Circumference, FL- Femur Length, AC - Abdominal Circumference, KL - Average of LK & RK

Table 3 : Multivariate regression on GA on USG

	Residual sum of squares	AIC	Regression Equation	R Square	Std. Error of the Estimate
KL, BPD	2473.728	135.5198996	$72.68 + 0.39 * MKL + 1.36 * BPD$	.675	5.024
KL,HC	1971.540	126.4536334	$48.23 + 0.16 * MKL + 0.53 * HC$	.741	4.485
KL,FL	2549.521	136.7257159	$90.64 + 0.25 * MKL + 1.52 * FL$	.665	5.101
KL,AC	2593.392	137.4073887	$70.4 + 0.12 * MKL + 0.47 * AC$	.660	5.144
KL,HC,BPD	1438.433	115.8573576	$46.5 + 0.16 * MKL + 0.35 * HC + 0.68 * BPD$	.811	3.851
KL,HC,FL	1475.035	116.8613338	$55.07 + 0.09 * MKL + 0.35 * HC + 0.74 * FL$	.806	3.900
KL,HC,AC	1516.522	117.9696045	$45.38 + 0.03 * MKL + 0.36 * HC + 0.22 * AC$	.801	3.954
KL,HC,BPD,FL	1179.826	109.9387755	$52.06 + 0.1 * MKL + 0.26 * HC + 0.53 * BPD + 0.56 * FL$	.845	3.506
KL,HC,BPD,AC	1149.535	108.899578	$44.44 + 0.05 * MKL + 0.24 * HC + 0.58 * BPD + 0.18 * AC$	.849	3.460
KL,HC,BPD,AC,FL	984.886	104.7230482	$49.3 + 0.02 * MKL + 0.18 * HC + 0.47 * BPD + 0.46 * FL + 0.15 * AC$	.871	3.220

KL- Average of Left and right kidney acc to Usg, BPD- Biparietal Diameter, HC- Head Circumference, FL- Femur Length, AC- Abdominal Circumference, AIC- Akaike Information Criterion

Table 2 shows that when individual variables were analysed separately based on USG, the Head Circumference (HC) was the most accurate parameter with standard error of estimate (4.491) followed by AC with standard error of estimate (5.133). MKL was the most inaccurate parameter with std error of estimate (8.259) in second trimester according to USG.

Table 3 Shows multivariate regression analysis of GA based on USG. The derived model of GA prediction by combination of various Foetal Biometrics Indices based on USG shows accuracy of precision of Gestational Age estimation is best when MKL is combined with other gold standard parameters (BPD, HC, AC, FL) with SE of estimation of just 3.22 days.

Discussion

Accurate dating of pregnancy is a challenge for obstetrician till the present day especially in women with unreliable menstrual history. Failure to date the pregnancy accurately can result in the iatrogenic prematurity or post maturity, both of which can cause increased peri natal mortality and morbidity. Earlier the gestational age was calculated by knowing the first day of last menstrual period in a regular (28 days cycle) or by physical examination. These methods of dating pregnancy are not considered to be reliable anymore. Women with certain clinical conditions like oligohydramnios, polyhydramnios and women who could not exactly remember their LMP, these methods were associated with erroneous estimation of gestational age. Introduction of diagnostic ultrasound has taken obstetrics to the new horizons to the fact that gestational age could now be calculated with more accuracy thus resulting considerable decrease in perinatal morbidity and

mortality [9].

Gestational age is calculated with precision by measuring ultrasonic foetal parameters like BPD, AC, HC and FL in 2nd trimester. In certain circumstances these parameters may not be reliable like femur length in achondroplasia, similarly BPD and HC becomes unreliable in altered skull growth like macrocephaly, microcephaly etc. [6,10]

Taking into consideration the disparities of the scan, various non-traditional methods are under study. Foetal kidney length is one such non-traditional parameter which is easy to measure and correlates well with gestational age especially in unbooked women. More over kidney length is one such parameter which is not affected by growth variations. However in practice, all these are not common methods of dating pregnancies. There is therefore a need to investigate a method of dating pregnancies that is simple, easy to define and reproducible. Although kidney size, as for all foetal organs, is affected by growth variations, these appear to predominantly affect only the anterior-posterior and transverse diameters [11].

The present study evaluated the role of foetal kidney length measurement in the estimation of gestational age alone and when combined with and compared with that of routinely used gold standard parameters like BPD, FL, AC and HC in second trimester 20-24 weeks. In all the cases the foetal kidney length was easily visualised with a little manipulation of transducer position and angle insonation relative to kidney plane, which is in agreement with Konje et al. [12]

Foetal parameters like BPD, FL, AC and HC were measured in 101 cases along with both kidney lengths in 2nd trimester. 92 women out of 101 were sure of their LMP.

The left kidney length when compared with that of right kidney by using paired T test showed a significant variation between the left & right kidneys with p value <0.0005 (Table 1). It was also observed that the left kidney length was significantly longer than the right kidney in the 2nd trimester (Table 1). These findings were in agreement to the studies done earlier which also found that the left kidney was longer than the right [3].

All four biometric indices were measured in 101 cases along with both KL. There was increase in Foetal Kidney Length as the gestation increases indicating significant correlation between gestational age and mean foetal Kidney Length. [13]

In our study the equations derived from linear regression analysis when the individual biometric parameters (variables) were analysed separately. The most accurate parameter was HC with a standard error (SE) of 4.491, whereas it was highest for MKL with the SE of 8.259 days (Table 2).

We also found that the derived models of GA prediction by combination of various biometric indices showed that the estimation of the best GA can be achieved by combining AC, BPD, FL and HC with a SE of 3.460 days and the accuracy of precision of estimation of gestational age increases when MKL (Mean Kidney Length) is combined to the above model with SE of prediction of just 3.22 days.

Conclusion

Hence it is concluded that although there is a strong correlation between the Kidney Length and gestational age. In this study however FKL was not found to be reliable parameter when used alone for estimation of gestational age between 20-24 weeks but its accuracy increases only when it is combined with the other four gold standard parameters. Therefore, foetal kidney length can be used as a tool for estimating foetal gestational age in the second trimester only when used along with the other parameters.

Conflict of interest: All authors declare no COI

Ethics: There is no ethical violation as it is based on voluntary anonymous interviews

Funding: No external funding

Guarantor: Dr Neelu Luther will act as guarantor of this article on behalf of all co-authors.

References

1. Kaul I, Menia V, Anand KA, Gupta R. Role of Fetal Kidney Length in Estimation of Gestational Age. *JK Science* 2012;14(2):65.
2. Kumara K, Lalwanib R, Babu R, Aneja S, Malik A. Ultrasonographic estimation of fetal gestational age by fetal kidney length. *Journal of the Anatomical Society of India* 2013; 62 : 33-6.
3. Egley CC, Seeds JW, Cefalo RC. Femur length versus biparietal diameter for estimating gestational age in the third trimester. *Am J Perinatol* 1986;3:77-9.
4. Chavez MR, Ananth CV, Smulian JC, et al. Fetal transcerebellar diameter measurement with particular emphasis in the third trimester: a reliable predictor of gestational age. *Am J Obstet Gynecol* 2004;191:979-84.
5. Dilmen G, Turhan NO, Toppare MF, et al. Scapula length measurement for assessment of fetal growth and development. *Ultrasound Med Biol* 1995;21:139-42.
6. Ansari SM, Saha M, Paul AK, et al. Ultrasonographic study of 793 foetuses: measurement of normal foetal kidney lengths in Bangladesh. *Australian Radiology* 1997;41:3-5.
7. Fauchonet D, Benzie RJ, Mein B, et al. Three-dimensional ultrasound estimation of fetal renal volumes in the second and third trimesters. *ASUM Ultrasound Bulletin* 2005;8:27-8.
8. Kansaria JJ, Parulekar SV. Nomogram for foetal kidney length. *Bombay Hospital J* 2009;51:155-62.
9. Kumar K, Lalwani R, Babu R, Aneja S, Malik A. Ultrasonographic estimation of fetal gestational age by fetal kidney length. *J Anat Soc India*. 2013;62:33-6
10. Gupta K. Measurement of fetal parameters. In: *Ultrasound in Obstetrics and Gynecology*. Malhotra N, Kumar P, Dasgupta S, Rajan R, editors. 3rd ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd; 2001. p.93.
11. Kansaria JJ, Parulekar SV. Nomogram for foetal kidney length. *Bombay Hospital Journal*. 2009;51(2):155-61.
12. Konje JC, Abrams KR, Bell SC, Taylor DJ. Determination of gestational age after the 24th week of gestation from fetal kidney length measurements. *Ultrasound Obstet Gynecol*. 2002 Jun;19(6):592-7.
13. Cohen HL, Cooper J, Eisenberg P, Mandel FS, Gross BR, Goldman MA et al. Normal length of fetal kidneys: sonographic study in 397 obstetric patients. *Am J Roentgenol*. 1991 Sep; 157(3):545-48.



Randomized Controlled Study to Evaluate Comparative Efficacy of Intrathecal Clonidine and Dexmedetomidine as Adjuvants to Hyperbaric Bupivacaine for Spinal Anaesthesia for Lower Limb Surgeries

Hardeep Bariar, Manjeet Singh, Sahil Garg, Parmod Kumar

Department of Anaesthesia and Intensive Care, GMC, Patiala, Punjab, India

Abstract

Background: Various adjuvants are being used with local anaesthetics for prolongation of intra operative and post-operative analgesia. Dexmedetomidine, the highly selective alpha-2 adrenergic agonist is a new neuraxial adjuvant gaining popularity.

Setting and Design: The study was conducted in prospective, double blind manner. It included 90 ASA grade I and II patients undergoing lower limb surgery under Spinal anaesthesia, after approval from hospital ethical committee with written and informed consent of patients.

Material and Method: The patients were randomly divided into 3 groups (30 each) Group BS received 12.5 mg hyperbaric bupivacaine with normal saline. Group BC received 12.5 mg hyperbaric bupivacaine with 30 mcg clonidine and Group BD received 12.5 mg hyperbaric bupivacaine with 5mcg dexmedetomidine. The onset time to reach peak sensory and motor level, the regression time of sensory and motor block, hemodynamic changes and side effects were recorded.

Results: Patients in group BD had significantly longer sensory and motor block duration than patients in group BC and BS. The mean time of two segment sensory block regression was 146.67 minutes in BD, 127 minutes in group BC and 102minutes in BS groups respectively ($p > 0.0001$). The regression time of motor block to reach modified Bromage zero (0) was 273.33 minutes in BD, 198.67 minutes in BC and 160.50minutes in BS groups respectively ($p > 0.0001$). Dexmedetomidine group showed significantly less and delayed requirements of rescue analgesia.

Conclusion: Intrathecal dexmedetomidine is associated with prolonged sensory and motor blockade, haemodynamic stability and reduced demand of rescue analgesia in 24 hours as compared to clonidine and hyperbaric bupivacaine without any serious side effects.

Keywords: alpha-2 adrenoreceptor agonist, hyperbaric bupivacaine, clonidine, dexmedetomidine and spinal anaesthesia.

Introduction

Subarchanoid blockade is the most commonly used regional anaesthesia technique for lower limb surgery. Over the last decade, there has been considerable revival of interest in the use of adjuncts to local anaesthetic agents in central neuraxial block with the aim of prolonging the duration of sensory and motor block and reducing post-operative analgesia requirement. However, their use is thwarted either due to the adverse effects of

adjuvants or unreliable post-operative analgesia.

Most of the clinical studies about intrathecal alpha-2 adrenergic agonists are related to clonidine [1]. Dexmedetomidine, a highly selective alpha-2 adrenergic agonist has evolved as a panacea for various applications in procedures in perioperative and critical care settings [2]. It is also emerging as a valuable adjunct in regional anaesthesia and analgesia, where studies have built the evidence for its safe use in central neuraxial blocks [3]. Based on earlier human studies, it is hypothesized that intrathecal 5mcg Dexmedetomidine would produce more post-operative analgesic effects with hyperbaric bupivacaine in spinal anaesthesia with minimal side effects [4-7].

In view of few evidences [4-7] of dexmedetomidine

Address for correspondence

Dr. Hardeep Bariar, Department of Anaesthesia and Intensive Care,
GMC, Patiala, Punjab, India
Email: drhardeepbariar@gmail.com

Received: 14.07.17

Accepted: 21.06.18

efficacy as an adjuvant to hyperbaric bupivacaine in spinal anaesthesia, we strived to explore its usefulness and also compare this new alpha-2 adrenergic agonist with the previously established and widely used adjunct clonidine, for patients for lower limb surgery.

Material & Method

Pre-operative

After getting informed consent, 90 patients of either sex belonging to ASA grade I and II and scheduled for lower limb surgery under subarachnoid block were enrolled in this prospective randomized and double blind study. To calculate the sample size, a power analysis of $\alpha = 0.05$ and $\beta = 1.00$ showed that 30 patients were needed per study group to detect an increase of 30 min. difference between the median duration of spinal sensory block between the groups. Data was expressed as means, standard deviation (SD), medians, ranges or numbers and percentages.

Patients with contraindications for regional anaesthesia, history of any co-existing disease like Ischaemic heart disease, hypertension, impaired renal functions, rheumatoid arthritis and severe liver disease were excluded from the study.

All patients were examined and investigated a day prior to surgery and were familiarized with visual analogue scale (VAS) and its use for measuring the post-operative pain.

They were advised fasting for 6 hours and received Alprax 0.5 mg a night before and 0.25 mg on the day of surgery.

Intraoperative

In operation theatre base line parameters like ECG, pulse oximetry, non-invasive blood pressure were recorded and monitoring was initiated. Intravenous access was secured and all the patients were preloaded with ringer lactate 10ml/kg. These patients were randomly assigned, using sealed envelope technique to either of three groups in double-blind manner.

The study solutions were prepared in 5 ml syringe by an anaesthesiologist who then handed them over in a coded form to the attending anaesthesiologist blinded to the nature of the drug given to him/her. Subarachnoid block was administered at the L 2-3 or L 3-4 vertebral level using 23G Quincke spinal needle with patients in sitting position, under all aseptic precautions. Patients were made supine following the block. The anaesthesiologist performing the block recorded the intraoperative data.

