Call for Editorial Board Members

As you are well aware that we are a medical and health sciences publishers; publishing peer-reviewed journals and books since 2004.

We are always looking for dedicated editorial board members for our journals. If you completed your master's degree and must have at least five years experience in teaching and having good publication records in journals and books.

If you are interested to be an editorial board member of the journal; please provide your complete resume and affiliation through e-mail (i.e. info@ rfppl.co.in) or visit our website (i.e.www.rfppl.co.in) to register yourself online.

Call for Publication of Conference Papers/Abstracts

We publish pre-conference or post-conference papers and abstracts in our journals, and deliver hard copy and giving online access in a timely fashion to the authors.

For more information, please contact:

For more information, please contact:
A Lal
Publication-in-charge
Red Flower Publication Pvt. Ltd.
48/41-42, DSIDC, Pocket-II
Mayur Vihar Phase-I
Delhi – 110 091 (India).
Phone: 91-11-79695648
E-mail: info@rfppl.co.in

Free Announcements of your Conferences/Workshops/CMEs

This privilege to all Indian and other countries conferences organizing committee members to publish free announcements of your conferences/ workshops. If you are interested, please send your matter in word formats and images or pictures in JPG/JPEG/Tiff formats through e-mail attachments to sales@rfppl.co.in.

Terms and Conditions to publish free announcements:

1. Only conference organizers are eligible up to one full black and white page, but not applicable for the front, inside front, inside back and back cover, however, these pages are paid.
2. Only five pages in every issue are available for free announcements for different conferences.
3. This announcement will come in the next coming issue and no priority will be given.
4. All legal disputes subject to Delhi jurisdiction only.
5. The executive committee of the Red Flower Publication reserve the right to cancel, revise or modify terms and conditions any time without prior notice.

For more information, please contact:
A Lal
Publication-in-charge
Red Flower Publication Pvt. Ltd.
48/41-42, DSIDC, Pocket-II
Mayur Vihar Phase-I
Delhi – 110 091 (India).
Phone: 91-11-79695648
E-mail: info@rfppl.co.in

Win Free Institutional Subscription!

Simply fill out this form and return scanned copy through e-mail or by post to us.

Name of the Institution_____
Name of the Principal/Chairman_____
Management (Trust/Society/Govt./Company)_____
Address 1_____
Address 2_____
Address 3_____
City_____
Country_____
PIN Code_____
Mobile_____
Email_____

We are regular subscriber of Red Flower Publication journals.

Year of first subscription_____

List of ordered journals (if you subscribed more than 5 titles, please attach separate sheet)

Ordered through

Name of the Vendor	Subscription Year	Direct/subs Yr

Name of the journal for which you wish to be free winner

Terms and Conditions to win free institutional subscription

1. Only institutions can participate in this scheme
2. In group institutions only one institution would be winner
3. Only five institutions will be winner for each journal
4. An institution will be winner only for one journal
5. The free subscription will be valid for one year only (i.e. 1 Jan – 31 Dec)
6. This free subscription is not renewable, however, can be renewed with payment
7. Any institution can again participate after five years
8. All legal disputes subject to Delhi jurisdiction only
9. This scheme will be available to participate throughout year, but draw will be held in last week of August every year
10. The executive committee of the Red Flower Publication reserve the right to cancel, revise or modify terms and conditions any time without prior notice.

I confirm and certify that the above information is true and correct to the best of my knowledge and belief.

Place: Signature with Seal
Date:

Revised Rates for 2022 (Institutional) Title of the Journal	Frequency	India(INR) Print Only	India(INR) Online Only	Outside India(USD) Print Only	Outside India(USD) Online Only
Community and Public Health Nursing	3	6000	5500	469	430
Indian Journal of Agriculture Business	2	6000	5500	469	430
Indian Journal of Anatomy	4	9000	8500	703	664
Indian Journal of Ancient Medicine and Yoga	4	8500	8000	664	625
Indian Journal of Anesthesia and Analgesia	6	8000	7500	625	586
Indian Journal of Biology	2	6000	5500	469	430
Indian Journal of Cancer Education and Research	2	9500	9000	742	703
Indian Journal of Communicable Diseases	2	9000	8500	703	664
Indian Journal of Dental Education	4	6000	5500	469	430
Indian Journal of Diabetes and Endocrinology	2	8500	8000	664	625
Indian Journal of Emergency Medicine	4	13000	12500	1016	977
Indian Journal of Forensic Medicine and Pathology	4	16500	16000	1289	1250
Indian Journal of Forensic Odontology	2	6000	5500	469	430
Indian Journal of Genetics and Molecular Research	2	7500	7000	586	547
Indian Journal of Law and Human Behavior	3	6500	6000	508	469
Indian Journal of Legal Medicine	2	9000	8500	703	664
Indian Journal of Library and Information Science	3	10000	9500	781	742
Indian Journal of Maternal-Fetal & Neonatal Medicine	2	10000	9500	781	742
Indian Journal of Medical and Health Sciences	2	7500	7000	586	547
Indian Journal of Obstetrics and Gynecology	4	10000	9500	781	742
Indian Journal of Pathology: Research and Practice	6	12500	12000	977	938
Indian Journal of Plant and Soil	2	7000	6500	547	508
Indian Journal of Preventive Medicine	2	7500	7000	586	547
Indian Journal of Research in Anthropology	2	13000	12500	1016	977
Indian Journal of Surgical Nursing	3	6000	5500	469	430
Indian Journal of Trauma and Emergency Pediatrics	4	10000	9500	781	742
Indian Journal of Waste Management	2	10000	9500	781	742
International Journal of Food, Nutrition & Dietetics	3	6000	5500	469	430
International Journal of Forensic Science	2	10500	10000	820	781
International Journal of Neurology and Neurosurgery	4	11000	10500	859	820
International Journal of Pediatric Nursing	3	6000	5500	469	430
International Journal of Political Science	2	6500	6000	508	469
International Journal of Practical Nursing	3	6000	5500	469	430
International Physiology	3	8000	7500	625	586
Journal of Animal Feed Science and Technology	2	8300	7800	648	609
Journal of Cardiovascular Medicine and Surgery	4	10500	10000	820	781
Journal of Emergency and Trauma Nursing	2	6000	5500	469	430
Journal of Forensic Chemistry and Toxicology	2	10000	9500	781	742
Journal of Global Medical Education and Research	2	6400	5900	500	461
Journal of Global Public Health	2	12500	12000	977	938
Journal of Microbiology and Related Research	2	9000	8500	703	664
Journal of Nurse Midwifery and Maternal Health	3	6000	5500	469	430
Journal of Orthopedic Education	3	6000	5500	469	430
Journal of Pharmaceutical and Medicinal Chemistry	2	17000	16500	1328	1289
Journal of Plastic Surgery and Transplantation	2	26900	26400	1954	575
Journal of Psychiatric Nursing	3	6000	5500	469	430
Journal of Social Welfare and Management	4	8000	7500	625	586
New Indian Journal of Surgery	6	8500	7500	664	625
Ophthalmology and Allied Sciences	3	6500	6000	508	469
Pediatric Education and Research	4	8000	7500	625	586
Physiotherapy and Occupational Therapy Journal	4	9500	9000	742	703
RFP Indian Journal of Medical Psychiatry	2	8500	8000	664	625
RFP Journal of Biochemistry and Biophysics	2	7500	7000	586	547
RFP Journal of Dermatology (Formerly Dermatology International)	2	6000	5500	469	430
RFP Journal of ENT and Allied Sciences (Formerly Otolaryngology International)	2	6000	5500	469	430
RFP Journal of Hospital Administration	2	7500	7000	586	547
Urology, Nephrology and Andrology International	2	8000	7500	625	586
Coming Soon					
RFP Gastroenterology International	2	–	–	–	–
Journal of Food Additives and Contaminants	2	–	–	–	–
Journal of Food Technology and Engineering	2	–	–	–	–
Journal of Radiology	2	–	–	–	–
Medical Drugs and Devices	3	–	–	–	–
RFP Indian Journal of Hospital Infection	2	–	–	–	–
RFP Journal of Gerontology and Geriatric Nursing	2	–	–	–	–

Terms of Supply:

1. Agency discount 12.5%. Issues will be sent directly to the end user, otherwise foreign rates will be charged.
2. All back volumes of all journals are available at current rates.
3. All journals are available free online with print order within the subscription period.
4. All legal disputes subject to Delhi jurisdiction.
5. Cancellations are not accepted orders once processed.
6. Demand draft/cheque should be issued in favour of "**Red Flower Publication Pvt. Ltd.**" payable at **Delhi.**
7. Full pre-payment is required. It can be done through online (http://rfppl.co.in/subscribe.php?mid=7).
8. No claims will be entertained if not reported within 6 months of the publishing date.
9. Orders and payments are to be sent to our office address as given below.
10. Postage & Handling is included in the subscription rates.
11. Subscription period is accepted on calendar year basis (i.e. Jan to Dec). However orders may be placed any time throughout the year.

Order from

Red Flower Publication Pvt. Ltd., 48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi - 110 091 (India).
Mobile: 8130750089, Phone: 91-11-79695648, E-mail: info@rfppl.co.in, Website: www.rfppl.co.in

Indian Journal of Anesthesia and Analgesia

Aims and Scope

The Indian Journal of Anesthesia and Analgesia (IJAA) is official peer-reviewed scientific journal addresses all aspects of anesthesia practice, including anesthetic administration, pharmacokinetics, preoperative and postoperative considerations, coexisting disease and other complicating factors, cost issues, and similar concerns anesthesiologists contend with daily. The Journal seeks a balance between outstanding basic scientific reports and definitive clinical and management investigations. The Journal welcomes manuscripts reflecting rigorous analysis, even if unusual in style and focus.

Readership: Anesthesiologists, Critical Care Physicians and Surgeons.

Office of Publication: Red Flower Publication Pvt. Ltd., 48/41-42, DSIDC, Pocket-II
Mayur Vihar Phase-I, Delhi – 110 091(India), Phone: 91-11-79695648
E-mail: info@rfppl.co.in Website: www.rfppl.co.in

Copyright Information

For Authors

As soon as article is accepted for publication, authors will be requested to assign copyright of the article (or to grant exclusive publication and dissemination rights) to the publisher (respective the owner if other than Red Flower Publication Pvt. Ltd.). This will ensure the widest possible protection and dissemination of information under copyright laws.

More information about copyright regulations for this journal is available at www.rfppl.co.in

For Readers

All the advice and information in this journal are believed to be true and accurate at the date of its publication. Neither the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may have been made. The author is totaly resposible for any error or omission in the article. The publisher makes no warranty, express or implied, with respect to the material contained herein.

All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduced and distribute the article (e.g. as offprints), as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic databases on video disks, etc, without obtaining written permission from the publisher (respective the copyright owner if other than Red Flower Publication Pvt. Ltd.). The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.

Journal Website

http://rfppl.co.in/about_journal.php?jid=24

Subscription Information

The Indian Journal of Anesthesia and Analgesia is published four times a year.

Volume 6 (6 issues) will be published in 2019 pISSN: 2349-8471, eISSN: 2455-6238

For information on subscription rates please contact

Subscription and Marketing Manager
Red Flower Publication Pvt. Ltd.
48/41-42, DSIDC, Pocket-II
Mayur Vihar Phase-I
Delhi - 110 091(India).
Phone: 91-11-79695648
info@rfppl.co.in

The journal is distributed free of cost to members of editorial board. Institutional subscription rates (India) INR 8000 and (other countries) USD586.

All correspondence regarding individual and society subscriptions, subscription rates for 2022 and advertisements should be addressed to: info@rfppl.co.in.

Advertisement

E-mail: info@rfppl.co.in

Disclaimer

Red Flower Publication Pvt. Ltd. publishes advertisement in this journal reliance upon the responsibility of the advertiser to comply with all legal requirements relating to the marketing and sale of products or services advertised. Red Flower Publication Pvt. Ltd. and the editors are not responsible for claims make in the advertisement published in the journal. The appearance of advertisements in Red Flower Publication Pvt. Ltd. publications does not constitute endorsement, implied or intended, of the product advertised or the claims make for it by the advertiser.

The views expressed in this publication do not necessarily reflect those of Red Flower Publication Pvt. Ltd.

Red Flower Publication Pvt. Ltd. do not endorse the quality or the value of the advertised/sponsored products described therein.

INDIAN JOURNAL OF ANESTHESIA AND ANALGESIA

May-June 2022
Volume 9 Number 3

Contents

Original Article

Case Report

Red Flower Publication (P) Ltd.