The onset and duration of sensory block, highest level attained, time to reach the highest dermatome, motor

Table 1: Groups for Study

GROUP BS	Intrathecal(I/T) hyperbaric bupivacaine 12.5 mg(2.5 ml) + Preservative Free Normal Saline(NS) (0.5 ml)
GROUP BC	Intrathecal(I/T) hyperbaric bupivacaine 12.5 mg(2.5 ml) + Clonidine 30mcg (0.2ml) + Preservative Free Normal Saline(NS) (0.3 ml)
GROUP BD	Intrathecal(I/T) hyperbaric bupivacaine 12.5 mg (2.5 ml) + Dexmedetomidine 5mcg (0.05ml) + Preservative Free Normal Saline(NS) (0.45 ml)
	BS - Bupivacaine Saline
	BC - Bupivacaine Clonidine
	BD - Bupivacaine Dexmedetomidine

block onset, time to complete motor block, recovery and duration of spinal anaesthesia were recorded. Onset of sensory block was defined as a time between injection of intrathecal anaesthetic and absence of pain at T8 dermatome assessed by sterile pinprick every 2 minutes till T8 dermatome was reached. The highest level of sensory block was evaluated by pinprick at midclavicular line anteriorly every 5 minutes for 20 minutes after injection and thereafter every 15 minutes.

Duration of sensory block was defined as a time of regression of 2 segments in maximum block height, evaluated by pinprick. Motor level was assessed according to modified Bromage score [9].

- **Bromage 0** - patient can move hip, knee and ankle
- **Bromage 1** - unable to move hip, but can move knee and ankle.
- **Bromage 2**- unable to move hip and knee but can move ankle.
- **Bromage 3**- unable to move hip, knee and ankle.

Complete motor block recovery when Bromage is 0.

Duration of sensory block was defined as time of regression of 2 segments in maximum block height, evaluated by pin prick. Duration of spinal anaesthesia was defined as the period of spinal injection to first occasion when patient complained of pain in post - operative period.

Surgery was started, achieving adequate sensory height (T8), vitals were recorded 5 minutes before intrathecal (I/T) injections at 5, 10,15,20,25 minutes interval and then every 15 minutes subsequently during intraoperative period. Pain score using VAS was recorded 5 minutes before intrathecal injections and start of surgery in subsequently, every 15 minutes till surgery was completed and thereafter VAS was assessed in post-

operative period. Intravenous fluids were given to maintain the blood pressure. Hypotension was defined as a fall in systolic blood pressure by 30% from base line and was treated with intravenous bolus of mephenteramine or crystalloid fluids. Heart rate less than 50 beats/minute was treated with 0.6 mg intravenous atropine sulphate. The incidence of nausea, vomiting pruritis and sedation were recorded. De Kock sedation scale was used [10].

- 1-patient is somnolent but responding to verbal commands
- 2-patient is somnolent but not responding to verbal commands
- 3-patient is somnolent, not responding to verbal commands or manual stimulation.

Postoperative

Motor block recovery (modified bromage score of 0 and sensory block regression were assessed every 15 minutes after completion of surgery till the time of regression of two segments in maximum block along with vital signs and VAS score. Any patient showing VAS more than 3 was administered supplemental dose of tramadol 50mg. Amount required by the patient in next 24 hours was recorded in all the groups. Descriptive statistic was done for all data and suitable statistical tests for comparison was done. Categorical variables (sex, nausea/vomiting, use of additive analgesia, hypotension and bradycardia) were analysed with Chi-square test and Fisher exact test. Statistical significance was taken as p value < 0.05. The observations were depicted in tables. Continuous co-variates (age and duration of surgery) were compared using analysis of variance (ANOVA).

Observations

In this study age, sex, height, weight, ASA grade of patients were comparable among all the groups & statistically insignificant and p= 0.19.

Table 2: Mean time of onset of sensory block (mins.)

	Mean	SD
BS	6.8	1.355
BC	4.92	1.104
BD	4.45	1.12
Significance	P value <0.05 (Significant)	

Table 3: Mean time of onset of motor blockade (mins.)

	Mean	SD
BS	9.17	2.96
BC	9.83	3.59
BD	9.67	3.20
Significance	P value >0.05 (Nonsignificant)	

Table 4: Mean duration of sensory block (mins.)

	Mean	SD
BS	102.38	17.16
BC	127	21.84
BD	146.67	20.57
Significance	P value = 0.0001 (significant)	

BS had statistically significant shorter duration, when compared to BC & BD groups.

BC & BD were comparable with statistically no difference between the two.

Table 5: Mean duration of motor block (mins.)

	Mean	SD
BS	160.50	19.88
BC	198.67	26.39
BD	273.33	24.58
Significance	P value < 0.0001 (Highly significant)	

Duration of motor blockade was prolonged in BD group as compared to BS & BC. BS had a significant shorter duration of motor block as compared to BC & BD. Groups BC & BD were however comparable.

Table 6: Mean time of rescue analgesia (mins.)

	Mean	SD
BS	160.46	11.87
BC	242.33	54.21
BD	290.01	40.30
Significance	P value = 0.0001 (significant)	

Time for analgesia request was earlier in BS as compared to BC & BD and this was statistically significant with p value 0.0001. Prolonged duration of analgesia with significantly delayed time of rescue analgesia was observed in group BD whereas BS & BC was statistically insignificant.

Trends in intraoperative hemodynamic parameters among subjects in different groups.

HEART RATE

During intra-operative period there was no statistical significant difference in HR in any of the groups with p value > 0.05 at all points of time. In post-operative period too, no statistically significant difference was seen in any of the groups and all groups were comparable.

SYSTOLIC BLOOD PRESSURE (SBP) / MEAN ARTERIAL PRESSURE (MAP)

No statistically significant difference in pre-operative MAP in all groups and it remained comparable at all times intra-operatively & post-operatively too.

SpO₂

There was no statistically significant difference in intra-operative and post-operative subjects of all groups.

All patients had a sedation score of 1 i.e. were somnolent but responded to verbal commands. Hence, all groups were comparable with regard to post-operative sedation.

No patient had pruritis at anytime intra/post-operatively.

VAS SCORE

VAS score was comparable with p value < 0.05 and no patient required intra-operative rescue analgesia.

At ½ hr, BS group patients had a higher VAS score as compared to BC & BD groups.

At 1, 1.5, 3 hrs, BS group had statistically significant higher VAS score as compared to BC & BD groups. At all points group BD had a minimal Vas score.

Discussion

Since most of the studies have compared the use of dexmedetomidine as an adjuvant to hyperbaric bupivacaine, we have compared the onset & duration of sensory and motor blockade, hemodynamic changes, total 24 hrs rescue analgesic requirement of 5 mcg of dexmedetomidine with 30 mcg of clonidine when added as adjuvants to hyperbaric bupivacaine for spinal anaesthesia.

In our study, in BD group we observed longer duration of both sensory and motor block, stable hemodynamic condition, good patient satisfaction. Findings were same as observed by Al-Mustafa et.al who studied the effect of dexmedetomidine 5 and 10 mcg doses with bupivacaine in urological procedures and found that dexmedetomidine prolongs the duration of spinal anaesthesia in dose dependent manner [6].

The mechanism by which intrathecal α_2 adrenergic agonist prolong the sensory and motor block of Local Anaesthetics is spectacular. Local anaesthetics act by blocking sodium channels and α_2 adrenergic agonists act by binding to the pre-synaptic C fibers and post synaptic dorsal horn neurons [4,5,11]. They produce analgesia by decreasing the release of C fiber transmitters and by hyperpolarisation of post synaptic dorsal horn neurons. The prolongation of motor block by these agents may also be because of this reason.

A lot of clinical experience in the use of intrathecal clonidine has been in use [19-22] and thus there has been a need to clinically study intrathecal dexmedetomidine to prove its efficacy, safety and suitable dose for supplementation to spinal local anaesthesia. In our study the dose of dexmedetomidine was selected on previous human studies wherein no neurotoxic effects have been observed [4-6].

Time of onset of Sensory block (Table 2)

It was observed that the time of onset of sensory block was early in BC & BD groups with 6.8 mins SD 1.35 in BS group, 4.92 mins SD 1.104 in BC group and 4.45mins SD 1.12 in BD group respectively. Strebel S et al 2004⁽³¹⁾ also concluded these findings in their study that intrathecal clonidine added to bupivacaine for spinal anaesthesia shortened the sensory block onset time. Kanazi et al [4] also studied intrathecal clonidine added to bupivacaine for spinal anaesthesia, shortened the sensory block onset time. These findings too go in favour of our results.

Al -Ghanem et al [5] however observed no difference time of onset in patients receiving dexmedetomidine (7.5 ± 3.4 min) and fentanyl (7.4±3.3min) as adjuvants to hyperbaric bupivacaine. The onset of time observed in the study by Al -Ghanem et al could be different from those of our study due to their use of isobaric bupivacaine and also could be due to patients positioning (lithotomy v/s supine in our study).

The duration of sensory block (Table 4), defined as two sensory segment regression, was significantly prolonged in BD group as compared to BS & BC groups respectively. This finding was similar to the study by Gupta et al [7] and Kanazi et al [4].

Time of onset of Motor block (Table 3)

In our study the time of onset of motor blockade was comparable among all 3 groups. Same results were obtained by Kanazi et al [4], Ghanem et al [5] and Gupta et al [7].

Duration of motor blockade (Table 5) was significantly prolonged in BD group. Significant motor blockade was

also seen in BC group as compared to BS group where bupivacaine was used alone. The group BS had significant shorter duration of motor block as compared to BC & BD groups but BC & BD groups when compared were comparable. Our results showed marked prolongation of motor block as compared to studies conducted by other authors which could be attributed to larger intrathecal volume of drug used in our study.

Requirement of Rescue Analgesia (Table 6)

It was seen that patients who received only bupivacaine i.e. BS group had the earliest request. This period was significantly prolonged in BD group, whereas BC & BD groups showed comparable results.

Gupta et al [7] showed results comparable to our study. Our results were also in concordance with Marziehlak et al 2015 [30] and Anil thakur et al 2015 [15] who found statistically significant increase in duration of analgesia with addition of clonidine to intrathecal bupivacaine.

H Saxena et al [17] (2009) and Singh R et al [29] (2012) also found similar results with increasing doses of clonidine.

Greater VAS scores in BC group when compared with BD group suggested that dexmedetomidine has better analgesic efficacy. The results were comparable with that of Gupta et al [7] who found significantly less requirement of rescue analgesia in 24hrs in dexmedetomidine group as compared to fentanyl group.

Kanazi et al [4] observed comparable analgesic effects of 3mcg dexmedetomidine to 30mcg clonidine but we noted significantly less requirement of rescue analgesia with 5mcg dexmedetomidine to 30mcg clonidine which could be due to dose dependent analgesic efficacy of dexmedetomidine.

Haemodynamic profile

Heart Rate(HR), Systolic Blood Pressure/Mean Arterial Pressure, Respiratory Rate (RR), SpO₂ were comparable in all 3 groups. No incidence of bradycardia or significant hypotension in any of the patients. All patients maintained their SpO₂ between 96-99% at all points of time. No respiratory depression occurred in any patient. These findings were in favour of various studies conducted [4,29] using low doses of dexmedetomidine.

Peri-operative side effects

Sedation was greater with dexmedetomidine as compared to clonidine but statistically insignificant. Sedation produced by dexmedetomidine differs from other sedatives as patient may be easily aroused and remain co-operative. These findings were in concordance with

those observed in study by Velayudha Srida Reddy [27], Nawaz Ahmed Shaik and VenkatsivaJangam J Anaesthesiol Pharmacol 2013; 29/3: 342-47 and Ustun Y et al [28], Gunduz M, Erdogan O, Benlidayi ME. Dexmedetomidine v/s Midazolam in out-patient 3rd molar surgery. J Oro Maxillofacial Surgery 2006; 64: 1353-8 (PubMed)

Mean HR of both BC & BD groups was more than 70/min indicating haemodynamic stability in BC & BD groups at given doses. No significant difference was observed with regard to post-operative sedation, vomiting and pruritis, all patients had sedation score of 1. These findings were comparable to studies conducted by Kanazi [4], Subhi M and Ghanem Al [5], Mustafa et al [6].

Conclusion

To conclude, our study report shows that the use of intrathecal dexmedetomidine as an adjuvant to hyperbaric bupivacaine seems to be an attractive alternative to clonidine and even fentanyl for longer duration surgeries due to its profound anaesthetic and analgesic properties combined with minimal side effects. Higher cost of dexmedetomidine could be the reason for preference for clonidine.

Effect of adding dexmedetomidine to other local anaesthetics like Ropivacaine or Levobupivacaine in other neuraxial blocks needs further research.

As dexmedetomidine produces long motor blockade, its use for day care surgeries should be restricted & it is undesirable for short term surgical procedures or ambulatory surgeries.

To conclude, Intrathecal dexmedetomidine is associated with prolonged motor block and sensory block haemodynamic stability and reduced demand of rescue analgesic in 24 hours as compared to clonidine and lone bupivacaine groups.

Conflict of interest:	All authors declare no COI
Ethics:	There is no ethical violation as it is based on voluntary anonymous interviews
Funding:	No external funding
Guarantor:	Dr. Hardeep Bariar will act as guarantor of this article on behalf of all co-authors.

References

1. N Culebras X, Mazzac C, Schiffer E, Tramer MR. Clonidine as an adjuvant to intrathecal local anaesthetic for surgery. Systemic review of randomized trials. RegAnaesth Pain Med 2008; 33: 159-67.
2. Grewal A. Dexmedetomidine: Newer Avenues. J Anaesthesiol Clin

- Pharmacol 2011; 27: 297-302.
3. Mantz J, Jossrand J, Hamada S. Dexmedetomidine: New insights. *Eur J Anaesthesiol* 2011; 8: 3-6.
 4. Kanazi GE, Aouad MT, Jabbour-Khoury SI, Al Jazzar MD, Allaeddin NM, Al-Yaman et al. Effects of low dose dexmedetomidine & clonidine on characteristics of bupivacaine spinal block. *Acta Anaesthesiol Scand* 2006; 50: 222-7.
 5. Al Ghanem SM, Massad IM, Al Mustafa MM, Al-Zaben KR, Qudaisat IY, Qataweh AM, et al. Effect of adding dexmedetomidine versus fentanyl to intrathecal bupivacaine on spinal block characteristics in gynaecological procedures. A double blind controlled study. *Am J Appl Sci* 2009; 6: 882-7.
 6. Al Mustafa MM, Abu Halaweh SA, Aloweidi AS, Murshidi MM, Ammari BA, Awwad ZM et al. Effect of dexmedetomidine added to spinal bupivacaine for urological procedures. *Saudi Med. J* 2009; 30: 365-70.
 7. Gupta R, Verma R, Bogrr J, Kohli M, Raman R, Kushwaha JK. Comparative study of intrathecal dexmedetomidine & fentanyl as adjuvants to bupivacaine. *J Anaesthesiol Clin Pharmacol* 2011; 27: 339-43.
 8. Katz J, Melzack R. Measurement of pain. *Surg Clin North Am* 1999; 79: 231-52.
 9. Bromage PR. Epidural analgesia. Philadelphia: WB Saunders 1978; 144: available at http://www.soap.org/media/newsletter/spring2003/research_column.htm.
 10. De Kock M, Wiederkehr P, Laghmiche A, Schottes JL. Epidural clonidine used as a sole analgesic agent during & after abdominal surgery. A dose response study. *Anaesthesiology* 1997; 86: 285-92.
 11. Lawhead RG, Blaxhall HS, Bylund BD. Alpha-2a is the predominant 2 adrenergic receptor subtype in human spinal cord. *Anaesthesiology* 1992; 72: 983-91.
 12. Gerteler R, Brown HC, Mitchell DH, Silvius EN. Dexmedetomidine: A novel sedative-analgesic agent. *Proc (Bayl Univ Med Cent)* 2001; 14: 13-21.
 13. Murthy TV, Singh R. Alpha2 adrenoceptor agonist dexmedetomidine role in anaesthesia and intensive care. A clinical review. *J anaesth clin pharmacol* 2009; 25: 267-72.
 14. Bajwa SJ, Bajwa SK, Kaur J, Singh G, Arora V, Gupta S et al. dexmedetomidine and clonidine in epidural anaesthesia. A comparative evaluation. *Indian J Anaesth.* 2011; 55: 116-21.
 15. Anil Thakur, Mamta Bhardwaj, Kiranpreet Kaur, Jagdish Dureja, Sarla Hooda, Sushila Taxak. Intrathecal clonidine as an adjuvant to hyperbaric bupivacaine in patients undergoing inguinal hernioraphy. A randomized double blind study. *J Anaesthesiol Clin Pharmacol* 2013 Jan-Mar 29(1):66-70
 16. Elhakim M, AbdelHamid D, Abdelfattach H, Magdey H, Elsayed A, Elshafei M. Effect of epidural dexmedetomidine on intra-operative awareness and post-operative pain after one lung ventilation. *Acta Anaesthesiol Scand* 2010; 54: 703-9.
 17. H saxena, S Singh, S Ghildiyal. Low dose clonidine with bupivacaine improves onset and duration of block with haemodynamic stability. *The internet journal of Anaesthesiology* 2009 volume 23.
 18. El-Henawy AM, Abd-elwahab AM, Abd-elmaksoud AM, En-qzairy HS and Boulis SR. addition of clonidine or dexmedetomidine to bupivacaine prolongs caudal analgesia in children. *Bs J Anaesth* 2009; 103: 268-74.
 19. Racle JP, Benkhadra A, Poy JY, Gleizal B. Prolongation of isobaric bupivacaine spinal anaesthesia with epinephrine and clonidine for hip surgery in elderly. *Anaesthanelg* 1987; 66: 442-6 (pubmed).
 20. Niemi L. effects of intrathecal clonidine in duration of bupivacaine spinal anaesthesia, hemodynamics, post-operative analgesia in patients undergoing knee arthroscopy. *Acta Anaesthesiol Scand* 1994; 38: 724-8 (pubmed).
 21. D Kock M, Gautier P, Fanard L, Hody JL, Lavand'homme P. Intrathecal ropivacaine and clonidine for ambulatory arthroscopy: A dose response study. *Anaesthesiology*. 2001; 94: 574-8.
 22. Mervivirta R, Kuusniemi K, Jaakkola P, Pihlajamaki K, Pitkanen M. Unilateral spinal anaesthesia for outpatient surgery: A comparison between hyperbaric bupivacaine and bupivacaine clonidine combination. *Acta Anaesthesiol Scand.* 2009; 53: 788-93.
 23. Brahim FA. A comparative study of adding intra thecal dexmedetomidine versus sufentanil to heavy bupivacaine for post-operative analgesia in patients undergoing inguinal hernia repair. *Benha M. J.* 2009; 26: 207-17.
 24. Hala EA, Shafie MA, Youssef H. Dose related prolongation of hyperbaric bupivacaine spinal anaesthesia by dexmedetomidine. A in *Shams J Anaesthesiol* 2011; 4: 83-95.
 25. Eisenach JC, De Kock M, Klimscha W. alpha 2 adrenergic agonists for regional anaesthesia. A clinical review of clonidine (1984-1995). *Anaesthesiology.* 1996; 85: 655-74.
 26. Mahendru V, Tewari A, Katyal S, Grewal A, Singh MR, Katyal R. randomized and controlled study to evaluate comparative efficacy of intrathecal clonidine, fentanyl and dexmed. as adjuvants to hyperbaric bupivacaine in spinal anaesthesia for lower limb surgeries. *J Anaesthesiol Clin Pharmacol* 2013; 29: 496-502.
 27. VelayudhaSidda Reddy, Nawaz Ahmed Shaik and VenkatsivaJangam, *J Anaesthesiol Clin Pharmacol* 2013; 29/3:342-347
 28. Ustun Y, Gunduz M, Erdogan O, Benlidayi ME. Dexmedetomidine versus midazolam in outpatient third molar surgery. *J Oromaxillofac surg.* 2006; 64: 1353-8 (pubmed).
 29. Singh R, Shukla A. randomized controlled study to compare the effects of intrathecal dexmedetomidine and clonidine on sensory analgesia and motor block of hyperbaric bupivacaine. *Indian journal of fundamental and applied life sciences (internet)* 2012 oct 28:24-33. Available at <http://www.cibtech.org/jls.htm>
 30. Marziehlahk et al, *Trauma Mon* 2015 May; 20(2):e 17879, doi :10.5812/Trauma Mon 7879 Epub 2015 May 20.
 31. Strebel S, GurlzarJa, Schneider MC, Aeschbach A, Kindler CH. Small dose intrathecal clonidine and isobaric bupivacaine for orthopaedic surgery. A dose response study. *Anaesth Analg* 2004; 99:1231-8 (Pubmed).



Abdominal Vascular Compression Syndromes and Imaging Features.

B. Srinivasa Reddy, Hameed Arafath, B. Mallikarjunappa

Department of Radiodiagnosis, PESIMSR, Kuppam, Andhra Pradesh, India

Abstract

Some intra abdominal structures like celiac artery, SMA and aberrant vessels may compress the adjacent hollow viscera, may be symptomatic or incidental imaging findings. These syndromes, though the etiopathogenesis is doubtful, will have some classical clinical findings. They are median arcuate ligament syndrome, May-Thurner syndrome, nutcracker syndrome, superior mesenteric artery syndrome, ureteropelvic junction obstruction, ovarian vein syndrome, and other forms of ureteral compression. Multidetector computed tomography (MDCT) is the imaging modality of choice, however interpretation of imaging findings should be carefully correlated with clinical findings.

Keywords: MALS- Median arcuate ligament syndrome, SMAS- Superior mesenteric artery syndrome, SMA – superior mesenteric artery, AMA - Aortomesenteric angle, AMD - Aortomesenteric distance

Introduction

Compression of the proximal celiac artery, transverse duodenum, left common iliac vein (CIV), left renal vein (LRV), ureteropelvic junction (UPJ) and ureter can occur due to their close anatomic relationship to adjacent ligaments as well as bony and vascular structures.

Anatomic or morphologic findings that predispose to such compression may occasionally be encountered in asymptomatic patients who undergo imaging for unrelated causes. Thus, caution should be exercised to avoid overdiagnosis of these syndromes. It is important that the diagnosis of these syndromes not be based on imaging findings alone.

Multidetector computed tomography (MDCT) is the imaging modality of choice for many of these syndromes due to high contrast, high spatial and temporal resolution, capacity for obtaining isotropic data sets that allow multiplanar, two-dimensional and three-dimensional (3D) postprocessing, remarkable accuracy, widespread accessibility, speed, and relative noninvasiveness.

Ultrasonography (US) is largely operator, patient, and region dependent, although duplex US can provide information on the hemodynamic significance of vascular compressions.

Address for correspondence

Dr. B. Mallikarjunappa, Professor, Department of Radio-diagnosis, PESIMSR, Kuppam- 517425, Andhra Pradesh, India
Email: drmallikarjunappa@gmail.com

Received: 14.09.18

Accepted: 12.03.19

We report six cases, i.e. two cases of median arcuate ligament syndrome (MALS), a case of superior mesenteric artery syndrome (SMAS), two cases of superior mesenteric vein (SMV) tributary compressing duodenum between SMA and aorta and a case of retrocaval ureter with classical imaging and clinical history.

Our aim is to familiarize radiologists with the MDCT appearance of these syndromes and the added benefit of MPR in diagnosis.

Median Arcuate Ligament Syndrome

It is also known as celiac artery compression syndrome or Dunbar syndrome, a rare entity characterized by narrowing of the proximal celiac trunk by the median arcuate ligament, which courses superiorly over the origin of celiac artery.

Harjola first described this syndrome in 1963 [1] and then Dunbar [2] in 1965.

It typically affects young patients of 10-40 years age and females are affected more. Post-prandial epigastric abdominal pain, vomiting and weight loss are the classic clinical symptoms. Compression of celiac artery by the ligament does not produce symptoms, probably due to collateral supply from the superior mesenteric artery in 10 to 14 % of the pts.

Doppler ultrasound [4] at compressed or narrowed segment of celiac artery reveals variation of peak systolic velocity (PSV) during respiration with a marked increase during expiration with PSV greater than 200 cm/s. A greater than 3:1 ratio of PSV in the celiac artery in

expiration compared with the PSV in the abdominal aorta just below the diaphragm is another useful criterion to diagnose MALS.

MDCT showing median arcuate ligament thickness of more than 4 mm³ is considered abnormal. Focal narrowing with hooked appearance is the hallmark which can help distinguish this condition from other etiologies of celiac artery stenosis such as atherosclerosis. Other findings include poststenotic dilatation and collateral vessels such as pancreaticoduodenal arcade from superior mesenteric artery.

We report two cases of of MALS in 26 year and 35 year old male patients showing moderate to severe narrowing of celiac artery by median arcuate ligament with post stenotic dilatation (fig. 1 and 2).

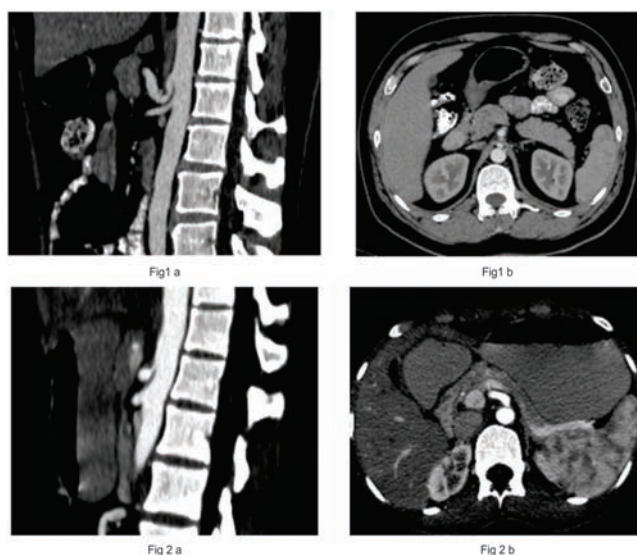


Fig 1 and 2- [a] : Oblique sagittal and [b] axial contrast MDCT images showing celiac artery compression by the median arcuate ligament with post stenotic dilatation.

Superior Mesenteric Artery Syndrome

It is an uncommon entity of duodenal obstruction (third part), extrinsically compressed between SMA and abdominal aorta due to reduced aortomesenteric angle (AMA). It is similar to MALS in affecting young patients and females.

Incidence of this condition is 0.013-0.3%. Von Rokitanski first described the condition in 1861. Later, Wilkie described in detail.

Risk factors include rapid weight loss which decreases fatty pouch between SMA and aorta, corrective scoliosis surgery which causes lengthening of the spine and hip or body cast that applies external abdominal pressure, abnormal high fixed position of ligament of treitz and low origin of SMA. There is controversy in etiopathogenesis and the relationship between anatomical findings and clinical symptoms is not well established.

Aortomesenteric angle (AMA) and the aortomesenteric distance (AMD) are reduced in the patients with risk factors [5,6].

The normal AMD is typically 10 to 28 mm and is measured at the level of the horizontal part of the duodenum as it travels between the abdominal aorta and SMA [6,7]. Aortomesenteric angle normal value is 25 to 60 degree. AMA of 6 to 15 degree and AMD of 2 to 8 mm is diagnostic of superior mesenteric artery syndrome (SMAS).

Patients will present with postprandial abdomen pain, vomiting, weight loss which relieves while lying on left lateral and prone position.

Barium study shows dilated stomach, dilated second part of duodenum and vertical cut off at third part of the duodenum with no mucosal irregularities and the obstruction relieves while lying in prone position. MDCT will confirm the above findings.

Mega duodenum is the differential diagnosis which will have similar radiological findings.

We report a case (fig.3) of 47 year female presenting with pain abdomen and vomiting. MDCT showed reduced AMA and AMD causing compression on third part of duodenum.

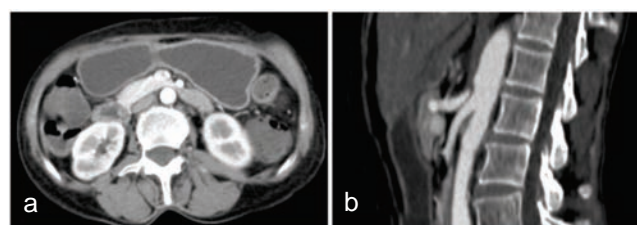


Fig. 3: MDCT images axial section (a) showing reduced distance between SMA and descending aorta causing compression over the third part of duodenum and sagittal section (b) showing acute angle of SMA with aorta and reduced aortomesenteric distance.

We report a case of 60 year old female presenting with pain abdomen, vomiting and weight loss. Barium study showed dilated stomach, first, second part of duodenum with vertical cut off of third part of the duodenum with normal mucosa and the obstruction was relieved while lying in prone position. MDCT (fig. 4) showed reduced AMA with third part of duodenum compressed by tributary of SMV between SMA and aorta.

We report a case of 46 year male where (fig. 5) MDCT showing reduced space between aorta and SMA with two SMV tributaries coursing posterior to SMA at L3 level between superior mesenteric vessels and aorta, causing compression on third part of duodenum with proximal dilatation of the duodenum and stomach.