Presents its Book Publications for sale

1. **Beyond Medicine: A to E for Medical Professionals) (2020)**
   Kalidas Chavan **INR390/USD31**
2. **Biostatistical Methods For Medical Research (2019)**
   Sanjeev Sarmukaddam **INR549/USD44**
3. **Breast Cancer: Biology, Prevention And Treatment (2015)**
   Dr. A. Ramesh Rao **INR 395/USD31**
4. **Chhotanagpur A Hinterland of Tribes (2020)**
   Ambrish Gautam **INR250/ USD20**
5. **Child Intelligence (2004)**
   Dr. Rajesh Shukla, Md, Dch. **INR100/ USD50**
6. **Clinical Applied Physiology and Solutions (2020)**
   Varun Malhotra **INR263/USD21**
7. **Comprehensive Medical Pharmacology (2019)**
   Dr. Ahmad Najmi **INR599/USD47**
8. **Critical Care Nursing in Emergency Toxicology (2019)**
   Vivekanshu Verma **INR460/USD34**
9. **Digital Payment (Blue Print For Shining India) (2020)**
   Dr. Bishnu Prasad Patro **INR329/USD26**
10. **Drugs in Anesthesia (2020)**
    R. Varaprasad **INR449/USD35**
11. **Drugs In Anesthesia and Critical Care (2020)**
    Dr. Bhavna Gupta **INR595/USD46**
12. **MCQs in Medical Physiology (2019)**
    Dr. Bharati Mehta **INR300/ USD29**
13. **MCQs in Microbiology, Biotechnology and Genetics (2020)**
    Biswajit Batabyal **INR285/USD22**
14. **MCQs In Minimal Access & Bariatric Surgery (2019)**
    Anshuman Kaushal **INR450/USD35**
15. **MCQs In Minimal Access and Bariatric Surgery (2nd Edition) (2020)**
    Anshuman Kaushal **INR545/USD42**
16. **Patient Care Management (2019)**
    A.K. Mohiuddin **INR999/USD78**
17. **Pediatrics Companion (2001)**
    Rajesh Shukla **INR 250/USD50**
18. **Pharmaceutics-1 (A Comprehensive Hand Book) (2021)**
    V. Sandhiya **INR525/ USD50**
19. **Poultry Eggs of India (2020)**
    Prafulla K. Mohanty **INR390/USD30**
20. **Practical Emergency Trauma Toxicology Cases Workbook (2019)**
    Dr. Vivekanshu Verma, Dr. Shiv Rattan Kochar, Dr. Devendra Richhariya **INR395/USD31**
21. **Practical Record Book of Forensic Medicine & Toxicology (2019)**
    Dr. Akhilesh K. Pathak **INR299/USD23**
22. **Recent Advances in Neonatology (2020)**
    Dr. T.M. Ananda Kesavan **INR 845/USD66**
23. **Shipping Economics (2018)**
    Dr. D. Amutha **INR347/USD45**
24. **Skeletal and Structural Organizations of Human Body (2019)**
    Dr. D.R. Singh **INR659/USD51**
25. **Statistics In Genetic Data Analysis (2020)**
    S.Venkatasubramanian **INR299/USD23**
26. **Synopsis of Anesthesia (2019)**
    Dr. Lalit Gupta **INR1195/USD75**

Order from

Red Flower Publication Pvt. Ltd.
48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi - 110 091(India)
Mobile: 8130750089, Phone: 91-11-79695648, E-mail: info@rfppl.co.in

Original Article

Indian Journal of Anesthesia and Analgesia
Volume 9 Number 3 May-June 2022
DOI: http://dx.doi.org/10.21088/ijaa.2349.8471.9322.9

A Comparative Evaluation of Dexmedetomidine vs Clonidine used as Adjuvants with Hyperbaric Bupivacaine in Patients with Preeclampsia Undergoing LSCS

Ruchi Tandon[1], Avani Tiwari[2], Antima Singh[3]

Author's Affiliation: [1]Professor, [2]Senior Resident, Department of Anesthesia, Gandhi Medical College, Bhopal 462001, Madhya Pradesh, India, [3]Postgraduate, Deparment of Obstetrician-Gynecologists, Bhagat Phool Singh Medical College, Sonipat 131305, Haryana, India.

Abstract

Relief of operative as well as post operative pain should be the prime responsibility of an anesthesiologists. The most common treatment for post operative pain remains conventional intramuscular injection of narcoticswhich are associated with several side effects like nausea, vomiting, itching, hypotension, bradycardia,urinary retention, dysphoria,respiratory depression, early and later. Pregnancy induced hypertension is a major cause of morbidity and mortality in obstetrics, complicating 3-8% of pregnancies. Severe preeclampsia poses a dilemma for anesthesiologists, and there is some controversy about the best anaesthetic technique for caesarean delivery in such cases. Though spinal anasthesia reduces the risk of airway instrumentation in high risk patients of preeclampsia, there are still limitations about its limited duration of analgesia. In present study we intend to compare dexmedetomidine and clonidine used with hyperbaric bupivacaine for spinal anaersthesiain patients with preeclampsia undergoing LSCS.

Primary Objective: To compare the clinical efficacy of intra the caldexmedetomidine vs Clonidine on: (a) Onset and duration of sensory block (b) Onset and duration of motor block (c) Duration of analgesia (d) Side effects if any.

Secondary Objective: to compare the haemodynamic profile among patients of the two group.

Methodology: All eligible patients were randomly assigned into two groups of 50 each by chit and envelope method: Group A: SAB was given with 2ml, 0.5 % Bupivacaine(H) + 45 µg Clonidine. Group B: SAB to be given with 2ml, 0.5% Bupivacaine (H) + 5µg dexmedetomidine.

Results: Regression of sensory block was prolonged in group B as compared to group A.(p value <0.0001). There was regression of motor block in group B as compared to group A. p value<0.0001Heart rate remained stable and comparable at different time points in 2 groups. Except three patients in group A and one patient in group B, no other patient in either group developed bradycardia. Three patients in group A and in group B developed hypotension which responded to intravenous fluid therapy. Sedation score decreased to 0 within 5 hours. At no time, sedation score exceeded 2 and no patient developed signs of respiratory depression.

***Conclusion*:** Dexmedetomidine in the dose of 5µg added to 10 mg 0.5% Hyperbaric Bupivacaine in SAB for LSCS surgery in parturients with preeclampsia provides comparable onset for sensory and motor blockade but significantly prolonged duration as compared to 45µg of clonidine. Longer duration of postoperative analgesia with 5µg Dexmedetomidine makes it superior to clonidine in respect to postoperative analgesia. Both the drugs produce desirable level of intraoperative and postoperative sedation, stable hemodynamics and minimal side effects.

Keywords: Dexmedtomidine; Clonidine; preeclampsia; spinal anesthesia.

How to cite this article:

Ruchi Tandon, Avani Tiwari, Antima Singh/A Comparative Evaluation of Dexmedetomidine vs Clonidine used as Adjuvants with Hyperbaric Bupivacaine in Patients with Preeclampsia Undergoing LSCS/Indian J Anesth Analg. 2022;9(3):109-115.

Corresponding Author: Avani Tiwari, Senior Resident, Department of Anesthesia, Gandhi Medical College, Bhopal 462001, Madhya Pradesh, India.
E-mail: avnicvc@gmail.com
Received on: 01.04.2022, **Accepted on:** 05.05.2022

Introduction

Relief of operative as well as post operative pain is important because it interferes with respiration, bowel movements and micturition. The most common treatment for post operative pain remains conventional intramuscular injection of one of the strongest analgesics such a morphine, pethidine, pentazocine etc. These parenteral narcotics are associated with several side effects like nausea, vomiting, itching, hypotension, bradycardia, urinary retention, dysphoria, respiratory depression, early and later.[1]

Surgical trauma is real and severe tissue damage and surgical pain is a universal phenomenon which is aggravated by associated muscle spasm and visceral distention. By rendering the patient pain free during surgery, anaesthesiologist have succeeded to a considerable extent, but once the luxury of pain free surgery is over, the patient has to face the misery of post operative pain.

Pregnancy induced hypertension is a major cause of morbidity and mortality in obstetrics, complicating 6-8% of pregnancies.[2] Severe preeclampsia poses a dilemma for anaesthesiologists, and there is some controversy about the best anaesthetic technique for caesarean delivery in such cases. Because of the risks related to airway edema, difficulty with the airway or failed intubation, hypertensive response to direct laryngoscopy, and aspiration pneuminitis, general anesthesia is associated with more untoward outcomes in this particular group of patients. Spinal anaesthesia has the advantage of simplicity of technique, rapid onset of action and reliability in producing uniform sensory and motor bloackade. Its main disadvantage relates to its limited duration of action and hence, lack of long lasting post operative analgesia. To overcome this problem, administration of local anaesthetics in combination with different adjuvants is ana excellent technique which not only relives postoperative pain but also refines the quality of sensory and motor blockade of subarachnoid block and hence, acts as synergistic to local anaesthetics with lower local anaesthetic requirement, decreased side effect and excellent post operative analgesia.

Spinal anaesthesia has the advantage of simplicity of technique, rapid onset of action and reliability in producing uniform sensory and motor blockade. Its main disadvantage relates to its limited duration of action and hence, lack of long lasting post operative analgesia. To overcome this problem, administration of local anaesthetics in combination with different adjuvants is an excellent technique which not only relives postoperative pain but also refines the quality of sensory and motor blockade of subarachnoid block.[1]

Materials and Method

After approval from Institutional Ethics Committee, written informed consent was obtained from all patients. Patients with preeclampsia were drawn frpm those scheduled for operations requiring subarachnoid block for LSCS. 100 ASA I and II patients are randomized into groups using envelope method.

Inclusion Criteria

Full term parturients with Pre-eclampsia scheduled for LSCS.

- Systolic BP >140mm and < 160 mmHg, Diastolic BP > 90mm and < 110 mmHg.
- Proteinuria < 5 gm in 24 hour urine sample or ½+ on dipstick urine test.

Exclusive Criteria

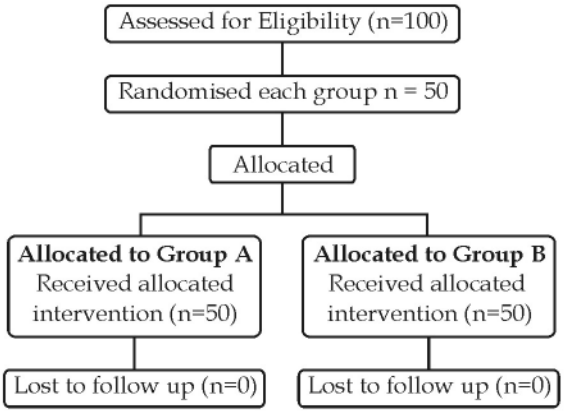
- Patients with severe preeclampsia.
- Height < 147 cm and > 170 cm.
- Weight > 90 kg.
- Patients with local infection, abscess.
- Patients with known local anaesthetic hypersensitivity.
- Patients with coagulopathies.
- Opioid dependence.
- ASA III, IV patients.
- Patients refusal, spinal deformity and any other contraindications to spinal anaesthesia.

All eligible patients were randomly assigned into two groups of 50 each by chit and envelope method: **Group A:** SAB was given with 2ml, 0.5 % Bupivacaine(H) + 45 µg; **Group B:** SAB to be given with 2ml, 0.5% Bupivacaine (H) + 5µg dexmedetomidine.

After Pre-anaesthetic assessment of the patient, patients were explained about the procedure, consents were taken. Inside the OT multi-para monitoring was done. A venous access was secured using 16 or 18G cannula and the patient was preloaded with ringer lactate (15-20 ml/kg) before the induction of spinal anaesthesia. SAB will bw performed at L3-4 or L4-5 intervertebral space with the patient in sitting and lateral decubitus position under complete asepsis a disposable 25G spinal Quincke needle. Our study was doubly blinded, both the observer and the patient were not informed abouth the drug combinations. Total

volume of drug injected was 2.3 ml in each group. The onset of sensory block was recorded using Hollmen scale. (Time zero to Hollmen scale to reach T6 level) The onset of motor block was evaluated using the bromage scale.[3] (Time zero to bromage scale grade 4). If hypotension occurs (systolic blood pressure lower than 20% of baseline value), it was treated with 5 mg boluses of intravenous ephedrine. Injection atropine 0.6 mg intravenous was administered if bradycardia (HR<50 beats per minute) occurs. Oxygen was administered through simple facemask at 5 L/min. Side effects such as hypotension (SBP < 20% of the initial value), bradycardia (HR<50 bpm), nausea, vomiting, dry mouth, pruritus and shivering will be recorded.

Consort Diagram



Results

The present study included 100 patients. Patients characteristics in terms of age and weight were comparable in both the groups (p > 0.05).

Table 1: Showing Comparison of Sensory Characteristics of Subarachnoid Block Between two Groups.

Variables	Group A	Group B	P value
Highest sensory level achieved(range)	T_6-T_8	T_6-T_8	0.1713
Onset of sensory block(min) at L1	01.4± 00.45	01.50± 00.40	0.2466
Onset of sensory block (min) at T10	03.32 ± 01.17	03.59± 00.68	0.1703
Onset of sensory block(min) at highest sensory level	10.45± 01.91	10.99± 01.69	0.1364
Time to reach peak of sensory block(min) till L1	02.71± 00.84	02.9± 00.47	0.3591
Time to reach peak of sensory block(min) till T10	04.64±01.36	04.81±00.93	0.4555
Time to reach highest sensory level	14.69±01.36	16.26±0.72	0.1218
Time for 2 segment regression (min)	120.9±24.61	147.04±32.09	<0.0001
Time for complete regression (min)	264.8±38.87	325.76±38.49	<0.0001

Chi-square

Table 2: Showing Comparison of motor Characteristics of Subarachnoid Block Between two Groups

Variables	Group A	Group B	P value
Time to achieve grade I motor block (min)	03.72±00.78	03.75±00.88	0.8582
Time to achieve grade II motor block (min)	05.95±01.13	05.92±01.15	0.8964
Time to achieve grade III motor block(min)	10.91±01.85	10.88±01.72	0.9335
Regression of motor block to previous grade	147.18±24.94	161.38±24.05	<0.0001
Time to complete regression of motor block	194.72±22.57	213.44±22.27	<0.0001

Chi-square

Table 3: Showing Comparison of Sensory Characteristics of Subarachnoid Block Between two Groups.