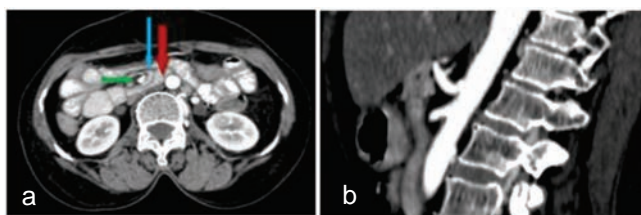


Fig. 4: MDCT images- axial section (a) showing compression of third part of duodenum (red arrow) between SMA (green arrow) and aorta by tributary of SMV (blue arrow) and sagittal section (b) showing reduced AMA.

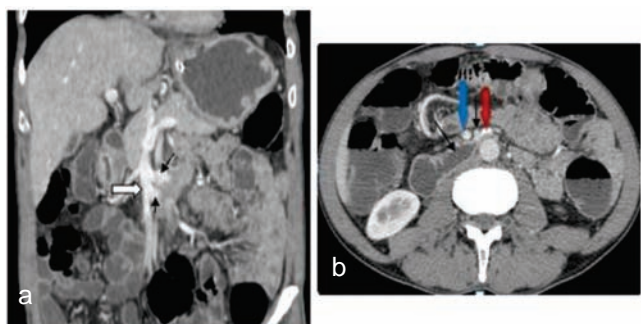


Fig. 5 : MDCT images oblique coronal section (a) showing two tributaries (black arrow), one below the other draining into SMV (white arrow) and axial section (b) showing abrupt tapering of third part of duodenum (oblique black arrow) by inferior tributary (red arrow) of SMV (blue arrow) shown in oblique coronal between SMA (vertical black arrow) and aorta.

Retrocaval Ureter

A preureteral vena cava and circumcaval ureter or preureteral vena cava, a rare congenital anomaly where ureter classically courses medially at L3 behind the inferior vena cava (IVC) winding around it and then passes laterally in front of it to then course distally to the bladder. Hydronephrosis is due to kinking of the ureter, a ureteric segment that is adynamic or compression against the psoas muscle.

Retrocaval ureter was first reported by Hochstetter [6]. Abeshouse and Tawkin (1952), Muller and Engel (1952), Goodwin et.al (1957)[7] and Rowland et.al (1960) have described the radiological features of circumcaval ureter. The IVC normally develops from the posterior cardinal, subcardinal and supracardinal veins, which undergo sequential development, anastomosis and regression to become the inferior vena cava and azygos venous system. Normally, the right subcardinal vein forms the pre-renal IVC, the subcardinal-supracardinal anastomosis forms the renal segment and the right supracardinal vein forms the post-renal IVC. In a circumcaval ureter, there is anomalous development of the infrarenal IVC from the right posterior cardinal vein that is embryologically more medial.

Retrocaval ureter may be asymptomatic or may present

with flank pain, UTI, calculus or hematuria usually at 3rd - 4th decade in male patients.

Prevalence rate of about 0.9 in 1000 with a male to female ratio of 2.8 [8].

Salonea [8,10] described two types of retrocaval ureter. Type I - the ureter crosses behind the inferior vena cava at the level of the third lumbar vertebra and it has an 'S' or fish hook type shape at the point of obstruction. Marked hydronephrosis is seen in 50% of patients. In the less common Type II, the crossover occurs higher at the level of the renal pelvis.

Dilated medial deviation of the ureter at L3 with hydronephrosis and 'S' or sickle shaped deformity at the level of displacement is the classical IVU findings but retroperitoneal fibrosis, a retroperitoneal mass, previous surgery must be kept in mind as differential diagnoses [9]. Retrograde pyelography was the old imaging modality.

Spiral CT delineation of the ureter and its course in relation to the IVC and location of IVC lateral to the right pedicle of the L3 vertebra were diagnostic of circumcaval ureter.

We report a case of retro caval ureter as shown in fig. 6.

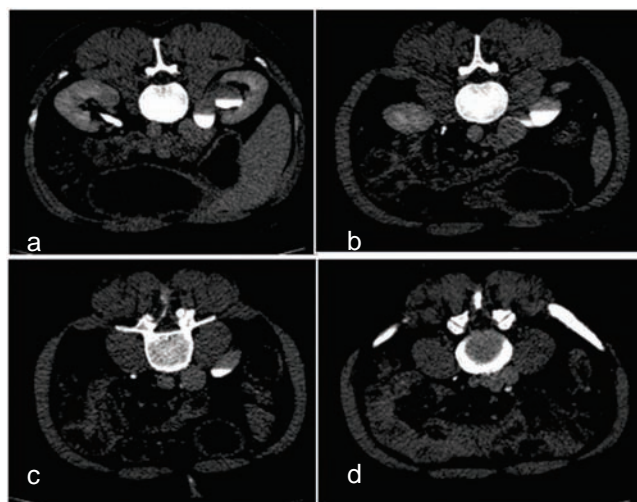


Fig.6 : Sequential MDCT axial sections in craniocaudal direction - (a) showing dilated renal pelvis and proximal ureter (b) showing compressed ureter coursing posterior to IVC (c) ureter seen on the left lateral aspect of IVC (d) ureter seen anterior to IVC

Other abdominal vascular compression syndromes

Anatomic compression of the left renal vein between SMA and aorta is described as anterior nutcracker syndrome or if the left renal vein has a retroaortic or circumaortic course, between the aorta and the underlying vertebral body resulting in its compression, it is described as posterior nutcracker syndrome.

May-Thurner Syndrome (also known as iliac vein

compression syndrome / Cockett syndrome), consists of obstruction of the left common iliac vein when it passes between the right common iliac artery and the spine.

Conclusion

The abdominal vascular compression syndromes discussed here are uncommon and are potentially easily missed on radiologic examinations, particularly in a nonspecific and vague clinical setting. Hence, knowledge of the typical imaging findings and associated clinical symptoms is essential so that they can be carefully sought and excluded. However, because these findings may also exist in healthy individuals as anatomic variants, it is important to correlate radiologic findings with clinical symptoms to identify the subset of patients who will benefit from treatment.

We are grateful and thankful to Dr. Roopa Suresh and Dr. Suresh Krishnamoorthy, AMD and MD of PESIMSR, Dr. Krishna Rao, principal and Dr. Venugopal, medical superintendent and Dr. Ramesh Kumar, Prof & HOD (Radiodiagnosis) for their continued support in academics.

Conflict of interest:	All authors declare no COI
Ethics:	There is no ethical violation as it is based on voluntary anonymous interviews
Funding:	No external funding
Guarantor:	Dr. B. Mallikarjunappa will act as guarantor of this article on behalf of all co-authors.

References

1. Harjola PT. A rare obstruction of the coeliac artery, report of a case. *Ann Chir Gynaecol Fenn* 1963; 52:547-550.
2. Dunbar JD, Molnar W, Beman FF, Marable SA. Compression of the celiac trunk and abdominal angina. *Am J Roentgenol Radium Ther Nucl Med* 1965; 95:731-744.
3. Eliahou R, Sosna J, Bloom AI. Between a rock and a hard place: Clinical and imaging features of vascular compression syndromes. *RadioGraphics* 2012;31:E33-49.
4. Erden A, Yurdakul M, Cumhuri T. Marked increase in flow velocities during deep expiration: A duplex Doppler sign of celiac artery compression syndrome. *Cardiovasc Intervent Radiol* 1999;22:331-2.
5. Sapkas G, O'Brien JP. Vascular compression of the duodenum (cast syndrome) associated with the treatment of spinal deformities. A report of six cases. *Arch Orthop Trauma Surg* 1981;98:7-11.
6. Hochstetter f.III.souger Morph j Ahrab 1893;20:542.
7. DD Singh, PSanjeev, RKSharma. Spiral Ct evaluation of circumcaval ureter (retrocaval ureter. *IJRI;Year : 2001;Volume : 11; Issue :2; 83-84.*
8. Salonia, A., Maccagnano, C., Lesma, A., Naspro, R., Suardi, N., Guazzoni, G., Montorsi, F., Rigatti, P. Diagnosis and treatment of the circumcaval ureter.
9. Leutin EM, Haramati N et al. CT Diagnosis of circumcaval ureter, *AJR* 1988; 150: 591-594.
10. M. M. Kenawi and D. I. Williams, "Circumcaval ureter: a report of four cases in children with a review of the literature and a new classification," *British Journal of Urology*, vol. 48, no. 3, pp. 183-192, 1976.



Effectiveness of Ultrasound Biomicroscopy (UBM) in ensuring success in secondary IOL implantation

Shashi Prabha Prasad¹, Rupali Maheshgauri², Shivani P. Pattnaik³, Priti Kumari³,
Richa B Naik³, Pari S Desai³, Brig. Amarjit Singh⁴

¹Professor, ²Associate Professor, ³Junior Residents, ⁴ Professor (Radiology),
Principal Director & CEO, Dr. D. Y. Patil Medical College, Pimpri, Pune, Maharashtra, India

Abstract

Ultrasound biomicroscopy (UBM) provides high-resolution non-invasive in vivo imaging of the anterior segment. This study was carried out with the purpose of evaluating the role of ultrasound biomicroscopy (UBM) in safe and effective secondary IOL implantation in aphakes. The study was carried out between the period of January 2011 to January 2013 at a tertiary eye care center and a total of 16 cases including post traumatic and surgically induced aphakia were included. Secondary IOL implantation in sulcus over the capsular remnants could be achieved in 14 out of 16 patients. (87.5%). UBM is an excellent modality for assessing anterior capsular integrity prior to secondary IOL implantation.

Keywords: UBM, Secondary IOL Implantation, Aphakia, Non - Invasive.

Introduction

UBM is a technique used to visualize the anterior chamber of the eye with high frequency ultrasound. The probe used for UBM has a frequency of 35-40 MHz with a resolution of 40 microns and penetration depth of 4mm. A shallow learning curve allows user to learn the scanning technique and protocol quickly and easily, typically with only a few scans learning curve. The cornea, anterior chamber, posterior chamber, the angle and ciliary body can be easily seen. The anterior lens surface also can be visualized. The angle of the anterior chamber can be assessed with the landmark being the scleral spur which is located where the trabecular meshwork meets the interface between sclera and ciliary body. The iris has a planar configuration with slight anterior bowing.

There are various uses of UBM highlighted in different ocular pathologies. Intraocular lens optics and haptics give foreign body type echoes. The capsular bag cannot be localized and so the position of the haptic is used to identify if the loop is in the sulcus, bag or is dislocated. A posterior chamber IOL appears on UBM as a highly reflective plate (corresponding to the lens optics) in the retro pupillary plane with reverberation artifacts behind it. The integrity or absence of the posterior capsule can

be studied prior to secondary lens implantation. This is useful especially in cases with non-dilating pupils with extensive posterior synechiae. Synechiae can also be picked up on the UBM.

UBM is a useful tool in narrow angle glaucoma where the cause could be abnormal size or position of one of the structures in the angle. When view of the anterior segment structures is blocked by hyphaema, UBM can be used to assess the structural damage. Beyond that, UBM allows users to detect ciliary body cysts before lens implantation, fibrin and retained lens fragments, and anterior supra-choroidal effusions [1].

Case Report

The study was performed at tertiary care center. Sixteen eyes of previously aphakic patients were studied.

Inclusion criteria

- 1.) A minimum of two months between cataract extraction surgery which resulted in aphakia;
- 2.) No posterior segment or major structural anterior segment pathology secondary to trauma;
- 3.) Best corrected visual acuity to be better than or equal to 20/80;
- 4.) Those who had at least 3 clock hours of capsular integrity and similar one 180° opposite as confirmed by UBM. The ophthalmologic examination, which included refraction and measurement of best corrected visual acuity, slit lamp biomicroscopy, funduscopy and appplanation

Address for correspondence

Dr. Shashi Prabha Prasad, Professor, Dr. D. Y. Patil Medical College,
Pimpri, Pune-18, Maharashtra, India
Email: shshind2006@gmail.com

Received: 26.12.16

Accepted: 26.03.17

tonometry.

Exclusion criteria

- 1.) Small pupils;
- 2.) Patients with corneal decompensation, inactive chronic uveitis or active uveitis, pseudo-exfoliation and anatomical congenital alterations;
- 3.) Retina and optical nerve diseases which might increase surgical risk or be potentiated by the new surgery;
- 4.) Uncontrolled glaucoma cases or glaucoma under clinical control but with a cup larger than 0.5;
- 5.) Corneal opacities;
- 6.) High myopia;
- 7.) Dislocated IOLs. 10 to 14 % of the pts.

Doppler ultrasound [4] at compressed or narrowed segment of celiac artery reveals variation of peak systolic velocity (PSV) during respiration with a marked increase during expiration with PSV greater than 200 cm/s. A greater than 3:1 ratio of PSV in the celiac artery in expiration 3.

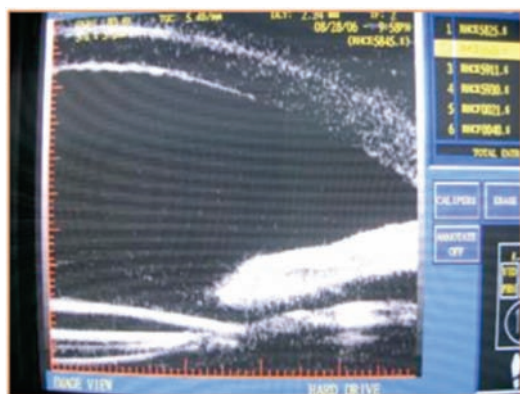


Fig. 1 : A preoperative UBM

A preoperative UBM (Fig. 1) was done in all 16 patients to assess the capsular integrity. All surgeries were performed by a single surgeon. A large 7mm limbal incision was taken 90° away from the intact capsular remnants. A good anterior vitrectomy was done. A single piece all PMMA IOL with 6.5mm optic and 13mm overall length was used. Hydroxypropylmethyl cellulose was injected behind the iris to increase the space in the sulcus for assisting in easy IOL implantation. The haptics were placed over the capsular remnants which had been identified preoperatively by UBM. AC was washed off the viscoelastic and formed with air. The limbal wound sutured with 5 sutures of 10'0 polyamide.

Postoperatively the patients were examined on day 1,2,7,14 and 30 and detailed slit lamp evaluation was done.

On the return visit after 1 month, ultrasound biomicroscopy was performed using a Humphrey model 840 Ultrasound Biomicroscope with a 50 MHz transducer to see the location of IOL and the haptics. It was confirmed by UBM that all cases had the haptics resting on capsular remnants.

On UBM examination, the following were evaluated:

- 1.) Positioning of the intraocular lens haptics at the 3 and 9 hour regions;
- 2.) Measurement of the distance between the posterior surface of the iris and the anterior surface of the intraocular lens, at the 4 quadrants. This measurement was performed at 4 mm from the scleral spur, tracing a straight line perpendicularly to the surface of the intraocular lens at the 3, 6, 9 and 12 hour meridians (Fig. 1).

Results

This study involved 16 patients. 8 males (50%) and 8 females (50%) who underwent secondary intraocular lens implantation in sulcus over the capsular remnants. Patients who were aphakic owing to prior cataract surgery or trauma rendering them aphakic were selected for this study. 48% patients were post-surgical aphakes and 52 % were post traumatic aphakes.

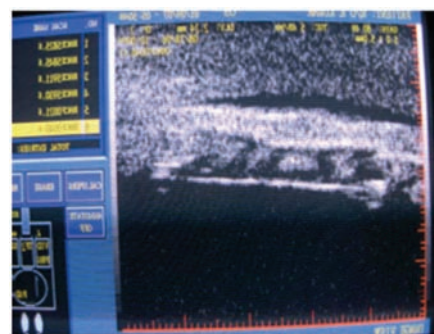


Fig. 2: Post-operative UBM showing PCIOL in sulcus.

Secondary IOL implantation in sulcus over the capsular remnants could be achieved in 14 out of 16 patients (87.5%).

Out of the sixteen patients that were operated, 2 patients did not have a successful secondary IOL implantation procedure. One suffered intra-operative damage to the remnants of the posterior capsule so the IOL could not be placed on it. And the other patient suffered post-operative subluxation of IOL. (Table)

Table. Complications encountered postoperatively

Subluxated IOL	1
Dislocated IOL	0
IOL drop in vitreous	0
Tearing of posterior capsule	1

Discussion

Loss of a good capsular support is one of the intraoperative complications that may interfere with the decision of primary intraocular lens implantation at the time of surgery, whereas the decision of secondary implantation might be considered later aiming for proper optical correction of the resultant aniseikonic condition following unilateral postoperative aphakia.

Several alternatives for the surgical correction of aphakia have been suggested (i.e., a posterior chamber intraocular lens (PCIOL) placed in the ciliary sulcus, or preferably in the capsular bag if possible); however in the absence of a good capsular support, an anterior chamber IOL, an iris-fixated IOL, glued IOL or a sutured PCIOL would be suggested [2].

The optical correction of aphakia has been considered as being a challenging situation, with the option of IOL implantation to be considered in the majority of cases.

In aphakic eyes with sufficient capsular support, implantation of a PCIOL has been reported to be more superior than the anterior chamber IOL, being away from the corneal endothelium and being more anatomically placed [3].

Two technical difficulties have to be overcome in implantation of posterior chamber intraocular lenses (PCIOLs), especially in eyes with previous anterior vitrectomy and decreased scleral rigidity: first, good structural integrity of sulcus and second, good posterior capsular support. Incongruence of the two may lead to long-term complications [4,5].

Ultrasound biomicroscopy (UBM) is a high resolution ultrasound technique that allows imaging of structural details of anterior segment at near microscopic resolution in living patients.

The ultrasound biomicroscope works on the principle of an ultrasound but at a higher frequency. The normal B scan probe works at a resolution of 10 to 12 MHz while the UBM probe works at a frequency of 35 - 50 MHz or higher. The basic parts of a UBM are the same as that of a standard ultrasound and consist of a hand piece with transducer, a computer console which has the required hardware and software specific for the purpose, a monitor, a printer and a foot switch. The UBM software has special measuring features for measuring thickness of tissues or measuring angles. Unlike a B scan probe where the transducer is sealed inside along with its coupling media the UBM probe requires a medium. The machines have a silicon cup with water or methylcellulose as used these days as the coupling media. The probe sweep can be set for a sweep of 200 or 300. The

transducers in the newer machines are threaded on and can easily be interchanged for one of a different frequency.

It provides detailed two dimensional gray scale images of epibulbar conjunctiva, cornea and anterior sclera, aqueous chambers, anterior chamber angle structures, ciliary body, crystalline lens, zonules and anterior vitreous.

The transducer frequency of UBM is 50MHz in contrast to 7.5-10 MHz of conventional ultrasound.

It produces cross sectional images of anterior segment structures providing a lateral resolution of 59 μ and axial resolution of 25 μ with a depth of penetration of approximately 4-5mm (upto pars plana region of the eye).

Ultrasound biomicroscopy, a technique that allows for a real time panoramic view to image the anterior segment, revealing the ciliary body and peripheral retina, was found as an adjuvant tool to evaluate, Manabe et al. used ultrasound biomicroscopy to study eyes with secondary IOL implantation and found that only 37% of the haptics were located adequately in the ciliary sulcus and also demonstrated that 48% of the haptics in their series were caught in the vitreous, even though anterior vitrectomy had been performed, that might induce vitreous traction and cause complications such as retinal detachment or macular hole and edema [8].

In the current study, UBM visualization at the haptics sites revealed no vitreous bands entrapped between the haptics and ciliary body at the insertion site.

In 1992, Pavlin et al. described biometric criteria that could be used for reproducible measurement of various anterior segment structures [9,10].

He has described the usefulness of ultrabiomicroscopy in evaluation of the state of posterior capsule and anatomy of ciliary sulcus for the prognosis of secondary IOL implantation [11,12].

Pavlin et al. also described the usefulness of ultrabiomicroscopy in eyes in various diseases, including glaucoma, ciliary body tumors, plateau iris syndrome, pigment dispersion syndrome to evaluate the condition of the angle and the progress of glaucoma [13,14].

It has a wide range of clinical applications ranging from cornea, glaucoma, retina, trauma and a host of others. It displays the anterior segment anatomy of angle, iris, ciliary body, lens and anterior vitreous clearly in cloudy/ opaque corneas.

Postoperatively, UBM can show the site and location of IOL and the positioning of the haptics. A posterior chamber IOL appears on UBM as a highly reflective plate

(corresponding to the lens optics) in the retro pupillary plane with reverberation artifacts behind it.

In most eyes with posterior chamber IOL an UBM imaging can show whether the IOL haptics are in the capsular bag, in the ciliary sulcus or in some other anatomic location.

Conclusion

UBM is a useful device to evaluate aphakic eyes before secondary IOL implantation through good evaluation of the anterior segment with special attention to the anterior capsular integrity, ciliary sulcus, anterior chamber depth, corneal thickness, and detection of any structural changes in the anterior segment resulting from the remote cause of aphakia.

UBM is an excellent modality to determine anterior capsular integrity prior to secondary intraocular lens implantation. Preoperatively UBM can exactly delineate the available capsular support for placing the haptics especially in non-dilating pupils. Without UBM there will be a dilemma whether to attempt secondary IOL without quantification of the remnants of the anterior capsule based only on slit lamp examination. The sulcus IOL implantation is a far simple proposition as compared to more challenging surgeries as glued IOL, scleral fixated IOL or iris fixated IOL implantation.

Thus UBM is imperative in cases of aphakia where capsular remnants could not be identified.

Conflict of interest:	All authors declare no COI
Ethics:	There is no ethical violation as it is based on voluntary anonymous interviews
Funding:	No external funding
Guarantor:	Dr. Shashi Prabha Prasad will act as guarantor of this article on behalf of all co-authors.

References

1. J Ophthalmol. August 2016; 2016: 8501842.
2. Kamal A. M., Hanafy M., Ehsan A., Tomerak R. H. Ultrasound biomicroscopy comparison of ab interno and ab externo scleral fixation of posterior chamber intraocular lenses. *Journal of Cataract and Refractive Surgery*. 2009;35(5):881–884.
3. McAllister A. S., Hirst L. W. Visual outcomes and complications of scleral-fixated posterior chamber intraocular lenses. *Journal of Cataract & Refractive Surgery*. 2011;37(7):1263–1269.
4. Sewelam A., Ismail A. M., El Serogy H. Ultrasound biomicroscopy of haptic position after transscleral fixation of posterior chamber intraocular lenses. *Journal of Cataract and Refractive Surgery*. 2001;27(9):1418–1422.
5. Bhutto I. A., Kazi G. Q., Mahar P. S., Qidwai U. A. Visual outcome and complications in Ab-externo scleral fixation IOL in aphakia in pediatric age group. *Pakistan Journal of Medical Sciences*. 2013;29(4):947–950.
6. Alp M. N., Buyuktortop N., Hosal B. M., Zilelioglu G., Kural G. Ultrasound biomicroscopic evaluation of the efficacy of a transillumination technique for ciliary sulcus localization in transscleral fixation of posterior chamber intraocular lenses. *Journal of Cataract & Refractive Surgery*. 2009;35(2):291–296.
7. Hudde T., Althaus C., Sundmacher R. Postoperative ultrasound biomicroscopic evaluation of the haptic position in transsclerally sutured posterior-chamber lenses as compared with the intraoperative endoscopic position. *German Journal of Ophthalmology*. 1996;5(6):449–453.
8. Manabe S.-I., Oh H., Amino K., Hata N., Yamakawa R. Ultrasound biomicroscopic analysis of posterior chamber intraocular lenses with transscleral sulcus suture. *Ophthalmology*. 2000;107(12):2172–2178.
9. Pavlin CJ, Rootman D, Arshinoff S, Harasiewicz K, Foster FS. Determination of the haptic position of transsclerally fixated posterior chamber intraocular lenses by ultrasound biomicroscopy. *J Cataract Refract Surg* 1993;19:573-7
10. Pavlin CJ, Sherar MD, Foster FS. Subsurface ultrasound microscopic imaging of the intact eye. *Ophthalmology*. 1990;97:244–50.
11. Pavlin CJ, Harasiewicz K, Sherar MD, Foster FS. Clinical use of ultrasound biomicroscopy. *Ophthalmology*. 1991;98:287–95
12. Pavlin CJ, Harasiewicz K, Foster FS. Ultrasound biomicroscopy of anterior segment structures in normal and glaucomatous eyes. *Am J Ophthalmol*. 1992;113:381–9.
13. Pavlin CJ, Foster FS. Ultrasound biomicroscopy in glaucoma. *Acta Ophthalmologica – Suppl*. 1992;204:7–9.
14. 10. Pavlin CJ, Ritch R, Foster FS. Ultrasound biomicroscopy in plateau iris syndrome. *Am J Ophthalmol*. 1992;113:390–95.



Determinants for Predicting Number of Discharges in a Tertiary Care Hospital

Kasturi Shukla, Nirmal Shah, Hem Chandra¹

Department of Symbiosis Institute of Health Sciences, Symbiosis International University,
Pune, Maharashtra, India.

¹Vice-Chancellor, HN Bahuguna Uttarakhand Medical Education University, Govt. Doon Medical College
Campus, Dehradun, Patel Nagar, Dehradun - 248001, Uttarakhand, India

Abstract

Minimum variance in hospital census can lead to better utilization of bed capacity without creating an overflow situation. Identifying determinants of discharge predictions combined with the scheduling of patients for admission according to the prediction is one of the ways to ensure minimum census variance. Objective - This quantitative study attempts to investigate the presence of 'Weekend Effect' and other determinants for predicting number of discharges in next 24 hours. Admission control system data of patients admitted in a 200 bed hospital in Pune was analysed from 1 Jan 2015 to 23 July 2015 (204 days). Length of Stay (LOS), census, and weekends were included for analysis. Saturday, Sunday, Monday were clubbed together as weekend and remaining days considered as weekdays. Dichotomous frequency values were created using the values above and below the third quartile for each variable and used to compute the odds ratio. Admission date-time and discharge date-time of 9039 patients was collected of which 3792 patients with LOS less than 24 hrs were removed. Remaining 5247 patients were further analysed. Mean number of admissions and discharges was 25,130 was mean census and mean TLOS was 742 days. out of the 200 available beds around 130 were regularly occupied which shows that around 65% of the total bed capacity was being utilized. The probability of ≤ 30 patients getting discharged was 4.89 times more likely when census was ≤ 137 , 2.47 times more likely if day of discharge was a weekend and 2.23 times more likely if TLOS was ≤ 886 days. We conclude that number of discharges is determined by daily census, TLOS and day of the week. Further, strong 'Weekend Effect' was observed to be a determining factor for discharge prediction.

Introduction

A steady patient census in hospitals, in other words minimum variance in census, leads to increase in average bed occupancy levels without increasing the probability of an overflow situation [1]. Moreover, since hospitals, in general, staff for maximum census levels, reducing census variance increases the economies of scale through better utility of manpower.

Sensibly, census variance can be minimized by admitting exactly the same number of patients as are discharged on each day. In practice, this simple idea is very difficult to accomplish since the number of discharges and a portion of the number of admissions (emergency admissions) are stochastic (random) variables [2].

Admissions control systems use two different methods

to help reduce census variance [3]. The first method is to wait each day until the number of discharges is known and then to call in an appropriate number of patients from a waiting list. The second method involves identifying variables that prediction of future discharges, combined with the scheduling of patients for admission according to the prediction. Although the distribution of discharges is different in each hospital, certain characteristics of discharge distributions are common to almost all hospitals, especially the "Weekend Effect" [4,5]. However, such studies are rare in an Indian setting where non-clinical variables are analysed to identify determinants for predicting discharges. This quantitative study investigates the weekend effect and identifies such factors that have a determining effect on number of discharges that will take place in next 24 hours.

Methods

Study Design and Setting

This study was conducted using quantitative tools by capturing admission control system data of patients admitted in a 200-bedded super-speciality hospital in

Address for correspondence

Dr. Kasturi Shukla, Assistant Professor, Department of Symbiosis
Institute of Health Sciences, Symbiosis International University, Pune,
Maharashtra, India.

Email: kasturiagnihotri@rediffmail.com.

Received: 18.01.17

Accepted: 26.09.17

Pune city between 1 Jan 2015 to 23 July 2015 (204 days).

Study Procedure

After taking permission from the hospital authorities, admission date-time and discharge date-time of all patients was collected, irrespective of the ward in which they were admitted. This data was collected from the proprietary HMIS software that the hospital used. Length of Stay (LOS) was computed using the admission date-time along with discharge date-time. Patients with LOS less than 24 hrs were removed from the further study since hospital admission control systems have a different process for day-care admissions. Study variables, that were analysed for remaining patients, included admissions in last 24 hours, Bed Occupancy, Total LOS of Admitted Patients, and number of actual discharges planned for next 24 hours. Following assumptions were made:

- (a) Deaths were considered as discharges,
- (b) Re-admissions were considered as fresh new admissions and not a continuation of previous admission. LOS of all admitted patients (noted as census for that day) was calculated and added up to find the TLOS.