Variables		Group A	Group B	P Value
Highest Sensory level achieved (Range)		T_6-T_8	T_6-T_8	0.1713
Onset of sensory block (min)	At L1dermatome	01.4+ 00.45	01.4+ 00.45	0.2466
	At T10dermatome	03.32+ 01.17	03.59+ 00.68	0.1703
	At highest sensory level	10.45+ 01.91	10.99+ 01.69	0.1364
Time to reach peak of sensory block (min)	At L1dermatome	02.71+ 00.84	02.9+ 00.47	0.3591
	At T10dermatome	04.64+ 01.36	04.81+ 00.93	0.4555
	Highest Sensory level	14.69+ 01.36	16.26+ 0.72	0.4555
Time for regression of sensory block (min)	2 Segment regression	120.9+ 24.61	147.04+ 32.09	<0.0001
	Complete regression	264.8+ 38.87	325.76+ 38.49	<0.0001

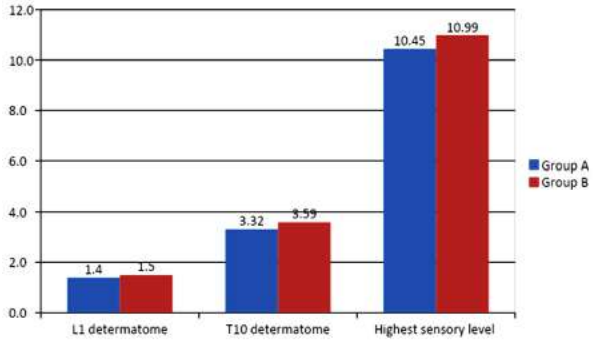
Values given in Mean + SD.

Inference

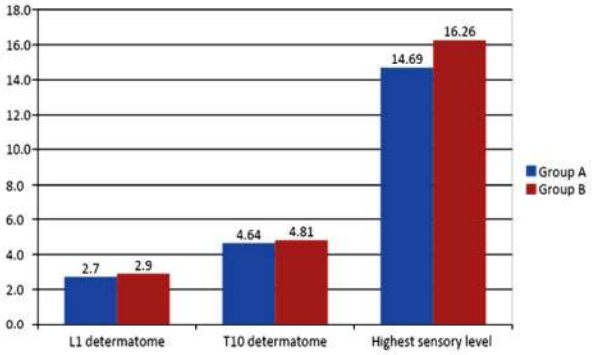
There was no statistically significant difference in mean time for onset, peak of sensory block in two groups. There was statistically significant difference in two segment and complete regression of sensory block. Regression of sensory block was prolonged in group b as compared to group A, (P<0.001).

Fig. 3: Showing Comparision of Sensory Characteristics of Subarachnoid Block Between Two Groups:

Bar diagram 3A: Onset of sensory blockade



Bar diagram 3B: Time to reach peak of sensory blockade



Bar diagram 3C: Time for regression of sensory blockade

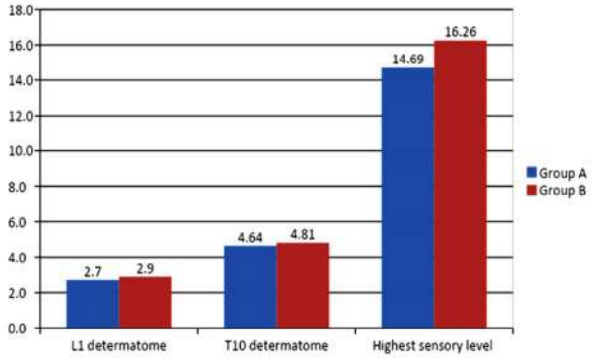
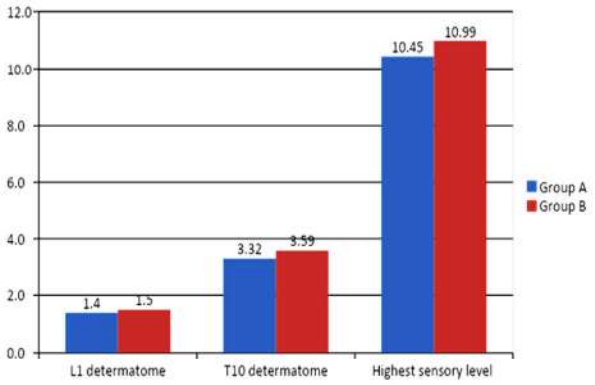


Table 4: Showing Comparison of Motor Characteristicsof Subarachnoid Block Between Two Groups

Variables	Group A (Mean+SD)	Group B (Mean + SD)	P Value
Time to acheive grade I motor block (min)	03.72 +00.78	03.75 +00.88	0.8582
Time to acheive grade II motor block (min)	05.95 +01.13	05.92 +01.15	0.8964
Time to acheive grade III motor block (min)	10.91 +01.85	10.88 +01.72	0.9335
Time to acheive grade IV motor block (min)	147.18 +24.94	161.38 +24.05	<0.0001
Time to complete regression of motor block	194.72 +22.57	213.44 +22.27	<0.0001

Fig.1: Showing Comparision of Sensory Characteristics of Subarachnoid Block between two Groups

Bar diagram: Onset of sensory blockade in two groups



Bar diagram: Regression of motor blockade in two groups

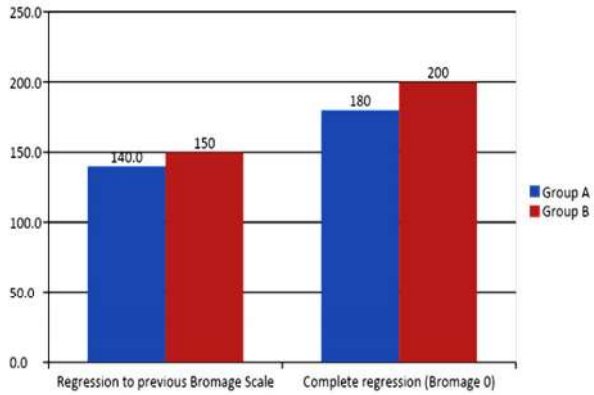


Fig. 2: Showing Statistical Analysis of Pulse Rate (Per/Min) Between Two Groups

Line diagram

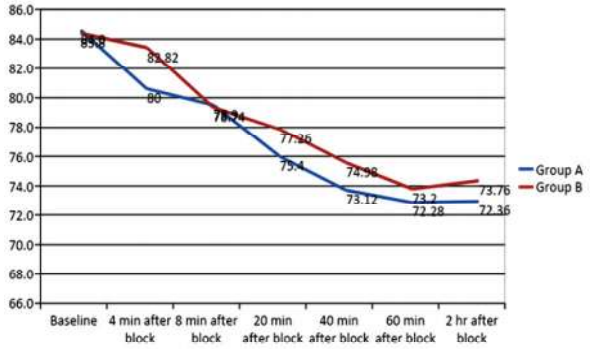


Fig. 4: Line diagram: Showing Statistical Analysis of SpO2 between two groups

Line Diagram: Changes in SpO2 between two groups.

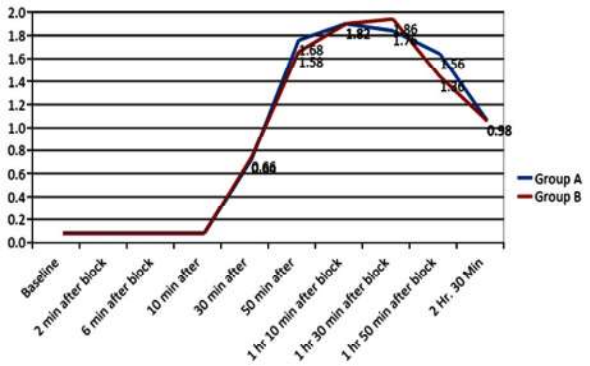


Fig. 5: Showing Distribution of Sedation Score Between Two Groups.

Line Diagram: Sedation score between two groups

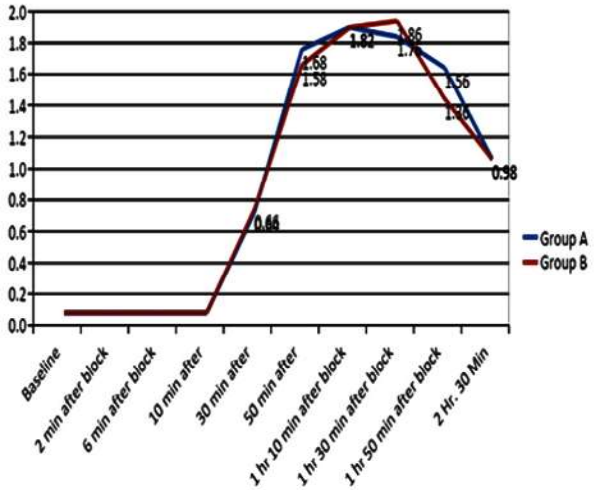


Fig. 6: Showing Statistical Analysis of Visual Analogue Scale Between Two Groups

Bar Diagram: Visual Analogue scale and time of first rescue analgesic required in two groups

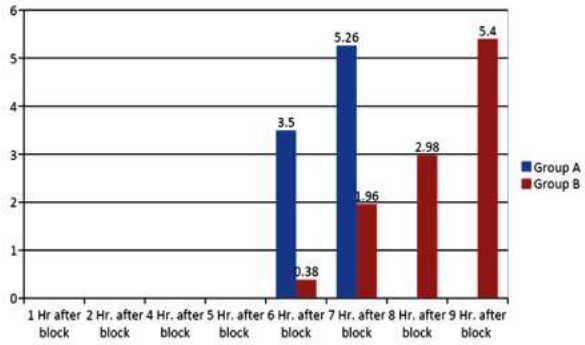


Table 3: Showing Complications in Two Groups

Complications	Group A No. of patients (%)	Group B No. of patients (%)
Hypotension	3 06%	3 06%
Bradycardia	3 06%	1 02%
Nausea-vomiting	4 08%	6 12%
Headache	0 00%	0 00%
Respiratory depression	0 00%	0 00%
Neurological complication	0 00%	0 00%

Discussion

Dexmedetomidine hydrochloride, a newer agent within the class of α2 adrenoceptor agonist, delivers clinically effective sedation within analgesic property for use in intensive care unit setting. Additionally, it has an ability to eliminate or reduce the need for other analgesic medications. There is no evidence of repiratory depression with dexmedetomidine. Because of its selective α2 receptor activity, use of dexmedetomidine has modest and predictable haemodynamic effects, making it a popular sedative and analgesic drug in ICU.[4,5,6]

Dexmedetomidine is now being used outside the ICU in variety of clinical settings, including sedation and adjunct analgesia in the operating room and for post operative analgesia.[4,5]

Though clonidine, an older member of α2 adrenoceptor family, has well established record of efficacy and safety as an adjuvant to local anesthetic in subarachnoid block,[9,15,16], dexmedetomidine

is yet to be established for this purpose. We decided to study the efficacy and safety profile of Dexmedetomidine versus clonidine in combination with local anaesthetic in subarachnoid block in pts. Of preeclampsia undergoing LSCS.

Present study showed that the supplementation of 10 mg of spinal Bupivacaine with 45 µg clonidine or 5µg dexmedetomidine did not show any significant difference in the time for onset and peak of sensory blockade. But addition of 5 µg dexmedetomidine showed significantly prolonged two segment regression and total duration of sensory blockade. Dexmedetomidine also showed longer postoperative analgesia period of 9 hours as compared to 7 hours in clonidine group. Findings of our study are similar to the findings reported by G.E Kanazi et al.[8] Rampalsingh et al[15] concluded that there was no singinficant difference in onset of sensory and motor block. Rampal Singh et al also concluded that total duration of sensory and motor block was prolonged with Dexmedetomidine as compared to clonidine. Solanki S L et al concluded that addition of dexmedtomidine to intrathecal Bupivacaine produces longer post operative analgesia than clonidine.

The mechanism by which intrathecal α2 adrenoceptor agonists prolonged the motor and sensory block is not well understood. It is not a result of altered systemic absorption, as the plasma level of Bupivacaine is not altered after the addition of intrathecal clonidine to Bupivacaine. It may be an additive or synergistic effect secondary to the different mechanism of action of local anesthetic and α2 receptor agonist.

The local anaesthetic acts by blocking the Na+ channels, whereas α2 receptor agonist acts by binding to presynaptic C fibers and post synaptic dorsal horn neurons. Intrathecal α2 adrenoceptor agonists produce analgesia by depressing the release of C fiber transmitters and by hyperpolarisation of post synaptic dorsal horn neurons.[6,7,13,14,18] These α2 adrenergic receptors are located on the superficial laminae of spinal cord and brain stem nuclei implicated in pain, so analgesia can be produced at peripheral, spinal and brain stem sites.[12] Intrathecal α2 receptor agonist have been found to have antinociceptive effect for both somatic and visceral pain.