For instance, TLOS of all admitted patients on 10 Jan 2015 at 7:00 pm was 743.21 days.

Data Analysis

The data collected between 01 Jan 2015 to 23 July 2015 (n = 204) was analysed using IBM-SPSS (ver. 23.0). The independent variables were evaluated as determinants for predicting numbers of discharges on subsequent day.

Further, dichotomous frequency values were created using the values above and below the third quartile for each and used to compute the odds ratio. For further

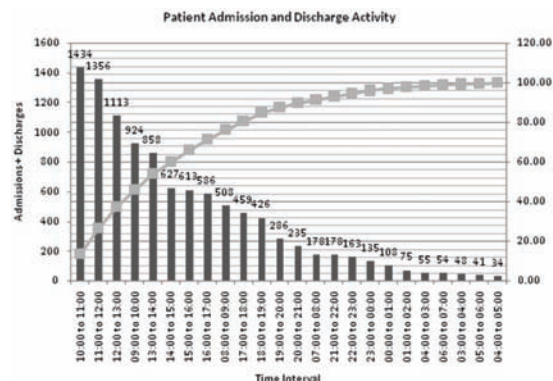


Figure 1: Hourly distribution of the admission and discharge time

analysis, Saturday, Sunday, Monday were clubbed together as weekend and remaining days considered as weekdays to analyse the 'Weekend Effect'. The frequencies obtained were used to calculate the odds ratio.

Result

Admission date-time and discharge date-time of 9039 patients was collected, irrespective of the ward in which they were admitted. 3792 patients with LOS less than 24 hrs were removed from the further study since hospital admission control systems have a different process for day-care admissions. The data of remaining 5247 patients was further analysed. A Pareto analysis of the admission time and discharge time of the remaining 5247 patients was done to decide the ideal time to make coming 24-hr predictions.

As can be seen from Fig. 1, nearly 85% of the hospital admissions and discharges activity in all IPD wards were accomplished between 8 a.m. to 7 p.m. Hence all hospital metrics described above were captured at 7p.m. every day. Descriptive Statistics for the study variables are presented in table 1.

Table 1: Descriptive statistics of study variables

Descriptive Statistics					
	Discharges	Admissions	Census	TLOS	
Total count for 204 days	5125	5099	-	-	
Mean of Daily Counts	25.12	25.00	130.65	742.65	
Median of Daily Counts	27.00	25.00	130.00	726.76	
Std. Deviation	8.39	7.09	9.92	168.63	
Range	39.00	34.00	53.00	613.10	
Minimum	3.00	8.00	105.00	459.20	
Maximum	42.00	42.00	158.00	1072.30	
Percentiles					
	25	21.00	20.00	124.00	598.28
	50	27.00	25.00	130.00	726.76
	75	30.00	30.00	137.75	886.42

Table 2: Linear regression results to identify significant independent variables

	Unstandardized Coefficients		Sig. (p-value)	95% Confidence Interval for B	
	Beta	Std. Error		Lower Bound	Upper Bound
(Constant)	-1.99	4.78	0.68	-11.41	7.43
Sun	-15.01	1.00	<0.001	-16.98	-13.05
Mon	6.54	0.96	<0.001	4.64	8.43
Sat	3.81	0.92	<0.001	1.99	5.63
Census	0.25	0.04	<0.001	0.17	0.33
TLOS	-0.01	0.00	<0.001	-0.01	0.00

Dependent Variable: Actual Patient Discharges in Coming 24 hrs

Table 3: Results of logistic regression to compute unadjusted Odds for predicting discharges in next 24 hours

Variables		Actual Next Day Total Discharges		Odds Ratio	95% Confidence Interval		p-value
		≤30 Patients	>30 patients		Lower Bound	Upper Bound	
Census	≤137	131	22	4.89	2.39	9.97	<0.0001
	>137	28	23				
Day of the Week	Weekend (Sat-Mon)	99	18	2.47	1.25	4.87	<0.001
	Weekdays (Tues-Fri)	60	27				
Total LOS	≤886 days	125	28	2.23	1.09	4.54	<0.05
	>886 days	34	17				

As can be observed, out of the 200 available beds around 130 were regularly occupied which shows that around 65% of the total bed capacity was being utilized. Authors questioned that if determinants for predicting discharges can be identified then average number of admissions, based on the accurately predicted number of discharges, can be utilized to ensure throughput of patients across the system. This will ensure utilization of the unused bed capacity without creating any overflow situation. Out of the 204 days included in the study, each of the week days occurred 29 times except for Friday which was 30 in count. Each day of the week is thus adequately represented to rule out any bias or any special days of the week that might skew the distribution of the values of the dependent variables.

As is evident from table 2, weekends, census and TLOS significantly predict the number of discharges in next 24 hours.

Thus, the probability of less than or equal to 30 patients getting discharged is 4.89 times more likely when census is ≤137, 2.47 times more likely if day of discharge is a weekend and 2.23 times more likely if TLOS is ≤ 886 days.

Discussion

The aim of the present study was to identify determinants for predicting discharges for next 24 hours. We found that 85% of the hospital admission and discharge activity in all IPD wards were accomplished between 8 AM through 7 PM. Therefore, this is the ideal time to capture the relevant data for analysis. We found that on an average around 65% bed capacity was being utilized. It is this vacancy that we can try to fill up by predicting discharges and scheduling admissions for the next day.

The primary objective of most hospital admissions scheduling or admissions control systems is to reduce the variance in the daily patient census. Existing bed demand enables hospitals to increase bed occupancy without creating an overflow situation. Literature shows that admission control systems use two different methods to help reduce census variance [3,6,7]. The first method is to wait each day until the number of discharges is known and then to call in an appropriate number of patients from a waiting list. The second method involves prediction of future discharges, combined with the scheduling of patients for admission according to the prediction. Potential benefits of the latter method are substantial.

Such a system can be highly useful for surgery-focused hospitals [9]. Patient can get admitted during the evening one day prior to the scheduled surgery and undergo all preliminary investigation thus saving time on pre-surgery routines. Thus, besides patient and physician satisfaction, scheduling also allows patients to become part of a Pre-Admissions Testing (PAT) program [8].

Mean and median for the 4 variables namely, admissions, discharges, census and TLOS were equivalent in our study showing little dispersion in the data. Furthermore, in our study, census and TLOS played a significant role in determining the number of discharges for next 24 hours. Previous studies have also studied LOS to determine probability of discharge in coming days [10-12]. However, this method involves errors in the associated discharge predictions as shown in previous studies [13]. Attempts to predict hospital discharges or identify determinants are well documented in the literature which is done through either physicians' or nurses' to estimate the date of discharge [14]. With increasing use of Hospital Management Information System studies one can expect increase in such data-intensive researches. However, we could not find any such studies that describes the effect of Census and Total Length of Stay of Admitted Patients on explaining the discharge patterns.

We observed a weekend effect as discharges varies significantly when day of discharge was between Saturday-Monday. Our finding of existence of "Weekend Effect" as a determinant of discharge predictions is corroborated by past studies [4,5]. It has been shown that the day of week significantly affects the admission and discharge patterns in hospitals and that there exist distinctive patterns of admissions and discharges by day of the week. However, there is a little difference in the findings. The past study shows that the day with fewest discharges was always Monday and the day with the greatest number of discharges was always Saturday [4]. Whereas in our study, the day with fewest discharges was always Sunday and the day with greatest number of discharges was always Monday followed by Saturday.

Most of this pattern in our study is a result of hospital policies. Like, surgeries were scheduled only for 5 days per week, insured patient discharges not done on Sundays, patients and/or physicians preferred Monday followed by Saturday as discharge day. Further there exists a tendency to discharge relatively stable patients on Saturday. On Mondays, the above reasons continue to exist in addition to which there is an added pressure to make room for new patients.

The strength of our study is that we attempted to identify the determinants of predicting discharges in India through a highly data-intensive research which captured

data of more than 5000 patients over little less than 7 months. Further, our study adds to the rare Indian studies that have reported 'Weekend Effect' as a determinant of discharge predictions.

Limitation of our study is that while we may predict the total number of patients getting discharged in next 24 hours, one cannot know exactly which patient is going to be discharged. Further, we have not included clinical data and individual patient discharge predictions is not done. Moreover, when a wider variety of data type (clinical and non-clinical) is analysed, one would find more discharge explainers that will increase accuracy of predictions. However, in our study only administrative variables are used to analyse discharge trends.

Nevertheless, our study shows that using the determinants it is possible to predict discharges in next 24 hours.

Conclusion

We conclude, that number of discharges is determined by daily census, TLOS and day of the week. Further, strong 'Weekend Effect' was observed to be a determining factor for discharge prediction. However, future studies should focus on analysing administrative variables combined with clinical variables as determinants for discharge prediction particularly in Indian set up.

Conflict of interest:	All authors declare no COI
Ethics:	There is no ethical violation as it is based on voluntary anonymous interviews
Funding:	No external funding
Guarantor:	Dr. Kasturi Shukla will act as guarantor of this article on behalf of all co-authors.

References

- Phillip PJ, Mullner R, Andes S. Toward a better understanding of hospital occupancy rates. *Health Care Financing Review* 1984 Summer; 5(4): 53-61.
- Bernstein, Samuel J, Mellon WG. *Selected Readings in Quantitative Urban Analysis*. Oxford: Pergamon Press, 1978. <<http://public.eblib.com/choice/publicfullrecord.aspx?p=1874502>>.
- Griffith JR, Sahney VK, Mohr RA. *Reengineering health care: building on CQI*. Health Administration Press, Ann Arbor, Mich, 1995. <<http://trove.nla.gov.au/work/31478974>>
- Lew I. Day of week and other variables affecting hospitals admissions, discharges, and length of stay for patients in the Pittsburgh area. *Inquiry* 1966; 3(1):3-39.
- McKee M. The weekend effect: now you see it, now you don't [Editorials]. *BMJ* 2016;353:i2750.
- Lave JR, Leinhardt S. The cost and length of a hospital stay. *Inquiry* 13:327, 1976.

7. Ro K. Patient characteristics, hospital characteristics, and hospital use. *Medical Care* 1969; 7:295.
8. Martin JB, Dahlstrom GA, Johnston CM. Impact of Administrative Technology on Acute Care Bed Need. *Health Services Research* 1985 April; 20(1):63-81.
9. McDonald MR, Sathiyakumar V, Apfeld JC, Hooe B, Ehrenfeld J, Obremsky WT, Sethi MK. Predictive factors of hospital length of stay in patients with operatively treated ankle fractures. *Journal of Orthopaedic Traumatology* 2014 Dec; 15(4): 255–258.
10. McCorkle LP. Utilization of facilities of a university hospital: Length of stay in various hospital departments. *Health Services Research* 1966;1(1):91-114.
11. Ro KK. Patient characteristics, hospital characteristics, and hospital use. *Medical Care* 1969;7(4):295-312.
12. Robinson GH, Davis LE, Leifer RP. Prediction of hospital length of stay. *Health Services Research* 1966 Winter; 1(3): 287–300.
13. Fuhs PA, Martin JB, Hancock WM. The Use of Length of Stay Distributions to Predict Hospital Discharges. *Medical Care* 1979 Apr;17(4):355-68.
14. Warner DM. Estimating patient discharge from hospitals using both historical and physician-supplied estimates combined in a cost/accuracy analysis. *Medical Care* 1976;14(7):590-602.





Journal of International Medical Sciences Academy

Second Floor, National Medical Library Building,
Ring Road, Ansari Nagar, New Delhi 110029, India

Instructions to Authors

JIMSA is a multispecialty medical journal that aims to promote interdisciplinary dialogue. We accept manuscripts that may interest physicians researchers, health care workers and postgraduate students in diverse specialties of medical science. Highly technical manuscripts will be suitable for narrow-field specialty journals but not JIMSA. Announcement of breakthrough discoveries, summary of current status, eye-openers and technical innovations are the types of manuscripts that we look for publication. Besides educating our readers we also intend to entertain them by publishing poetry, photographs, essays, paintings, memoirs, historical vignettes, opinions and criticisms that are pertinent to medical science and its practice.

We accept manuscripts various forms to suit different themes. They include:

Original articles

It is suitable for reporting research findings. It should be less than 3000 words and may contain up to 6 illustrations and 40 references. Suggested components of the text include.

Review articles

It is critical summary of a currently relevant issue in medical science or of a rare entity. The article should not read like a textbook chapter. Preferably it should critically analyze diverse views, and synthesize opinions.

Case reports

It suitable to report novel methods employed in diagnosis or management of a single patient or a small group of patients not exceeding 5. Rarities when reported should aim to serve as eye-openers.

Letters to editors

It is suitable to comment on a published article. Such letters should be received within 3 months of publication of the concerned article. However, authors may write anything to the editor that may be of interest to the readers.

Editorial

It is usually the prerogative of the editor. However, anyone may submit unsolicited thought provoking editorials.

Images of medicine

It is suitable to illustrate a rare or important aspect of medical practice.

Clinical and radiological images are appropriate. However, photographs capturing extraordinary human

emotions pertinent to Health care will also be occasionally considered.

Pictorial Essay

It is suitable to tell a story with a series of pictures.

How I do it?

It is suitable to describe as to how an existing method is modified by the author with improved outcome.

Technical innovation

It is suitable to report a new method developed by the author.

Basic and translation science

It is suitable to report findings of animal, cellular or molecular biology experiments that may of relevance to clinical practice.

Hypothesis

It is suitable to discuss an interesting idea which yet to be tested. The idea should have been constructed based on established facts of medical science and it should sound plausible.

Medical Research

It is suitable to discuss issues pertinent to medical research and its methodology.

Medical Education

It is suitable to discuss issues related to medical education and training.

Debates

It is usually commissioned by the editor. Views and counterpoints are presented on a controversial subject matter.

Poetry

Poetry should be pertinent to patient care, maladies, medical ethics, health policies, health education and such topics.

Viewpoint

It is suitable to express a thought provoking opinion on any aspect of health care, health education or health politics.

Drug Profile

It provides pharmacological details and prescription information of newly introduced drugs. Drugs not approved by drug approving agencies such as FDA will also be considered but they should be prominently identified so.

Association News

Announcements and news pertinent to International Medical Sciences Academy

Medical News

A summary of important global news pertinent to medical practice.