α2 adrenergic agonists are known to cause bradycardia. Mechanism of bradycardia ia presynaptic feedback inhibition of norepinephrine release and possible vagomimetic effect on nucleus tractus solitaries by α2 agonist.[12] In the present study, 1 patient in the dexmedetomidine group and 3 patients in the clonidine group, presented with bradycardia.Use of low doses of Dexmedetomidine and clonidine in the present study may be responsible for low incidence of bradycardia.

In this study, addition of dexmedetomidine did not cause significant fall in the blood pressure intraoperatively and postoperatively. 3 patients in the dexmedetomidine group and 3 patients in the clonidine group developed hypotension which responded to intravenous fluid therapy and is statistically not significant. Intrathecal local anaesthetics block the sympathetic outflow and reduce the blood pressure. Sympathetic block is near maximum with the doses of local anaesthetic used for spinal anaesthesia. The addition of low dose of α2 agonist to high dose of local anaesthetics does not further affect the near maximal sympatholysis.[6]

Intrathecally administered α2 adrenoceptor agonists have a dose dependent sedative effect.[8, 10, 11, 16, 17] The dose of Dexmedetomidine and clonidine selected in this study did not produce excessive sedation, as at no time, sedation score exceeded two and no patient developed respiratory depression or fall in SPO2. In fact, the sedation produced by Dexmedetomidine and Clonidine was found to be desirable as all the patients remained calm and quite in intraoperative and postoperative period.

The only side effect noted was nausea and vomiting but it was not clinically and statistically significant and its incidence was comparable in both the groups.

Conclusion

Addition of 45µg of clonidine or 5µg Dexmedetomidine as an adjuvant to 0.5% hyperbaric bupivacaine in subarachnoid block provides comparable time for onset and peak of sensory and motor block but significantly prolonged, duration of motor blockade, duration of postoperative analgesia with Dexmedetomidine as compared to clonidine. Both the drugs as an adjuvant to bupivacaine in subarachnoid block produced effective and safe level of sedation the intraoperative and postoperative period extending upto 5 hours. Stable haemodynamics establishes the safety of both drugs in the doses used in presnt study. There was no steep fall in BP/HR. BP was maintained throughout surgery and postoperatively too.

In conclusion, Dexmedetomidine in the dose of 5µg added to 10 mg 0.5% Hyperbaric Bupivacaine in SAB for LSCS surgery in parturients with preeclampsia provides comparable onset for sensory

and motor blockade but significantly prolonged duration as compared to 45µg of clonidine.Longer duration of postoperative analgesia with 5µg Dexmedetomidine makes it superior to clonidine in respect to postoperative analgesia.Both the drugs produce desirable level of intraoperative and postoperative sedation, stable haemodynamics and minimal side effects.

References

1. Swain A, Nag DS, Sahu S, Samaddar DP. Adjuvants to local anesthetics: Current understanding and future trends. World journal of clinical cases. 2017 Aug 16;5(8):307.
2. Chaudhary S, Salhotra R. Subarachnoid block for caesarean section in severe preeclampsia. Journal of anaesthesiology, clinical pharmacology. 2011 Apr;27(2):169.
3. Bromage PR 1978, Philadelphia: WB Saunders.144.
4. Annals of pharmacology 2007; 41: 245-55.
5. Barash, Paul G; Cullen, Bruce F; Stoelting, Robert K; Cahalan, Michael K; Stock, M. Christine: Clinical Anaesthesia, 6th Edition; Chapter 37: Epidural and Spinal anaesthesia; p 925-945.
6. Eisanach JC, De Kock M, Klimscha. Alpha-2 adrenergic agonists for regional anaesthesia. Anaesthesiology 1996; 85: 655-74.
7. Fairbanke CA, Wilcox GL. Spinal antinociceptive synergism between morphine and clonidine persists in mice made acutely or chronically tolerant to morphine. J PharmacolExpTher 1999; 288: 1107-16.
8. G. E. Kanazi, M.T. Aouad, S.I.Jabbour-khoury, Al Jazzar, M.M. Alameddine, R. Al-Yaman. Effect of low-dose Dexmedetomidine or Clonidine on the characteristics of Bupivacaine spinal block. ActaAnaesthesiolScand 2006; 50: 222-227.
9. Dobrydnjov, K. Axelsson, J. Samarutel, B. Holmstrom. Postoperative pain relief following intrathecal Bupivacaine combined with intrathecal or oral Clonidine. ActaAnaesthesiologicaScandinav ica. 2002; 46: 7: 806-14.
10. IASP Sub-committee on Taxonomy. Pain terms: a list with definitions and notes on usage. Pain 1980; 8: 249-52.
11. Ibrahim F. A. Khallifa. A comparative study of adding intrathecalDexmedetomidine versus Sufentanil to heavy Bupivacaine for postoperative analgesia in patients undergoing inguinal hernia repair. Benha medical journal 2009; 26: 207-19.
12. J. G. Reves, Peter Glass, David A. Lubarsky, Matthew D. McEvoy, Ricardo Martinez-ruiz. Intravenous Anaesthetic; Ronald D. Miller's anaesthesia 7th edition: .719-69.
13. Law head RG, Blaxall HS, Bylund BD. Alpha-2 is the predominant a2 adrenergic receptor subtype in human spinal cord. Anaesthesiology 1992; 77: 983-91.
14. Mith MS, Schumbra UB, Wilson KH et al. a2 adrenergic receptor in human spinal cord: specific localized expression of mRNA encoding a2 adrenergic receptor subtypes at four distinct levels. Brain res 1995; 34: 109-17.
15. Rampal Singh and Aparna Shukla et al. Randomized, controlled study to compare the effect of intrathecal Clonidine and Dexmedetomidine on sensory analgesia and motor block of hyperbaric Bupivacaine. Indian journal of fundamental and applied life sciences. ISSN 2012 vol.2 (4) Oct-Dec, pg 24-33.
16. Robert D. Eric Evans, Laura A, Renee G. Spinal Clonidine prolongs labor analgesia from spinal Sufentanil and Bupivacaine. AnesthAnalg 1999; 88: 573-76.
17. Subhi M. Al-Ghanem, Islam M. massad, Mohamoud M. Al-Mustafa, Khaled R. Al-Zaben, Ibrahim Y Qudaisat, Ayman m Qatanweh. Effect of adding Dexmedetomidine versus Fentanyl to Intrathecal Bupivacaine on spinal block characteristics in gynecological procedures: A double blind controlled study. American journal of applied sciences 2009; 6: 882-87.
18. Yaksh TL, Jage J, Takano Y. Pharmacokinetics and pharmacodynamics of medullar agents. The spinal action of a2 adrenergic agonists as analgesics. Baillieres clinical anaesthesiology, 1993; 07: 597-616

Subscription Information

India
Institutional (1 year) (Print+Online): INR 8000

Rest of the World
Institutional (1 year) (Print+Online): $ 607

Payment instructions Online payment link:
http://rfppl.co.in/payment.php?mid=15

Cheque/DD:
Please send the US dollar check from outside India and INR check from India made payable to 'Red Flower Publication Private Limited'. Drawn on Delhi branch

Wire transfer/NEFT/RTGS:
Complete Bank Account No. 604320110000467
Beneficiary Name: Red Flower Publication Pvt. Ltd.
Bank & Branch Name: Bank of India, Mayur Vihar
MICR Code: 110013045
Branch Code: 6043
IFSC Code: BKID0006043 (used for RTGS and NEFT transactions)
Swift Code: BKIDINBBDOS

Send all Orders to: Subscription and Marketing Manager, **Red Flower Publication Pvt. Ltd.**, 48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi - 110 091(India)
Mobile: 8130750089, Phone: 91-11-79695648.
E-mail: info@rfppl.co.in, Website: www.rfppl.co.in

Indian Journal of Anesthesia And Analgesia

Library Recommendation Form

If you would like to recommend this journal to your library, simply complete the form given below and return it to us. Please type or print the information clearly. We will forward a sample copy to your library, along with this recommendation card.

Please send a sample copy to:

Name of Librarian

Name of Library

Address of Library

Recommended by:

Your Name/ Title

Department

Address

Dear Librarian,

I would like to recommend that your library subscribe to Indian Journal of Anesthesia And Analgesia. I believe the major future uses of the journal for your library would provide:

1. Useful information for members of my specialty.
2. An excellent research aid.
3. An invaluable student resource.

I have a personal subscription and understand and appreciate the value an institutional subscription would mean to our staff.

Should the journal you're reading right now be a part of your University or institution's library? To have a free sample sent to your librarian, simply fill out and mail this today!

Red Flower Publication Pvt. Ltd.
48/41-42, DSIDC, Pocket-II
Mayur Vihar Phase-I
Delhi - 110 091(India)
Phone: 91-11-79695648, Cell: +91-9821671871
E-mail: info@rfppl.co.in

Original Article

Indian Journal of Anesthesia and Analgesia
Volume 9 Number 3 May-June 2022
DOI: http://dx.doi.org/10.21088/ijaa.2349.8471.9322.10

Comparative Evaluation of Effect, Onset & Duration of Intranasal Dexmedetomidine Vs Midazolam for Paediatric Sedation During Diagnostic CT Scan

Somiya Gautam[1], Ashwin Sonkamble[2], Poornima Sonkamble[3], Usha Badole[4]

Author's Affiliation: [1]Senior Resident, [2,3]Associate Professor, [4]Professor and Head, Department of Anesthesia & Critical Care, Grant Government Medical College & Sir J J Group of Hospitals, Mumbai 400008, Maharashtra, India.

Abstract

Background: Separation anxiety among children is common and normal.Children undergoing radiological imaging studies often require sedation to avoid panic episodes & severe anxiety for induction of Anaesthesia. It is important for the child to lie still during the scanning procedure & mostly we find it difficult for the children to keep still during a CT scan, which is usually about 10–15 minutes.

This study aimed at comparing and evaluating the efficacy of use of intranasally administered Dexmedetomidine Vs intranasal midazolam for paediatric sedation undergoing diagnostic CT scan studies.

Methods: 100 paediatric patients within age group 1-10 years were divided into 2 groups of 50 patients each, Group I & II respectively, were given either intranasal Dexmedetomidine or Intranasal Midazolam. The depth of sedation was assessed by using University of Michigan sedation scale.

Results: This study concluded that Intranasal Dexmedetomidine is superior & more effective than Midazolam for pediatric sedation.

Keywords: Intranasal; Dexmedetomidine; Midazolam; Pediatrics; Children; Sedation; CT Scan.

Introduction

Mostly we find it difficult for the children to keep still during a CT scan study, which is usually about 10–15 minutes duration. Children undergoing radiological imaging studies often require sedation to avoid panic episodes & anxiety from parental separation. Therefore, it is important for the child to lie still during the scanning procedure for proper diagnostic studies for early definitive management.

To avoid spontaneous movements that can interfere during diagnostic studies, intranasal sedative medications can be useful in paediatric patients undergoing diagnostic CT Scan.

There are a number of methods which can be employed to limit the movement of the child during a scan.[1] Non-pharmacological[2] Sedation

How to cite this article:

Somiya Gautam, Ashwin Sonkamble, Poornima Sonkamble, et al./Comparative Evaluation of Effect, Onset & Duration of Intranasal Dexmedetomidine Vs Midazolam for Paediatrics Sedation During Diagnostic CT Scan/ Indian J Anesth Analg. 2022;9(3)119-123.

Corresponding Author: Ashwin Sonkamble, Associate Professor, Department of Anesthesia & Critical Care, Grant Government Medical College & Sir J.J. Group of Hospitals, Mumbai 400008, Maharashtra, India.
E-mail: seeashwin@rediffmail.com
Received on: 25.04.2022, **Accepted on:** 26.05.2022

and[3] General anaesthesia (GA).

Non-pharmacological interventions include behavioural and cognitive approaches such as desensitization, distraction and relaxation.

A pharmacological agent should have rapid onset and offset, predictable duration, minimal side effects and rapid recovery, easy availability and ability to decrease anaesthetic drug requirement.[11] In young children, particularly in those with behavioural difficulties, it can be difficult for them to keep still for the length of the time required. In these children, sedation and GA need to be considered.

Historically, chloral hydrate and pentobarbital have been the drug of choice for paediatric sedation in radiology departments. Because of their extended half-life, they have been associated with prolonged recovery times and sedation-related morbidity. In an effort to decrease our rate of failed sedations, reduce our recovery room time and improve our adverse event rate, other pharmacological agents had been introduced.[1]

There are many i.v. sedative agents available for pediatric imaging including Dexmedetomidine, Midazolam, Etomidate and Propofol. Amongst these, Midazolam and Dexmedetomidine are commonly used due to minimal side effects.

Therefore, the purpose of this study was to evaluate the preprocedural sedative effects, anxiety level changes and the ease of child-parent separation, and the recovery profile of preprocedure intranasal Dexmedetomidine sedation compared with that of intranasal Midazolam in children scheduled for diagnostic CT Scan.

Materials & Methods

After Institutional Ethics Committee (IEC) approval, a prospective, observational study was done in randomly 100 paediatric patients aged between 1 and 10 years of age, which were under American Society of Anesthesiologists (ASA) grade I and II undergoing diagnostic CT scan study. An informed written consent was taken from parents/ guardians of children prior to this study.

Children aged between 1-10 years, with ASA grade I & II undergoing elective minor procedures or radiological scans were included in this study. Children aged>10 years, with otorhinological diseases or respiratory or cardiac diseases, contraindicated for CT scan, known case of allergy to Dexmedetomidine or Midazolam, patients previously on any other sedatives, were excluded in this study.

All patients underwent pre-anaesthetic check-up (PAC) for detail history, examination and appropriate investigations including serum creatinine levels. All patients were kept Nil by Mouth (NBM) for 4-6 hours. On the day of procedure, NBM status and written consent was confirmed.

In both groups, intravenous (IV) line was secured using 22 or 24G cannula in either of the limbs.

Monitors viz, Electrocardiogram (ECG), Pulse-Oximeter were attached and the baseline values of heart rate (HR), oxygen saturation (Spo2), ECG & the state of alertness were observed before administering the drug followed by the time of administration, onset of action & duration of drug on the children were noted.

Group I received Intranasal Dexmedetomidine 2mcg/kg & Group II received Intranasal Midazolam 0.2mg/kg, then Oxygen was applied through the face mask at the flows of 4-5 L/min.

The vitals including HR, SP02, ECG & sedation score were recorded at the baseline, then after 5mins interval, then 10, 15 & 30 mins interval. Onset and degree of sedation in both groups was assessed at 0, 5, 10, 15 and 30 minutes.

The accurate monitoring for depth of sedation is very important. In our study, we have used University of Michigan Sedation Scale (UMSS) for sedation score.

University of Michigan Sedation Scale (UMSS)[12]
Score 0: *Awake and Alert*

Score 1: Minimally sedated Tired/sleepy, appropriate response to verbal conversation and/ or sound.

Score 2: Moderately sedated- Somnolent/sleeping, easily aroused with light tactile stimulation or a simple verbal command.

Score 3: Deeply sedated Deep sleep, arousable only with significant physical stimulation.

Score 4: Unarousable.

Afterwards, the paediatric patients were monitored for 30 mins postprocedural in post-anaesthesia recovery unit with oxygen administration via facemask.

Results

A total of 100 pediatric patients were included in our study. Both the groups were comparable with respect to baseline demographic variables like age, gender, height and weight.

Table 1: Comparison of Onset.

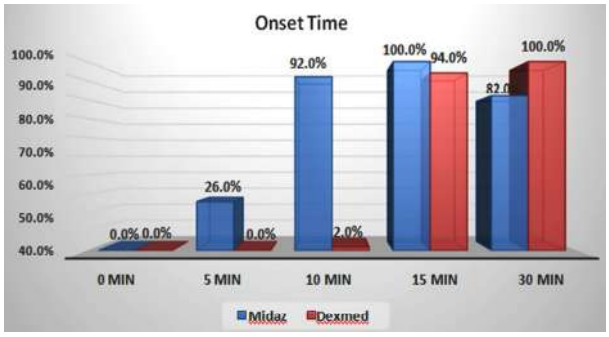
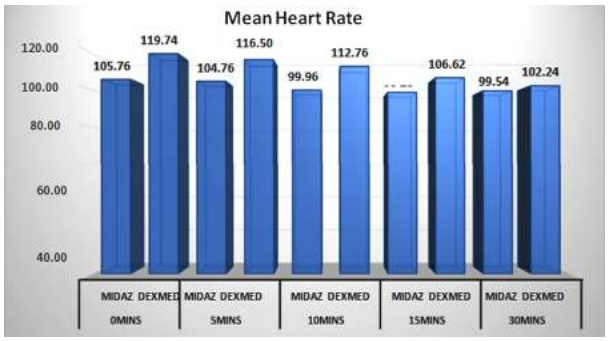
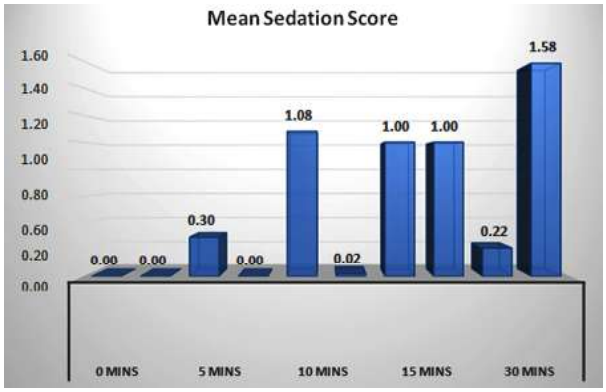


Table 2: Comparison of Heart Rate.



There was no significant difference between the groups.

Table 3: Comparison of Sedation Score.



Result: Overall, in the Dexmedetomidine group there was a higher incidence of satisfactory sedation at separation from parents than in the midazolam group, a reduced incidence of postprocedure agitation, and a significant reduction in the rescue doses of analgesic drugs in the Dexmedetomidine group.

Discussion

Children undergoing radiological imaging studies often require sedation to avoid panic episodes & severe anxiety. The risk factors which seem to be associated with high incidence of perioperative anxiety in children include: age 1 to 10 years, previous poor quality medical encounters, poor social adaptability and increased parental anxiety.[11] Maladaptive behavioural response such as general anxiety, night-time crying, enuresis, separation anxiety occur in up to 44% of children two weeks after procedure.[5]

Fear of physicians, injections, procedure and CT room in children is much more than in adults. Separation from the parents to a totally unknown world with unknown faces makes the procedural experience more traumatic for young children. Despite the many advances in non-pharmacologic interventions, practitioners still rely on sedative premedicants.[6] Therefore, sedation by pharmacological means is required. The ideal pharmacological agent should have rapid onset, predictable duration & rapid recovery.[5]

Dexmedetomidine provides conscious sedation, anxiolysis and analgesic effects without causing respiratory depression.[6] Midazolam, has become the most frequently used pre-anaesthesia medication given to children, by multiple routes of administration. It has a faster onset and limited duration of action when administered intranasally.[6,9]

Intranasal route is noninvasive, convenient, and easy, not requiring much of patient co-operation and fast onset of action.[9,5]

Compared with midazolam premedication, Dexmedetomidine premedication reduced the HR during the preprocedural sedation period after induction. Dexmedetomidine is known to decrease sympathetic outflow and circulating catecholamine levels and therefore would cause a decrease in HR.[9] There was no evidence of oxygen desaturation, respiratory depression, or apnea in our study, which was similar to the study done by Davis et al, on 88 children, which indicates that the doses used for both intranasal administered Midazolam and Dexmedetomidine are safe and comparable to the findings of other studies.[10]

Even, the use of Dexmedetomidine can provide additional analgesic benefits for pediatric patients following premedication and therefore, the patients treated with Dexmedetomidine required less postprocedural rescue analgesia as observed in one of the study.[6]

The Study included a total of 100 paediatric patients who were randomly divided into one of the following two groups (50 each) using random numbers: Group A–receiving intranasal

Dexmedetomidine 2ug/kg and; Group B–receiving intranasal Midazolam 0.2mg/kg. Onset and degree of sedation in both group was assessed at 0, 5, 10, 15 and 30 minutes. Whether parental separation at the time of induction was successful was recorded. Both the groups were comparable with respect to baseline demographic variables like age, gender and BMI. By the end of 5 and 10 minutes, sedation was achieved in 26% and 92% of the cases of Midazolam group as compared to 0% and 2% of the cases in Dexmedetomidine group. By the end of 15 minutes, the difference was non-significant 83 (100% vs 94%; p-0.24). At the end of 15 minutes, sedation was achieved in 100% and 94% of the cases in Midazolam & Dexmedetomidine group respectively.

In the present study, successful parental separation was seen in 80% cases of Dexmedetomidine group as compared to 48% cases in Midazolam group respectively. Therefore, Dexmedetomidine premedication of paediatric patients resulted in more satisfactory separation from parents compared with midazolam.

Limitations & Drawbacks

We accept the fact that there are some major drawbacks in our study. First of all the sample size is very small to have a significant power of analysis. Secondarily, we have studied only the patients in 1-10 years of age group scheduled for diagnostic CT Scan study. The differences in age may have influenced some of the results because the pharmacokinetics and pharmacodynamics between younger and older children vary. Third, significant heterogeneity was observed in some of the analyses (separation from parents, HR and sedation score preprocedural); therefore, the results should be assessed with caution. Finally, although considerable clinical data have been reported, Dexmedetomidine is not approved for use in children in many country. Thus, its use in children is considered cautious in its administration to at-risk patients is warranted.

Conclusion

This study compares two intranasal drugs i.e, Dexmedetomidine and Midazolam in achieving adequate sedation in paediatric population undergoing diagnostic CT Scan and concluded that the Dexmedetomidine is superior to Midazolam premedication because it resulted in excellent separation from parents and reduced post-procedure agitation & pain. Midazolam though has early onset but shorter duration of action and may require post-procedural rescue analgesia, while Dexmedetomidine has relatively late onset but longer duration of action & post-procedural analgesia & is more effective compared to Midazolam.

References

1. Mason KP, Zgleszewski SE, Dearden JL, Dumont RS, Pirich MA, Stark CD, D'Angelo P, Macpherson S, Fontaine PJ, Connor L, Zurakowski D. Dexmedetomidine for pediatric sedation for computed tomography imaging studies. AnesthAnalg. 2006 Jul;103(1):57-62.
2. Jun JH, Kim KN, Kim JY, Song SM: The effects of intranasal dexmedetomidine premedication in children:a systematic review and meta-analysis;2017Sep;64(9):947-961.doi:10.1007/s12630-017-0917-x.Epub 2017 Jun21.
3. Akin A, Bayram A, Esmaoglu A, Tosun Z, Aksu R, Altuntas R, Boyaci A: Dexmedetomidinevs midazolam for premedication of pediatric patients undergoing anesthesia; PaediatricAnaesth. 2012 Sep;22(9):871-6. doi: 10.1111/j.1460-9592.2012.03802.x. Epub 2012 Jan23
4. Pasin L, Febres D, Testa V, Frati E, Borghi G, LandoniG, Zangrillo A: Dexmedetomidinevs midazolam as preanesthetic medication in children: a meta- analysis of randomized controlled trials;PaediatrAnaesth. 2015 May;25(5):468-76. doi: 10.1111/pan.12587. Epub 2015Jan 6.
5. Dr.Pradipta Bhakta, Dr. B. R. Ghosh, Dr. Manjushree Roy, Dr.Gouri Mukherjee. Evaluation of intranasal midazolam for preanasthetic sedation in paediatric patients. Indian J. Anaesth.2007;51(2):111-116.
6. Peng K, Wu SR, Ji FH, Li J. Premedication with dexmedetomidine in pediatric patients: a systematic review and meta-analysis. Clinics. 2014;69(11):777-786.
7. Talon MD, Woodson LC, Sherwood ER, Aarsland A, McRae L, Benham T. Intranasal dexmedetomidine premedication is comparable with midazolam in Burn children undergoing reconstructive surgery. J Burn Care Res. 2009;30:599–605.
8. Sheta SA, Al-Sarheed MA, Abdelhalim AA. Intranasal dexmedetomidinevs midazolam for premedication in children undergoing complete dental rehabilitation: A double-blinded randomized controlled trial. Paediatric Anaesth 2014;24:181-9.
9. Malineni N, Patil MC. "Comparative evaluation of intranasal dexmedetomidine and intranasal midazolam for premedication in children undergoing anaesthesia": A 1-year double-blind randomized controlled trial. Indian J Health Sci Biomed Res 2017;10:155-9.
10. Davis PJ, Tome JA, McGowan FX Jr., Cohen IT, Latta K, Felder H. Preanesthetic medication with intranasal midazolam for brief pediatric surgical

procedures. Effect on recovery and hospital discharge times. Anesthesiology 1995;82:2-5.

11. Dr. ShwetaNitturi, Dr. OlvynaD'souza. A Comparative Evaluation of Intranasal Dexmedetomidine and Intranasal Midazolam for Premedication in Pediatric Surgery. IAIM, 2018; 5(1): 82-94.
12. Malviya S, Voepel-Lewis T, Tait AR, Merkel S, Tremper K, Naughton N. Depth of sedation in children undergoing computed tomography: validity and reliability of the University of Michigan Sedation Scale (UMSS).Br J Anaesth. 2002 Feb;88(2):241-5.

Case Report

Indian Journal of Anesthesia and Analgesia
Volume 9 Number 3 May-June 2022
DOI: http://dx.doi.org/10.21088/ijaa.2349.8471.9322.11

COVID 19 Patients with Pregnancy Anesthetic Management Case Series

Mathew George[1], Ravi Madhusudhana[2], Naga Seshu Kumari Vasantha[3], Kiran Nelamangala[4]

Author's Affiliation: [1]Postgraduate Student, [2]Professor & HOD, [3]Assistant Professor, [4]Professor, Department of Anesthesia, Sri Devaraj Urs Medical College, SDUAHER, Kolar 563101, Karnataka, India.

Abstract

Introduction: Case series helps us to evaluate management and safety of spinal anesthesia for caesarean delivery in pregnant women with COVID-19 infection.

Case Series: We hereby report the management of three COVID-19 positive pregnant women undergoing caesarean section in our hospital. Patients presented with mild symptoms of COVID 19. Routine investigations and COVID -19 markers were evaluated. Anesthesia and operation went uneventfully.

Conclusion: Health care providers and babies were not infected with virus. Precautionary measures and strategies were of utmost importance to lower virus contagion risk. Spinal anesthesia was preferred over GA.

Keywords: Caesarean section, COVID-19, Pregnant, Spinal Anesthesia.

Key Messages: When confronted with caesarean section in parturient with COVID-19, careful planning and detailed preparation improved the safety of the mother and infant and reduced the risk of infection for medical staff.