Historical vignettes

It is suitable to record moments in the history of Medicine, biographies of great personalities, history of great institutions evolution of diseases and their treatments

Book review

Critical evaluation of newly published books pertinent to medical sciences.

Grand rounds

Detailed analytical description of a patient highlighting learning points.

Obituaries

Announcement of death of members and fellows of International Medical Sciences Academy with a brief appreciation of their contribution to medical science and patient care. Occasionally editor may commission obituaries of non-IMSAs members who have made great discoveries or innovations.

Manuscript Preparation

American English is the official language of JIMSA. JIMSA subscribes to the "Uniform Requirement of Biomedical Manuscripts" proposed by International Committee of Medical Journal Editors (ICMJE) and World Journal of Medical Editors". Detailed instructions can be accessed from ICMJE website <http://www.icmje.org/icmje-recommendations.pdf> Manuscript limits prescribed by JIMSA can be downloaded from the JIMSA manuscript requirements. Title page should contain Title of the work, type of manuscript and list of authors in the order of decreasing importance. For each author full name, designation or institutional affiliation, email address and phone number must be provided. In addition to this full postal address, email Address, phone numbers and FAX numbers of corresponding author must be provided. Corresponding author and guarantor of the manuscript should be clearly identified. Statistics regarding the number of text words, number of references, number of illustrations (color and black-white) should also be included in the Title page. Other than title page author name or other identifiable details should not appear in text pages. All the text portions of the manuscript as well as tables and legends should be submitted as Microsoft Word files. All figures should be submitted as JPEG or TIFF files. PDF, Excel or Microsoft PowerPoint submissions will not be accepted. Photographs and illustrations should be of minimum 3x5 inches in size with a minimum resolution

of 600 dpi.

Manuscript Submission

JIMSA no longer accept hard copies of manuscripts. All submissions should be made electronically by email attachment and sent to npseditorjimsa@gmail.com

Signed Author declaration forms may be scanned with 300 dpi resolution and sent by email attachment. Alternatively they may be sent as hard copies to the postal address of the editor-in-chief at

N. P. Singh,

Editor-in-chief, JIMSA,
2nd Floor, National Medical Library Building,
Ansari Nagar, Ring Road, New Delhi 110029
Tel. : 011 - 26588226, 26589660

Email: npseditorjimsa@gmail.com

Manuscript Processing

All submitted manuscripts will be assigned with a reference number and it will be communicated to the corresponding author by email. This number should be quoted in all future communications pertinent to the manuscript. The editorial team will scrutinize the submitted manuscript and decide if it is suitable for JIMSA. Manuscripts considered inappropriate shall be rejected without peer review within 7 working days.

Those manuscripts that survive in-house scrutiny shall be sent to external peer reviewers. Usually opinion from 1 to 3 reviewers will be solicited depending upon the type of manuscripts. Based on the review comments editor will take any one the following decision:

Rejection

Articles considered unsuitable for publication on the basis of peer review will be rejected within 16 weeks.

Major modification

These manuscripts require re-drafting of a considerable portion of text or tables. After major modification the article will be again sent for peer review with feedback of corrections made. They are acceptable only when recommended by second time peer reviewing.

Minor Modifications

Correction of spelling or grammatical errors, point of concern clarifications and deletion of few text portions or illustrations comprises minor modification. The manuscript is acceptable if authors agree to do the changes.

Acceptance

This decision indicates the manuscript is accepted for publication yet may be subjected to copyediting by editorial team. Editor reserves the right to copyedit all

accepted manuscripts to maintain uniformity of style. However, copy edited manuscripts shall be sent to authors for final approval in the form of galley proofs.

Authors should respond to queries and requests of modifications within 6 weeks lest the manuscript will be considered as fresh submissions.

Letters to editor, poetry, images of medicine, book reviews, obituaries, medical news, association news, editorials and viewpoints are usually not peer reviewed and they are accepted at the discretion of editor-in-chief. All other manuscripts shall be externally peer reviewed.

JIMSA do not charge any processing fee for peer reviewing of manuscripts or publishing the final accepted form. However the authors may be asked to bear the cost of reproducing color photographs, lets they will be published in black-white.

Post-publication

Authors shall be provided with PDF copy of their article upon publication of the same. Additional reprint copies can be purchased at rates quoted in JIMSA subscriptions. Comments and criticism of readers shall be considered for publication as post-publication peer review. They will be sent to authors for necessary clarifications or rebuttal. The comments of readers as well as the authors shall be published together.

Plagiarism

Plagiarism of any kind will be viewed seriously and appropriate disciplinary action will be taken. Authors are advised to be wary of inadvertent plagiarism by copy-pasting of texts from internet or other source. Paraphrasing is recommended to avoid unnecessary accusation.

Conflicts of Interest

Each and every author of a manuscript should mandatorily disclose all details that could have actually or potentially influenced judgment, interpretation or conclusion of their work. This includes financial grants received from industry, nepotism, bonding clause between employer and authors, marketing of products

and such concerns. For details consult ICMJE/WAME recommendations. <http://www.wame.org/about/conflict-of-interest-inpeer-reviewed-medical>

Policies

JIMSA subscribes to the ethical standards of medical publishing promulgated by International Committee of Medical Journal Editors (ICMJE) and World Association of Medical Editors (WAME). JIMSA periodically

changes its policies in resonance with updates of these organizations. Updated policies of these organizations can be accessed from

WAME: <http://www.wame.org>

ICMJE: <http://www.icmje.org>



Author Declaration & Publication Agreement

Name of the corresponding author: _____

Title of the manuscript: _____

Contact details of the corresponding author: _____

Postal address _____

Email address _____ Telephone _____

By signing this document the authors of the above mentioned manuscript agree to transfer exclusive publishing and distributing rights of the above mentioned work to the Journal of International Medical Sciences Academy (JIMSA) without any precondition.

By signing this document authors of the work also agree to the following stipulations:

1. Authors retain the copyright of their work. They may reuse their work for academic purposes provided JIMSA is duly acknowledged by citing the year, volume and page numbers of the version published in the journal. Authors may also share PDF of published version with individual scholars or may post it in their personal or institutional websites. However, mass distribution or any commercial (forprofit) usage of articles either in print or electronic form mandates prior permission of JIMSA editorial board.
2. JIMSA reserves the right to publish the work in any form or medium including print and electronic (online or offline) in such quantities as deemed essential for distribution of the article around the globe. JIMSA also reserves the right to republish, translate or reprint the articles as and when required without any timeframe. However JIMSA shall not alter any content of the article without prior permission of the authors.
3. JIMSA shall not pay any royalty for the first-time publication of the work or limited reprint of the article. However a royalty of 30% shall be payable to the corresponding author if the reprint sale of the authors' single article exceeds Rs.5000 in any one financial year (April to March).
4. The authors warrant that the work is an original contribution and they have full control over the original data. The authors also warrant that this work has neither been published elsewhere nor been submitted simultaneously to another journal irrespective of the language of publication or geographic territory of the publisher. Except being presented orally in conferences and as abstract in conference proceedings the article should not have been published in print or electronic media (both online and offline) of any language. Violation of this clause will be construed as self-plagiarism (duplicate publication) and will attract appropriate disciplinary action.
5. The authors of the present work warrant that the work contains no material that would infringe the copyright or intellectual property rights of another author or publisher. Plagiarism will be viewed very seriously and when detected appropriate disciplinary action will be taken. Authors are responsible for obtaining permission from copyright owners for legitimate reuse of illustrations or text. JIMSA shall not be held responsible for any copyright violation committed by authors and any legal proceeding should be defended by the authors on their own. When reusing materials from other sources authors are encouraged to acknowledge the original source and provide the journal with a copy of written permission from the copyright holders.
6. The article shall not contain any material that contravenes any law including but not limited by law of defamation and contempt of court.

7. The article should contain or reflect data and photographs that are genuine. Deliberate manipulation of data or photographs will be viewed seriously and editor reserves the right to take appropriate action.
8. Authors should fulfill the authorship eligibility criteria of ICMJE and WAME. Corresponding author shall be responsible for ensuring appropriate credit of authorship to various members of their team. JIMSA shall not entertain any authorship dispute after acceptance of the article for publication. JIMSA strongly denounces gift authorship and ghost authorship.
9. Authors agree to fully indemnify JIMSA and its editor in respect of all costs, liabilities, damages and expenses of whatsoever nature incurred by publishing the article.
10. In suspected scientific misconduct JIMSA reserves the right to inspect original raw data or other materials deemed necessary to establish facts. In suspected or proven scientific misconduct editor of JIMSA reserves the right to take any one or more of the following disciplinary action: (1) publish a note of concern within the pages of JIMSA; (2) Publish a open reprimand within the pages of JIMSA; (3) inform the head of authors' institution or funding agency or scientific integrity office recommending disciplinary action; (4) retract the publication; (5) reject article that are already accepted for publication; (6) blacklist the authors indefinitely or for a specified period.
11. If and when mutually agreed by the authors and JIMSA, the authors shall undertake to pay the cost of printing, color photographs, article processing charges, cost of publishing supplementary materials and such items.
12. If the accepted manuscripts are not published within 12 months from the date of signing this document, this agreement shall be considered null and void. However, JIMSA shall not be held responsible for publication delay due to any reason.
13. Authors reserve their right to withdraw their manuscript at any stage before final acceptance. Similarly authors may also opt to withdraw their work if it is not published within 12 months of final acceptance. However when the article is accepted after peer review and pending for publication authors cannot withdraw the manuscript without valid reason and the editor's decision shall be final in this matter.
14. Authors shall declare potential and actual conflicts of interest (both financial and non-financial) that could have directly or indirectly biased interpretation or conclusion of their work.
15. Corresponding author shall act as guarantor of the article and he/she shall be responsible for any dispute that may arise by publishing the article. The corresponding author shall also represent all other coauthors in case of any dispute redressal. Although communications are usually done with the corresponding author, editor of JIMSA reserves the right to directly contact any of the coauthors in cases of suspected scientific misconduct or disputes.

I agree with the stipulations noted above and sign this document on behalf of all my co-authors

Signature of the corresponding author and guarantor _____

Name of the corresponding author and guarantor _____

Date of signing the agreement _____

For the use of Editorial office:

Date of submission

Date of acceptance

Date of publication

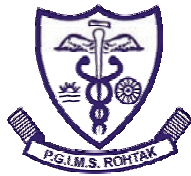
Year/ Volume/ issue

Copyright Permissions

Declaration of COI

Payment of Publication cost

Editor's notes



8th Dr. R. R. Thukral Midterm IMSA Conference 2020

18th -19th April 2020

Theme : "Affordable Health Care: Challenges and Future Prospects."

**Pt. Bhagwat Dayal Sharma,
Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India**

Dear Fraternity,

We welcome you all!

It is an honour for us to organize the **8th Dr. R. R. Thukral Midterm IMSA Conference 2020** on **18th-19th April 2020** at **Pt. B. D. Sharma PGIMS, Rohtak, Haryana, India**. Theme of the Conference is **"Affordable Health Care: Challenges and Future Prospects."**

About the Conference

This international conference is another source of updating current knowledge on healthcare. It aims to meet the needs of contemporary medical education system and to consistently improve professional medical competence with emphasis on interactive learning, using multiple methods of instructions for small groups of professionals from various disciplines which is more likely to change attendees' knowledge and behavior.

We look forward to your esteemed presence in this conference and hope that the members will enjoy their time in this academic institution with all of us.



About the Institute

Pt. B. D. Sharma PGIMS, Rohtak has a glorious and illustrious history. It has grown by leaps and bounds since its inception to become the epicenter for medical education, research and patient care in the region. A truly pulsating campus life is the hallmark of PGIMS, Rohtak, Haryana, India

Program Highlights

- Guest Lectures
- Plenary Sessions
- Panel Discussion
- Scientific Sessions – (Oral/Poster Presentation)
- PG Quiz
- Cultural Events

Call For Abstracts

Academicians, public health specialists and medical fraternity can submit abstracts for oral/poster presentation (Word limit - 300).

Format: Title, Authors and affiliation (Name, Designation, Institute), Background, Aims and objectives, Methodology, Results, Conclusion, Keywords.

Submit your abstract online at the **conference website: www.imsamidterm2020.com**

Last date for abstract submission - **31st January, 2020.**

Conference Secretariat:

Dr. Ramesh Verma, Organizing Secretary & Professor, Department of Community Medicine, Pt. B. D. Sharma PGIMS, Rohtak, Haryana, India

E-mail: imsaconference2020rohtak@gmail.com **Phone:** (+91) 01262-282471, 282635, 282632, 281303 (Extn: 2597, 2315)

Website: www.imsaonline.com www.imsamidterm2020.com



8th Dr. R. R. Thukral Midterm IMSA Conference 2020

18th -19th April 2020

Theme : "Affordable Health Care: Challenges and Future Prospects."

Pt. Bhagwat Dayal Sharma,
Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India

Registration Details

For Indian Delegates

Category	Till 31 st January, 2020 (Early Bird)	1 st February - 29 th February, 2020	Spot Registration**
IMSA Members	Rs. 3500	Rs. 4000	Rs. 4500
Non IMSA-Members	Rs. 4000	Rs. 4500	Rs. 5000
Postgraduate Students*	Rs. 3000	Rs. 3500	Rs. 4000
Undergraduate Students	Rs. 2000	Rs. 2200	Rs. 2500
Co-Delegates**	Rs. 2000	Rs. 2200	Rs. 2500

For Foreign Delegates

Category	Till 31 st January, 2020 (Early Bird)	1 st February - 29 th February, 2020	Spot Registration**
IMSA Members	US \$ 200	US \$ 250	US \$ 300
Non IMSA-Members	US \$ 250	US \$ 300	US \$ 350
Co-Delegates**	US \$ 100	US \$ 150	US \$ 200

*Postgraduate students should submit a proof or recent ID card.