Introduction

COVID 19 infection caused by corona virus is extremely contagious and can cause severe acute respiratory tract infection. COVID-19 infection can spread to other pregnant women and health care workers. Hence management of such patients is of utmost importance.[1]

Pregnant women with mild infection may present with fever, fatigue, dry cough, but severe infection may progress rapidly to acute respiratory distress syndrome, septic shock, intractable acidosis and coagulopathy.[2]

How to cite this article:

Mathew George, Ravi Madhusudhana, Naga Seshu Kumari Vasantha, et al./COVID 19 Patients with Pregnancy Anesthetic Management Case Series/Indian J Anesth Analg. 2022;9(3):125-127.

Corresponding Author: Ravi Madhusudhana, Professor & HOD, Department of Anesthesia, Sri Devaraj Urs Medical College, SDUAHER, Kolar 563101, Karnataka, India.
E-mail: ravijaggu@gmail.com
Received on: 14.04.2022, **Accepted on:** 03.05.2022

During caesarean section generation of infectious agents such as blood, amniotic fluid, creates a challenge for healthcare workers in keeping the mother and neonate safe, while protecting themselves against infection.[3]

We hereby report the management of three COVID-19 positive pregnant women undergoing caesarean section in our hospital.

Case Series

Case 1: A 21 year old patient, primigravida 39 weeks gestation age was referred to RLJH, in view of being tested positive for COVID-19. Patient was asymptomatic at the time of presentation. Patient had a primary contact with her brother who was tested positive for COVID-19. Patient was not vaccinated for COVID-19. LSCS was done. Baby was tested on using RT PCR and was negative. Patient sp 02 was 93% on room air. Fig. 1 shows her chest x-ray with mild opacities.

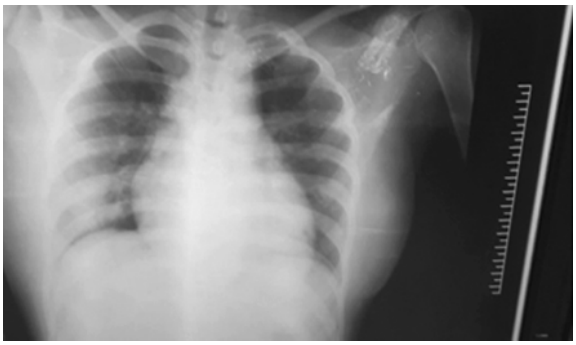


Fig. 1: Case 1 CXR with mild opacities.

Case 2: A 19 year old patient, primigravida with 39 weeks gestation age with COVID-19 positive status was referred to RLJH, after she had tested positive for COVID-19. None of her family members were tested positive for COVID 19. Patient had mild fever at the time of presentation. Patient was not vaccinated for COVID-19. LSCS was done. Baby was tested using RT PCR and was negative. Patient spo 2 was 89% at room air. Fig. 2 shows her chest x ray with moderate opacities.

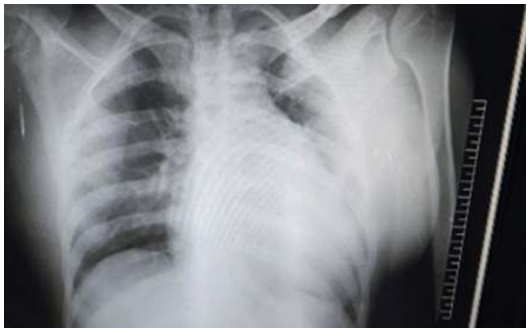


Fig. 2: Case 2nd CXR with moderate opacities.

Case 3: A 21 year old patient, primigravida with 40 weeks gestation age with cephalic presentation with COVID-19 positive status was referred to RLJH, after she had tested positive for COVID-19. None of her family members were tested positive for COVID 19. Patient had mild fever and sore throat at the time of presentation. Patient was not vaccinated for COVID-19. LSCS was done. Baby was tested using RT PCR and was negative. Patient spo 2 was 90 at room air. Fig. 3 shows chest x ray of this patient.

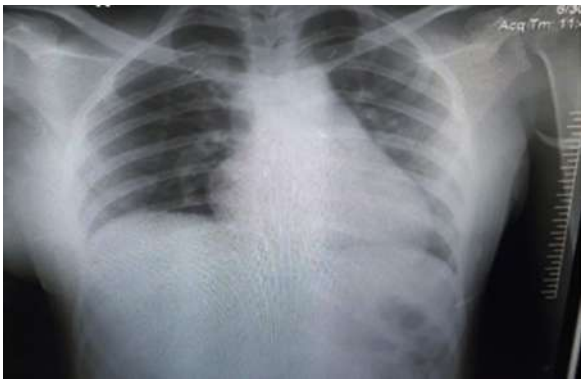


Fig. 3: Case 3rd CXR.

Anesthetic Management

Patient was shifted to designated COVID-19 OT with a surgical triple layer mask covering the face. Anesthesiologist wearing Level 3 PPE assessed the patient and his reports just outside operating room then explained regarding spinal anesthesia. Anesthesiologist after checking routine and covid related investigations (Table 1) started case. It was the duty of helper to spray the sodium hypochlorite solution (1%) on the footprints of the trolley.

Table 1: Investigations of 3 cases.

Findings	Case 1	Case 2	Case 3	Normal Range
Neutrophils	75%	77%	78%	<45
Lymphocytes	16.50%	17%	14.80%	20 to 40%
N/L	4.54	4.52	5.27	.78 to 3.53
D dimer	1101.2 ng/ml	810.2ng/ml	1204.83 ng/ml	<250ng/ml
Ferritin	43.1 ng/ml	55.4 ng/ml	16.5 ng/ml	20 to 250mg / ml
LDH	278 u/l	235u/l	245 u/l	110 to 210 u/L
CRP	Negative	Negative	Positive	Negative

Abbreviations: N/L neutrophils/lymphocytes, LDH lactate dehydrogenase, CRP–C reactive protein.

Electrocardiogram, blood pressure, saturation and vitals were monitored keenly. Anesthesiologist after assessing the patient changed his outer gloves with the help of operating room circulating nurse, thereby maintaining proper hand hygiene. The patient was made to sit at the side of the table with help of anesthesia technicians. As per standard aseptic precautions concerned site was painted with betadine and spirit. Local anesthesia was then given (2mL of 2% lignocaine). At the level of L4–L5 a 25-gauge spinal needle was inserted, and 2 mL of heavy bupivacaine 0.5% was given after confirming free backflow of CSF. Patient then made to lie in supine position. Vitals were monitored. Spinal anesthesia was tested, and it was found adequate. The obstetrician went ahead with caesarean section. During the course of procedure patient vitals including blood pressure was noted to be stable. There was no need to give mephenteramine. After delivery of the baby, sample of the amniotic fluid was taken, and the baby was handed over to the neonatologist, who performed the polymerase chain reaction COVID-19 swab. Before exiting the operation theatre, the anesthesia team removed their PPE kits according to hospital protocol.

Discussion

In our hospital, we had a COVID-19 OT complex, in accordance with the standards laid by the perioperative recommendation issued during this pandemic. Along with providing the best clinical care for the COVID-19 pregnant patient, the exposure of SARS COV-2 to HCWs and the new-born were reduced by taking necessary IPC measures.[4]

Therefore, we used Level 3 PPE in OT, and shifted the new born to the separate room immediately as a part of our effective IPC measures. Level 3 PPE included splash resistant whole-body suit, face shield, N-95 mask, cap, goggles, shoe covers and 2 pairs of gloves. However, the patient was wearing surgical triple layer mask during transport as an IPC measure according to our hospital policy.[5]

Pregnant women with positive COVID-19 tests were managed based on the severity of illness. COVID-19 infection by itself was not an absolute indication to perform CS. Patients could be delivered according to individual obstetric indications. Patients should be tested for COVID-19 if they become symptomatic. Evaluation of the maternal and foetal status were performed in order to balance the risks and benefits of delaying the delivery until the result of the test comes back. The clinical manifestation of COVID-19 and gestational age were the prime factors in determining the appropriate time for delivery.[6]

We preferred spinal anesthesia instead of general and epidural anesthesia. Regional anesthesia should be preferred over general anesthesia to prevent undue exposure of health care workers to aerosol generating procedure. It had reduced rates of respiratory depression. There was no vertical transmission seen in our study.

Conclusion

Precautionary measures and strategies were of utmost importance and should be opted so as to lower virus contagion risk. Spinal anesthesia was preferred over GA

Acknowledgement: Nil

Conflict of Interest: Nil

References

1. Chhabra A, Rao TN, Kumar M, Singh Y, Subramaniam R. Anesthetic management of a COVID-19 parturient for caesarean section - Case report and lessons learnt. Indian J Anesth. 2020;2:S141-S143.
2. Huang C, Wang Y, Li X. Clinical features of patients infected with 2019 novel coronavirus in Wuhan. China Lancet. 2020;395:497–506.
3. Jeong SY, Sung SI, Sung JH. MERS-CoV infection in a pregnant woman in Korea. J Korean Med Sci. 2017;32:1717–20.
4. Jain K, Alen J, Kumar S, Mitra S. Protocolized approach to a COVID-19 parturient undergoing a cesarean section - A case report. J Anesthesiol Clin Pharmacol. 2020;36:407-410
5. Liew MF, Siow WT, Yau YW, See KC. Safe patient transport for COVID-19. Critical Care. 2020 Dec;24(1):1-3.
6. Bani Hani DA, Alsharaydeh I, Bataineh AM, Al Athamneh M, Qamileh Iet al. Successful Anesthetic Management in Cesarean Section for Pregnant Woman with COVID-19. Am J Case Rep. 2020;

SUBSCRIPTION FORM

I want to renew/subscribe international class journal "**Indian Journal of Anesthesia and Analgesia**" of Red Flower Publication Pvt. Ltd.

Subscription Rates:
- Institutional: **INR 8000 / USD 625**

Name and complete address (in capitals):_____
_____

Payment detail:
Online payment link: http://rfppl.co.in/payment.php?mid=15

Cheque/DD: Please send the US dollar check from outside India and INR check from India made payable to 'Red Flower Publication Private Limited'. Drawn on Delhi branch.

Wire transfer/NEFT/RTGS:
Complete Bank Account No. 604320110000467
Beneficiary Name: Red Flower Publication Pvt. Ltd.
Bank & Branch Name: Bank of India; Mayur Vihar
MICR Code: 110013045
Branch Code: 6043
IFSC Code: BKID0006043 (used for RTGS and NEFT transactions)
Swift Code: BKIDINBBDOS

Term and condition for supply of journals
1. Advance payment required by Demand Draft payable to **Red Flower Publication Pvt. Ltd**. payable at **Delhi.**
2. Cancellation not allowed except for duplicate payment.
3. Agents allowed 12.5% discount.
4. Claim must be made within six months from issue date.

Mail all orders to
Subscription and Marketing Manager
Red Flower Publication Pvt. Ltd.
48/41-42, DSIDC, Pocket-II
Mayur Vihar Phase-I
Delhi - 110 091(India)
Phone: 91-11-79695648, Cell: +91-9821671871
E-mail: info@rfppl.co.in

Case Report

Indian Journal of Anesthesia and Analgesia
Volume 9 Number 3 May-June 2022
DOI: http://dx.doi.org/10.21088/ijaa.2349.8471.9322.12

Anaesthetic Management of Patient with Hypertrophy Obstructive Cardiomyopathy Posted for Elective Caesarean

Pooja Arunkumar Giriyapur[1], Ravi Madhusudhana[2], Sumanth Tarigonda[3], Sravanthi Nagasai Ganagavarapu[4]

Author's Affiliation: [1]Postgraduate Student, [2]Professor & HOD, [3]Assistant Professor, [4]Senior Resident, Department of Anesthesiology, Sri Devaraj Urs Medical College, SDUAHER, Kolar 563101, Karnataka, India.

Abstract

Introduction: Dynamic valvular insufficiency and LVOT blockage are also possible outcomes of hypertrophic obstructive cardiomyopathy (HOCM). Furthermore, attempting to replace an inadequate mitral valve surgically can result in iatrogenic LVOT blockage.

In the general population, it affects one out of every 500 adults, with a male to female ratio of 2:1. Among the general population, the prevalence is around 0.2 percent, and the incidence in pregnant women is around 0.1–0.5 percent.

Case Report: 21 year old female patient presented with 9 months of amenorrhea posted for elective lower segment caesarean section. Her previous documents revealed that she was a diagnosed case of hypertrophic obstructive cardiomyopathy during her last pregnancy 1 year ago. History of previous surgery that is induced abortion at two and half months of gestation age a year back operated under spinal anaesthesia. ECG showed ST elevation present in V2 , V3, V4 , V5 leads and features of left ventricular hypertrophy (LVH) , Her echocardiography report revealed features of hypertrophic obstructive cardiomyopathy with severe LVOT obstruction. Left ventricular ejection fraction (LVEF) was 20-25%.

Conclusion: HOCM is normally well tolerated during pregnancy, although those who have had previous symptoms or arrhythmias may experience an exacerbation of symptoms. The majority of these people, on the other hand, can be effectively controlled medically. This case report showed that patients with HOCM can be safely managed under general anaesthesia with muscle relaxants and inhalational volatile anaesthetics, as well as an erector spinae block for analgesia.

Keywords: Erector spinae block, Esmolol, HOCM, Heart disease, Inhalational anaesthetics, Pregnancy.

Key Messages: Pregnant Patients coming for caesarean section having cardiomyopathy may go unnoticed prior to anaesthetizing for surgery. During the operative and post-operative period, they may present with unexplained hypotension and hemodynamic collapse which may require acute management with Vasopressors. We are presenting a case report of HOCM and its successful management.

How to cite this article:

Pooja Arunkumar Giriyapur, Ravi Madhusudhana, Sumanth Tarigonda, et al./Anaesthetic Management of Patient with Hypertrophy Obstructive Cardiomyopathy Posted for Elective Caesarean/Indian J Anesth Analg. 2022;9(3):131-134.

Corresponding Author: Ravi Madhusudhana, Professor & HOD, Department of Anaesthesia, Sri Devaraj Urs Medical College, SDUAHER, Kolar 563101, Karnataka, India.
E-mail: ravijaggu@gmail.com
Received on: 12.04.2022, **Accepted on:** 03.05.2022

Introduction

Hypertrophic obstructive cardiomyopathy (HOCM) can be a familial disease transmitted with autosomal dominant inheritance. Mutation in genes that code for cardiac sarcomere proteins can cause hypertrophy of segments of the ventricle. Septal involvement may be common, Incidence is 1 in every 500 adults, and in pregnant females is approximately 0.1-0.5%.[1]

It can include massive hypertrophy primarily involving the ventricular septum. Majority of the patients may be asymptomatic throughout life, some may present with severe limiting symptoms of dyspnoea, angina, syncope and a few may even die suddenly because of ventricular arrhythmias.

Case Report

A 21 year old female patient, weighing 40 kg presented with 9 months of amenorrhea posted for elective lower segment caesarean section. Her previous documents revealed that she was having hypertrophic obstructive cardiomyopathy during her last pregnancy 1 year ago. History of previous surgery that is induced abortion at two and half months of gestation age a year back operated under spinal anaesthesia. Presently asymptomatic, was on tablet Metoprolol 25 mg.

Examination revealed pallor, pulse rate of 92/min and blood pressure of 96/60 mm Hg, respiratory rate of 18cpm and was afebrile. Systemic examination of cardiovascular S1 S2 heard, murmur heard over all the chest fields, respiratory, central nervous system was normal with per abdomen examination of gravid uterus. On airway examination include class 3 of Mallampati.

Laboratory investigations were complete blood count Hemoglobin: 11 g%, RBC: 4.54 million/mm 3, PCV: 34.40% , WBC: 9.99 T/cmm, Platelet count : 323 T/mm3, BT- 2 minute oo sec. CT-5 minute 50 sec, INR-1.24, PT: 15.4, APTT-32, ECG showed ST elevation present in V2, V3, V4 , V5 leads and features of left ventricular hypertrophy (LVH) (Fig. 1), Her echocardiography report revealed features of hypertrophic obstructive cardiomyopathy with severe LVOT obstruction. Ejection fraction (LVEF) was 20-25%.

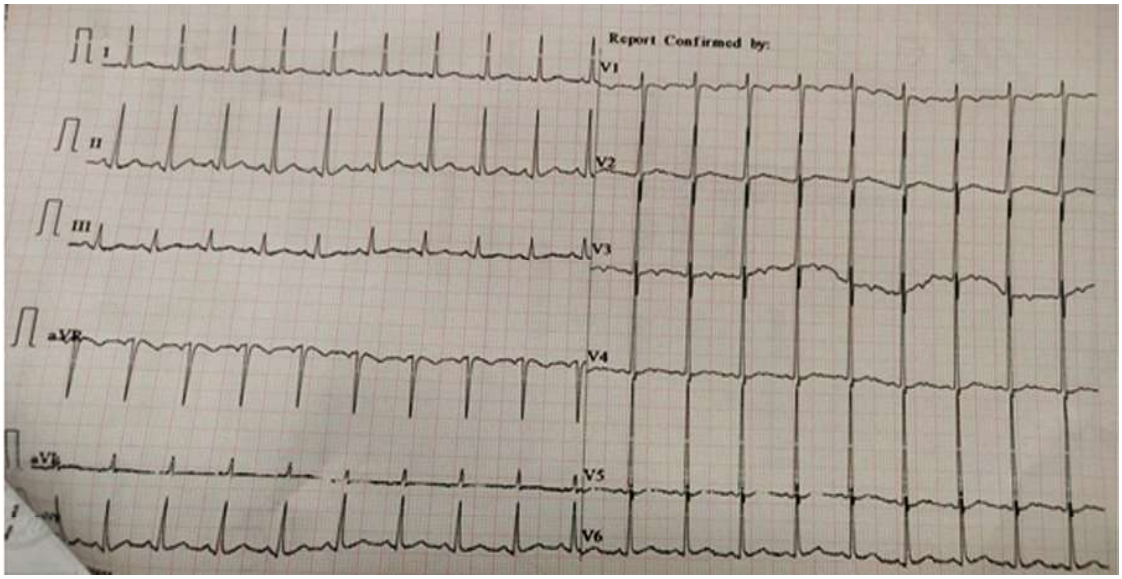


Fig. 1: ECG shows ST elevation present in V2 , V3, V4 , V5 leads and features of left ventricular hypertrophy(LVH)

Anesthetic Management

General anaesthesia and Erector spinae block was planned for the surgery. 18G IVC secured in right hand. Monitoring includes pulse oximetry, ECG, invasive blood pressure, end-tidal carbondioxide. Patient was Pre medicated with IV, Inj. Midazolam 2 mg, IV Esmolol 20mg, IV Loxicard 60mg and Inj. Fentanyl 80 mcg IV. Preoxygenation done with 100% oxygen for 3 min. Induced with Inj. Thiopentone 125mg IV. After elimination of reflexes and reaching enough depth of anaesthesia appropriate endotracheal tube of size 6.5mm ID was inserted and fixed at 20cm, cuff inflated with air, bilateral air entry confirmed and good lung ventilation was confirmed by chest rise and ETCO2, and tube was fixed in place. Anaesthesia was maintained with 50% nitrous oxide in oxygen, with intermittent positive pressure ventilation. Muscle relaxant-IV Atracurium 15 mg given. Analgesia IV Paracetamol

1g given and erector spinae block given. Procedure lasted for 40 minutes, reversal IV Neostigmine 2.5mg plus IV Glycopyrrolate 0.4mg given. Patient extubated after thorough oral suctioning, vitals stable, shifted to ICU for observation.

Discussion

The pathophysiology of hypertrophic obstructive cardiomyopathy includes "dynamic" LVOT blockage, which varies depending on the amount of blood in the ventricle just before ventricular systole.[1] Mitral regurgitation, diastolic dysfunction, and dysrhythmias are induced by dynamic blockage caused by systolic anterior motion of the anterior mitral valve leaflet.[1] The increased volume over load of pregnancy induces enlargement of the ventricle, which might theoretically lessen LVOT blockage; nevertheless, the increased cardiac output counteracts this effect, and the LVOT gradient increases as the pregnancy progresses.[1] The risk of atrial fibrillation increases with the same volume loading because the left atrium becomes distended. Volume changes and an elevated heart rate are not well tolerated in the context of diastolic illness, increasing dyspnoea symptoms and reducing the threshold for developing left heart failure. Due to a decrease in systemic vascular resistance and the potential of decreased venous return due to compression, pregnancy worsens the illness even more. Women with HOCM, on the other hand, usually tolerate pregnancy well. Women who are unwell prior to pregnancy and who have substantial LVOT blockage are at a higher risk. Anxiety, stress, and labor pain all raise the heart rate and contractility.[1]

We planned to give general anaesthesia to our patient. She was on tab. Metoprolol. Metoprolol lowers heart rate, improving ventricular filling, and lowering myocardial oxygen demand; however, beta blockers can cause fetal acidosis.[1] It also attenuates the intubation's hemodynamic response. Fentanyl was given because they reduce sympathetic activity, also providing analgesia. It is okay to use intravenous induction drugs such as thiopental to induce anaesthesia, although a fast drop in systemic vascular resistance should be avoided.[1]

Isoflurane, for maintenance, was used in our case as it is cardio stable.[1] We chose atracurium because it is cardio stable. Beta agonistic drugs including dopamine, ephedrine, and dobutamine should be avoided since they enhance myocardial contractility and heart rate, which can lead to LVOT blockage.[1]

Because hypotension and tachycardia are known side effects of oxytocin, it is safest to administer it slowly and continuously.[1] Pulmonary edema has been found in patients following delivery, necessitating careful fluid management.[1] Severe hypertrophic cardiomyopathy can be followed using transthoracic echocardiography to guide fluid and vasopressor management during an elective caesarean section.[1]

In one case report, parturient was taken for emergency caesarean section, epidural anaesthesia was chosen. Epidural anaesthesia is safe for such patients, provided adequate volume expansion is done. Epidural anaesthesia is tolerated well without any complications even in pregnant females with HOCM having significant LVOT gradient. They chose 0.75% Ropivacaine over 0.5% Bupivacaine due to its superior sensory blockade, better cardiovascular profile as compared to Bupivacaine.[2]

Vaginal delivery is the most common method, with caesarean delivery reserved for obstetric reasons. In low risk, asymptomatic HCM patients, epidural anaesthesia is rarely required. Due to the risk of vasodilation and hypotension, epidural and spinal anaesthesia should be used with caution in women with significant LVOT blockage, and single-shot spinal anaesthetic should be avoided.[3]

Few elements, such as sympathetic stimulation from laryngoscopy and intubation, incision, surgical stress, and blood loss, are unavoidable during anaesthesia and surgery. Inadequate monitoring can exacerbate the blockage of the dynamic outflow tract. As a result, the goal of treatment in these patients is to reduce LVOT blockage. Due to arrhythmia, dynamic LVOT blockage, and diastolic dysfunction, these patients may worsen perioperatively. As a result, preventive measures include aggressive sinus rhythm maintenance with defibrillation or pharmacological therapy, prevention or treatment of LVOT obstruction by maintaining preload and afterload with phenylephrine, and beta blocker or verapamil administration, as well as suppression of sympathetic stimulation.[4]

Conclusion

HOCM is normally well tolerated during pregnancy, although those who have had previous symptoms or arrhythmias may experience an exacerbation of symptoms. The majority of these people, on the other hand, can be effectively controlled medically. This case report showed that patients with HOCM can be safely managed under general anaesthesia with muscle relaxants and inhalational volatile

anaesthetics, as well as an erector spinae block for analgesia.

Conflict of Interest: Nil

References

1. Bhalerao PM, Adsule PB, Marathe RM: Anaesthetic management of a patient with hypertrophic obstructive cardiomyopathy posted for emergency lower segment caesarean section. J Obstet Anaesth Crit Care.
2. Bhure AR, Marodkar KS: Successful anaesthetic management of a case of hypertrophic obstructive cardiomyopathy posted for elective caesarean section using epidural anaesthesia with 0.75% Ropivacaine. J Obstet Anaesth Crit Care. 2011, 1:38-40.
3. Pieper PG, Walker F: Pregnancy in women with hypertrophic cardiomyopathy. Neth Heart J. 2013, 21:14-18.
4. Sahoo RK, Dash SK, Raut PS, Badole UR, Upasani CB: Perioperative anesthetic management of patients with hypertrophic cardiomyopathy for noncardiac surgery: A case series. Ann Card Anaesth. 2010, 13:253-6.

Subscription Information

India
Institutional (1 year) (Print+Online): INR 8000

Rest of the World
Institutional (1 year) (Print+Online): $ 607

Payment instructions Online payment link:
http://rfppl.co.in/payment.php?mid=15

Cheque/DD:
Please send the US dollar check from outside India and INR check from India made payable to 'Red Flower Publication Private Limited'. Drawn on Delhi branch

Wire transfer/NEFT/RTGS:
Complete Bank Account No. 604320110000467
Beneficiary Name: Red Flower Publication Pvt. Ltd.
Bank & Branch Name: Bank of India, Mayur Vihar
MICR Code: 110013045
Branch Code: 6043
IFSC Code: BKID0006043 (used for RTGS and NEFT transactions)
Swift Code: BKIDINBBDOS

Send all Orders to: Subscription and Marketing Manager, **Red Flower Publication Pvt. Ltd.**, 48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi - 110 091(India)
Mobile: 8130750089, Phone: 91-11-79695648.
E-mail: info@rfppl.co.in, Website: www.rfppl.co.in

Case Report

Indian Journal of Anesthesia and Analgesia
Volume 9 Number 3 May-June 2022
DOI: http://dx.doi.org/10.21088/ijaa.2349.8471.9322.13

Erector Spinae Block for thoracic Trauma

Rahul Kurra[1], Ravi Madhusudhana[2], Sumanth T[3]

Author's Affiliation: [1]Postgraduate Student, [2]Professor & HOD, [3]Assistant Professor, Department of Anesthesiology, Sri Devaraj Urs Medical College, SDUAHER, Kolar 563101, Karnataka, India.

Abstract

Introduction: Anesthesiologists face a difficult task in managing pain in trauma patients with acute rib and spine fractures, and attaining appropriate analgesia is critical in minimizing pulmonary consequences. Erector spinae plane (ESP) blocks are a type of localized anaesthetic that can be used to treat pain.