**For spot registrations and co-delegates conference kits will not be given.

To register online, please visit the conference website: www.imsamidterm2020.com

Bank Detail

Account Name : Society of Medical Sciences
Account Number : 39003518147
IFSC Code : SBIN0004735
Bank : State Bank of India (SBI)
Branch : Medical College, Rohtak, Haryana (India)

For Queries Kindly Contact

Dr. Gopal Kumar: 9534322318

Dr. Navraj Tiwana: 9992473022

Conference Secretariat:

Dr. Ramesh Verma, Organizing Secretary & Professor, Department of Community Medicine, Pt. B. D. Sharma PGIMS, Rohtak, Haryana, India

Phone: (+91) 01262-282471, 282635, 282632, 281303 (Extn: 2597, 2315)

E-mail: imsaconference2020rohtak@gmail.com

Website: www.imsaonline.com www.imsamidterm2020.com

Conference Secretariat:

Dr. Ramesh Verma, Organizing Secretary & Professor, Department of Community Medicine, Pt. B. D. Sharma PGIMS, Rohtak, Haryana, India

E-mail: imsaconference2020rohtak@gmail.com Phone: (+91) 01262-282471, 282635, 282632, 281303 (Extn: 2597, 2315)

Website: www.imsaonline.com www.imsamidterm2020.com



IMSACON

Mumbai, India
November 6 & 7 2020
Medicine & Beyond

First Announcement

Dear All,

We would like to invite you all to the vibrant city of Mumbai and Navi Mumbai during “**IMSACON 2020**”. International Medical Sciences Academy (IMSA) is holding its **39th Annual Conference** at the prestigious campus of **Terna Medical College, Hospital and Research Centre**, Nerul West, Navi Mumbai.

It's campus houses 5 premier institutes which are as below –

- 1) Terna Medical College, Hospital & Research Centre,
- 2) Terna Dental College
- 3) Terna Engineering College
- 4) Terna Physiotherapy College
- 5) Terna Nursing college under the heading of Terna Public Charitable Trust (TPCT) which is initiated by our Patron the Honorary Dr Padmasinghji Patil, Ex Home Minister of Maharashtra State and National Congress Party's senior most leader in Maharashtra State.

Our institute was founded in 1991 and is affiliated to Maharashtra University of Health Sciences (MUHS), Nashik for its admissions and is a Medical Council of India (MCI) Recognized Undergraduate & Postgraduate Institute of excellence.

This conference will focus on research and developments in various specialties through invited plenary lectures, symposia, workshops, invited sessions and oral and e-poster sessions from the active participants.

It is aimed to promote continuous medical education and encourage a nourishing exchange of facts and ideas in how to deal with various disorders involving patients on an International Platform.

There will be many International, National Faculties from various disciplines participating in this Academic feast and sharing their vast experiences.

Join us for two most extensive and interesting days of discussing contemporary multidisciplinary subjects and Patient Care research by stalwarts in Medical Education and Health care Delivery.

We would like to invite you to contribute and help us to shape the conference through submissions of your research abstracts, papers and e-posters.

Also, high quality research contributions describing original and unpublished results of conceptual, constructive, empirical, experimental, or theoretical work in all areas of medicine are cordially invited for presentation at the conference.

There will be also scientific exhibition stalls, delicious food cuisine options of local Mumbai and arrangement of local sight- seeing tours for the family members and delegates both so as to make “**IMSACON 2020 MUMBAI**” a truly memorable experience overall.

Dr. Dnyanesh M. Belekar

Conference Secretariat:

Dr. Dnyanesh M. Belekar, Dept. of General Surgery, Terna Medical College, Hospital and Research Centre, Nerul (W), Navi Mumbai. **Mobile:** +91-9820055482, **e-mail:** dnyanesh1475@gmail.com

Website: www.imsaonline.com



IMSACON

Mumbai, India
November 6 & 7
Medicine & Beyond

First Announcement

Conference Venue:

Terna Auditorium, Terna Medical College, Hospital and Research Centre, Nerul (W), Navi Mumbai, Maharashtra, India



Terna Medical College



Terna Specialty Hospital & Research Centre

Registration Charges (Without Accommodation):

Sr. No.	Category	IMSA Members (Rs.)	IMSA Non Members Rs.	Foreign Delegates (US Dollars)
1.	Early Bird till 31 st March 2020	6000	7000	175
2.	1 st April to 31 st July 2020	7000	8000	200
3.	1 st August to 30 th October 2020	8000	9000	225
4.	At Venue/On Spot	9000	10000	250
5.	Banquet/Gall Dinner (on 6 th November)	1500	2000	50

These Charges include:

- 2 days Conference & CME Fee
- All Breakfast, Lunches and High Tea on 6th & 7th
- Entry to Trade/Scientific Stalls
- Delegate Kit & Participation/Presentation Certificates
- Accommodation & Local Travel/Sight Seeing details will be shared Soon.
- **Account Details:**

Dean, TMC-CME Fund

Ac No.: 564302010007680; IFSC Code: UBIN0556432

Union Bank of India, F-009, Nerul Station Commercial Complex,
Nerul (West), Navi Mumbai, Maharashtra, Pin - 400706, India.

Conference Secretariat:

Dr. Dnyanesh M. Belekar, Dept. of General Surgery, Terna Medical College, Hospital and Research Centre, Nerul (W), Navi Mumbai. **Mobile:**+91-9820055482, **e-mail:** dnyanesh1475@gmail.com

Website: www.imsaonline.com

Subject Index

A			
A Comparative Study between Isoflurane and Propofol in Fast Track Cardiac Anaesthesia for Patients Undergoing Coronary Artery Bypass Grafting.	95	Immediate Ambulation, Alimentation is the Key to Abolish Adynamic Ileus : Our Surgical Experience of Past 10 Years	35
A Comparative Study of Propofol, Etomidate and 50% Admixture of Etomidate and Propofol for Induction in General Anaesthesia.	79	Intergrated Clinical Approach on an Atypical Case of Pemphigus Vulgaris – A Dental Professional's Role.	185
A Rare Case of Portal Hypertension.	113	Is Non - Alcoholic Fatty Infiltration of Pancreas - A Precursor of Diabetes Mellitus?	13
A Study of Risk Factor Profile and Pattern of Coronary Artery Involvement in ACS in young patients	144	Is Whole Spine Sagittal MR Image Imperative for Reporting of Dorsolumbar MR Spine Examination?	39
Abdominal Vascular Compression Syndromes and Imaging Features.	237	L	
Analysis of Adverse Events in the Perioperative Period in a Tertiary Care Hospital.	87	Lymphoscintigraphic Evaluation of Lymphatic Function in both Men and Women for early Diagnosis and Management of Filariasis and Congenital Lymphatic Edema	53
Artery of Percheron Infarction: A case report with review of literature	41	M	
Arthroscopic Management of Primary Synovial Chondromatosis	151	Magnetic Resonance Imaging Findings in a case of Amyotrophic Lateral Sclerosis	47
Assessment of Dietary Intake and Food Consumption among Medical Students of Preclinical Year in Government Medical College of North India	161	Mucormycosis of Maxilla: A Multifarious Disease: A Report of Two Cases.	177
Assessment of Knowledge, Attitude and Perception regarding Tuberculosis amongst Medical Students of Government Medical College of North India.	164	N	
C		Naso - Gastric Tube (NGT) Syndrome in a patient with Polycythemia with Stroke in Neuro - ICU	49
Changing Trends in Anaesthetic Management: Food for thought...	72	Non Alcoholic Fatty Infiltration of Pancreas: A New Metabolic Risk Factor	9
Co-Existent Hodgkin's Lymphoma and Tuberculosis: A Rare Case Report.	181	O	
Comparison of Ondansetron, Metoclopramide and Dexamethasone for PONV Prophylaxis in Laparoscopic Surgeries.	73	Our Experience with 782 Patients Over a Period of 4 Years with India's First Coronary Care Ambulance	23
D		P	
Determinants for predicting number of discharges in a tertiary care hospital	245	Post - Traumatic Pigmented Villonodular Synovitis of Tibialis Posterior Tendon Sheath - A Case Report.	125
DREEM: (Dundee Ready Educational Environment Measure) To assess the Educational Environment in a Government Medical College in Dehradun.	168	Premedication with a Combination of Ketamine and Midazolam in Pediatric Cardiac Surgical Patients : A Comparison of Nasal versus Oral Route.	100
Duplication of Male Urethra: A Case Report with Review of Literature	45	Prenatal Diagnosis of Hemimegalencephaly: A case report with review of literature.	51
Dyke – Davidoff - Masson Syndrome : A Case Report.	111	Prevalence of Tools of Digital Communications among Population: A ground study in tribal, rural and urban slum	155
E		R	
Effectiveness of Ultrasound Biomicroscopy (UBM) in ensuring success in secondary IOL implantation	241	Radiological Perspectives in Non Syndromic Multiple Odontogenic Keratocysts : Report of Two Cases and Review of literature	189
End Stage Renal Disease (ESRD) : Is it Reversible?	107	Randomized Controlled Study to Evaluate Comparative Efficacy of Intrathecal Clonidine and Dexmedetomidine as Adjuvants to Hyperbaric Bupivacaine for Spinal Anaesthesia for Lower Limb Surgeries	231
Entero-Uretero-Cutaneous: A Case Report with Review of Literature.	128	Role of Carotid Doppler and Coronary CT Angiography as Predictors of Coronary Artery Disease in Patients of Acute Stroke	27
Epidemiological knowledge on HIV infection as a basic for programme of prophylactic measures	218	S	
Estimation of Anamnesis and Gestation Course, Complicated with Premature Discharge of Amniotic Fluids	214	Systemic Sclerosis: A case report with review of literature.	174
F		T	
Fetal kidney length as a parameter for determination of gestational age in Second trimester of pregnancy	227	To study factors influencing Neurological Outcome, Fusion Rates and Complications in Traumatic Odontoid Fractures – Non Randomized Ambispective Study	208
H		W	
HCRT Evaluation on H1N1 Pneumonia	222	Wilson's Disease - MR Imaging : A Case Report from Rural Medical College with Review of Literature.	122
'Humming Bird Sign', 'Mickey Mouse Sign', and 'Morning Glory Sign' in progressive supranuclear palsy.: A Case Report with review of literature.	43		
I			
Imaging Spectrum of Posterior Cranial Fossa Pathologies: A Pictorial Essay.	15		

Author Index

A		Jena Salil	208	Puri Nidhi	227
Adhikari Tulsi	155	Jiten K. H.	155	R	
Arafath Hameed	15, 47, 237	K		Rajendra	45
Arkhipov George Sergeevich	218	Kalekar Tushar Madhavrao	222	Ramakanth V.	128
Aswini	122	Kalirathinam S.	23, 35	Raman Ratish Kumar	13,39
Azovtseva Olga Vladimirovna	218	Kaur Gurleen	9	Rao Vishnu V.	155
B		Khan Masroof H.	161,164,168	Rappai TJ	208
Bansal S.	144	Khullar Sachin	125	Rastogi Rajul	13, 27,39
Bariar Hardeep	231	Korath M. Paul	107	Rathod Amishi	49
Bedi Col. (Dr.) P. S.	95, 100	Kumar Anil	208	Rathod Nitin	49
Bhargavi Manju	15,41	Kumar Lt. Col. Dheeraj	73	Rathore Vikram Singh	79
Bhaskar Y. Hemavathy	189	Kumar Major (Dr.) Praveen	95	Reddy Bollareddy Srinivasa	111
Bhatt Sakshi	161,164,168	Kumar Neeta	155	Reddy S.	43
C		Kumar Parmod	231	Reddy Srinivasa B.	237
Chaitanya Viswa C.	47, 51	Kumar R. Ramesh	174	Richa B Naik	241
Chandra Hem	161,164,168, 245	Kumar Ramesh	15, 122	Ruchi	161,164,168
Chauhan A.	144	Kumari Priti	241	S	
Chauhan Lt. Col. Ravindra	151	L		Sadiq Shaik	15
Chhetri Charu	161,164,168	Lt. Col. Prasenjeet	151	Saini R. P.	144
D		Luther Neelu	227	Shah K. C.	49
D. Maj. (Dr.) Harsha	87	M		Shamkhalova Izzet Arif	214
Dhejasvee R.	107	Maheshgauri Rupali	241	Shan M.	49
Dhir Rakesh	113	Maj. Deeparani	87	Sharma Amit	79
Dinakar Vivek Patnam	87	Mallikarjunappa B.	15,41,43, 45,47, 51,111,122, 128, 174, 237	Sharma R. S.	155
G		Mittal Amit	227	Shah Nirmal	245
Garg Sahil	231	Mohandas K.	107	Shukla Kasturi	245
Ghai Col. Amresh	151	Mounika V.	43	Singh Brig Amarjit	222,241
Giri Kajaree	181	N		Singh Col. (Dr.) Ajit Kumar	87, 95,100
Gopal Parikshat	79, 151, 208	Nambiar Col. Balachandran	72,73,87,95	Singh Lt. Col. (Dr.) Archana	95 ,100
Gupta Anish Kumar	9	Nath Bhola	161,164,168	Singh Manish Raj	13 39
Gupta B.	144	Naval Chesta	155	Singh Manjeet	231
Gupta Neeru	155	Nivethitha N.	185	Singh Narinder Pal	9
H		P		Singh V. K.	27
Huguenin Leesa	125	Pahwa Maj. (Dr.) Bhawna	87	Sinha Pragya	27
I		Panicker T. M. R.	53	Sood Lt. Col. Munish	151
Ibragimova Nigar Adalat	214	Pari S Desai	241	Sood Lt. Col. Nikhil	151
J		Parvez Arshad	45	T	
Jagadeesan K.	23, 35, 53, 107	Patil Abhijit Mahaveer	222	T. M. Rajendra	174
Jagadeesan Kesav	23, 35, 107	Pattnaik Shivani P.	241	Tamilselvi R.	53
Jain Deepak	181	Prabu C.	23,35	Tiwari Meenakshi N. Nidhi	155
Jain Promil	181	Prasad Shashi Prabha	241	V	
Jani K. K.	155	Pratap Vijai	27,39	Venkataraman N. B.	35
Jayachandran S.	177,185,189	Priya Amgoth Banu	113	Vidya Jayaram	177,185,189



JIMSA is Indexed with the following agencies:

**IndMED-Database, Excerpta Medica, Embase, Google
Scholar, Bibliographic Database
and
Indian Science Abstracts**

**Indian S & T Journals in
International Indexing and Abstracting**

**640 Journal of
International Medical Sciences Academy
ISSN 0971-071X Year 1987+**

**Coverage in
I & A Service - Scopus & Embase**

NLM ID: 9425946 (Serial), Me SH: Clinical Medicine;

**Notes: Description based on Vol 2 No 3 (July-Sept 1989);
Other ID: (DNLM) SR0069157 (s).**



IMSACON 2020, MUMBAI
NAVI MUMBAI, INDIA

IMSACON

Mumbai, India **2020**
November 6 & 7
Medicine & Beyond



Conference Secretariat:

Dr. Dnyanesh M. Belekar, Dept. of General Surgery, Terna Medical College, Hospital and Research Centre, Nerul (W), Navi Mumbai. **Mobile:**+91-9820055482, **e-mail:** dnyanesh1475@gmail.com

www.imsaonline.com