Case Report: After falling off his bike, a 42-year-old man suffered several rib and spine fractures. His injuries included fractures of the D4, D5, D8, D11, and D12 vertebral bodies, as well as fractures of the pedicle and spinous process of the D7 and D9 vertebrae, as well as comminuted fractures of the D7 and D10 vertebral bodies.

The decision to proceed with bilateral ESP block was made. A right-sided ESP block was conducted.

On presentation, the patient was in excruciating pain due to multiple rib and spine fractures, and was experiencing pain-related decreased respiratory effort. After receiving an ESP block, the patient's pain gradually subsided, and his respiratory effort improved, and he was managed conservatively in the hospital until he was taken for surgical intervention.

Conclusion: A novel myofascial plane block for thoracic analgesia is the ultrasound-guided erector spinae plane block (ESP). It allows patients to cough and breathe deeply while also reducing the length of time they are on mechanical ventilation.

Keywords: Erector Spinae block; Thoracic trauma.

Key Messages: Provide appropriate messages of about 35-50 words to be printed in centre box.

A 42 year old male patient sustained multiple rib and spine fractures. Pain management in such patients is a challenge for the anesthesiologist.ESP block is a novel myofascial plane block for thoracic analgesia and provides an alternative regional anesthetic technique for pain management. Ultrasound guided bilateral ESP block was given after which patient was pain free and successful management of the case is reported.

How to cite this article:

Rahul Kurra, Ravi Madhusudhana, Sumanth T/Erector Spinae Block for thoracic Trauma/Indian J Anesth Analg. 2022;9(3):137-139.

Corresponding Author: Ravi Madhusudhana, Professor & HOD, Department of Anaesthesia, Sri Devaraj Urs Medical College, SDUAHER, Kolar 563101, Karnataka, India.
E-mail: ravijaggu@gmail.com
Received on: 12.04.2022, **Accepted on:** 03.05.2022

Introduction

Anesthesiologists face a difficult task in managing pain in trauma patients with acute rib and spine fractures, and attaining appropriate analgesia is critical in minimizing pulmonary consequences. Erector spinae plane (ESP) blocks are a type of localized anaesthetic that can be used to treat pain. In regional anaesthesia, the ESP block is a basic fascial plane block with a growing application. Although early investigations of the ESP block showed that local anaesthetic diffused over the thoracolumbar fascia and into the paravertebral region, providing analgesia to both the dorsal and ventral rami of the spinal roots, more research is needed. The ESP block is expected to provide excellent analgesia for individuals with acute traumatic spine fractures or patients undergoing surgical spinal instrumentation by blocking the dorsal rami. A case of effective analgesia with bilateral ESP block for a patient with acute traumatic rib fracture and T4 vertebral body rupture fracture is described in this study.

Case Report

After falling off his bike, a 42 year old man suffered several rib and spine fractures. His injuries included fractures of the D4, D5, D8, D11, and D12 vertebral bodies, as well as fractures of the pedicle and spinous process of the D7 and D9 vertebrae, as well as comminuted fractures of the D7 and D10 vertebral bodies (Fig. 1), which resulted in spinal canal narrowing, cord compression, and spinal cord oedema. The patient described extreme pain in his thorax and back due to the severity of his injuries.

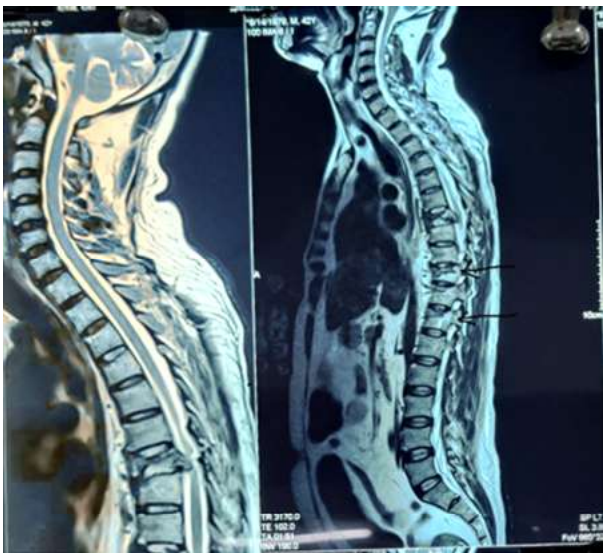


Fig. 1: It shows fractures in multiple levels.

Noninvasive blood pressure, heart rate, pulse oximetry (SpO2), and electrocardiogram (ECG) monitoring become routine. In light of respiratory distress, the patient was placed on HFNC (high flow nasal cannula) with a fio2 of 60% and a flow rate of 40 litres. His SpO2 was 80 percent on face mask 5 L/min, and ECG readings revealed normal sinus tachycardia. The chest pads were connected after two big intravenous accesses were inserted.

The patient was originally treated with a multimodal analgesic regimen that included planned acetaminophen (1000 mg four times a day), Diclofenac (75 mg twice a day), Tramadol (50 mg twice a day), and a Buprenorphine transdermal patch. An epidural was not recommended due to his severe spine fractures. Pain, on the other hand, remained uncontrollably high. Due to splinting from pain, the patient required a high flow nasal cannula (HFNC) and intermittent continuous positive airway pressure (CPAP) to improve breathing function.

On post injury day 2, the surgical team contemplated placing an epidural, but it was deemed hazardous due to the significant risk of surgical site bleeding and the potential for epidural hematoma formation. As a result, the decision to proceed with bilateral ESP block was made. A right sided ESP block was conducted under ultrasound guidance with a high frequency linear ultrasound probe after informed permission. With the transducer positioned in a parasagittal orientation roughly 3 cm off midline, the right T4 transverse process was found. Using an in-plane needling method, a 17 gauge Tuohy needle was advanced in a cephalad to caudad direction to a point exactly posterior to the T4 transverse process and anterior to the erector spinae muscle. The ESP was discovered.

On presentation, the patient was in excruciating pain due to multiple rib and spine fractures, and was experiencing pain related decreased respiratory effort. After receiving an ESP block, the patient's pain gradually subsided, and his respiratory effort improved, and he was managed conservatively in the hospital until he was taken for surgical intervention (spinal fusion and implant fixation).

Discussion

The block's use has expanded to cover the treatment of a variety of acute and chronic pain conditions in the thorax and abdomen.[1-4] The ESP block has previously been documented in the acute trauma patient with spine fractures as an alternative to neuraxial procedures.[2,7] However, the ESP block has not been described in the acute trauma patient with spine fractures as an alternative to neuraxial

techniques.

The analgesic advantage for patients having spine surgery or with acute traumatic spine fractures can be explained by the projected cephalad and caudad spread along the thoracolumbar fascia, which encompasses the dorsal rami of the spinal nerves. The injectate distribution into the intercostal gaps, where local anaesthetic can act on the ventral rami, appears to provide an additional mechanism of action for analgesia of the anterolateral thoracic and abdominal wall.[6] There is one case series that illustrates the successful use of ESP blocks in patients undergoing spine surgery, however this was in the absence of further trauma-related injuries, and the ESP blocks were placed at low thoracic levels near the surgical site.[5]

The ESP block, like other fascial plane blocks, is technically simple to perform and is thought to have a lower risk of consequences such as nerve damage, pneumothorax, and hematoma formation.[2,3] The ESP block also allows for ongoing neurologic testing in trauma patients with intracranial disease or possible spinal cord injury, which can be muddled when neuraxial procedures are performed.

Furthermore, when compared to neuraxial procedures, there are less contraindications to installation, making ESP blocks a viable alternative to neuraxial or even paravertebral approaches. Expanding the use of the ESP block for patients having spine surgery or with acute traumatic spine fractures could provide an analgesic option for people who were previously unsuitable for the procedure. This opens up the possibility of a new line of investigation and research.

Conclusion

Rib and spine fractures are typical injuries in acute chest trauma, causing intense thoracic pain and limiting patients' capacity to cough and breathe deeply, leading to atelectasis and pneumonia. Analgesics and localised anaesthesia have been described as therapies for pain control in rib and spine fractures. A novel myofascial plane block for thoracic analgesia is the ultrasound guided erector spinae plane block (ESP). It allows patients to cough and breathe deeply while also reducing the length of time they are on mechanical ventilation.

Conflict of Interest: Nil

References

1. M. Forero, S. D. Adhikary, H. Lopez, C. Tsui, and K. J. Chin,"The erector spinae plane block a novel analgesic techniquein thoracic neuropathic pain," Reg Anesth Pain Med 2016;41: 621–627.
2. D. L. Hamilton and B. Manickam, "Erector spinae plane block for pain relief in ribfractures," Br. J. Anaesth,2017; 118 ; 474-475.
3. M. Forero, M. Rajarathinam, S. Adhikary, and K. J. Chin,"Erectorspinae plane (ESP) blockin the management of post thoracotomy pain syndrome: a case series," Scand. J. Pain2017;17: 325–329.
4. K. J. Chin, L. Malhas, and A. Perlas, "The erector spinaeplane block provides visceral abdominal analgesia in bariatric surgery: a report of 3 cases," RegAnesth Pain Med, 2017; 42:372–376,2017.
5. J. P. Melvin, R. J. Schrot, G. M. Chu, and K. J. Chin, "Lowthoracic erector spinae plane block for perioperative analgesiain lumbosacral spine surgery: a case series," Can J Anaesth, 2018 ; 65:1057–1065.
6. S. D. Adhikary, S. Bernard, H. Lopez, and K. J. Chin, "Erector spinae plane block versusretrolaminar block: a magnetic resonance imaging and anatomical study," RegAnesth Pain Med2018; 43: 756–762.
7. Adhikary SD, Liu WM, Fuller E, Cruz Eng H, Chin KJ. The effect of erector spinae plane block on respiratory and analgesic outcomes in multiple rib fractures: a retrospective cohort study. Anaesthesia. 2019 ;74:585-93.

Case Report

Indian Journal of Anesthesia and Analgesia
Volume 9 Number 3 May-June 2022
DOI: http://dx.doi.org/10.21088/ijaa.2349.8471.9322.14

Pregnancy and Antiphospholipid Antibody Syndrome

Aswin B[1], Sumanth T[2], Ravi Madhusudhana[3]

Author's Affiliation: [1]Postgraduate Student, [2]Assistant Professor, [3]Professor & HOD, Department of Anesthesiology, Sri Devaraj Urs Medical College, SDUAHER, Kolar 563101, Karnataka, India.

Abstract

Introduction: ALPA is an autoimmune hypercoagulable state caused by antiphospholipid antibodies. It is characterized by thrombotic episodes in arteries, veins and pregnancy related complications like still birth, preterm delivery, miscarriage and severe preeclampsia. We report a case of APLA syndrome due to its rarity.

Case Report: A 28 year old woman with a history of two previous abortions and positive serology for APLAs with 9 months gestation came to our hospital for safe confinement. She was diagnosed as primary APLA syndrome in view of bad obstetric history and positive lupus anticoagulant. She is a known hypothyroidism.

She was on Injection Enoxaparin 0.6 ml OD for 1 year which was changed to unfractionated heparin 14000 units OD subcutaneously after admitting to our hospital. In view of bad obstetric history, an elective caesarean section was planned. Unfractionated heparin was stopped 24 hours before surgery. Preoperative investigations revealed a normal APTT, PT, INR.

Spinal anesthesia given in L3–L4 inter-spinal space with 25G needle after preloading with 500 ml crystalloids and a sensory block up to T6 was attained. She delivered a single live male child with APGAR score 9. Injection Oxytocin 15 units was given intraoperatively. The further perioperative course was uneventful. She was restarted on Injection Enoxaparin 0.6ml OD for 6 weeks.

Conclusion: A successful outcome in a patient with APLA syndrome requires a multidisciplinary approach to prevent both thrombotic and hemorrhagic complications. However, routine screening of pregnant women is not necessary because of it is low incidence.

Keywords: Pregnancy; APLA.

Key Messages: Provide appropriate messages of about 35-50 words to be printed in centre box.

ALPA is an autoimmune disorder with symptoms ranging from recurrent abortions, thromboembolic events, thrombocytopenia. Antithrombotic therapy is a mainstay of treatment given in these patients as the risk of recurrent thromboembolism is high. Intraoperative thromboembolic events in such patients is a challenge for the anaesthesiologist.

How to cite this article:

Aswin B, Sumanth T, Ravi Madhusudhana/Pregnancy and Antiphospholipid Antibody Syndrome/Indian J Anesth Analg. 2022;9(3):141-143.

Corresponding Author: Sumanth T, Assistant Professor, Department of Anaesthesia, Sri Devaraj Urs Medical College, SDUAHER, Kolar 563101, Karnataka, India.
E-mail: tom2f4u@gmail.com
Received on: 12.04.2022, **Accepted on:** 03.05.2022

Introduction

ALPA is an autoimmune hypercoagulable state caused by antiphospholipid antibodies. It is characterized by thrombotic episodes in arteries, veins and pregnancy related complications like still birth, preterm delivery, miscarriage and severe preeclampsia. We report a case of APLA syndrome due to its rarity.

Case Report

A 28 year old woman with a history of two previous abortions and positive serology for APLAs with 9 months gestation came to our hospital for safe confinement. She was diagnosed as primary APLA syndrome in view of bad obstetric history and positive lupus anticoagulant. She had history of hypothyroidism with no history of other auto-immune disorders.

She was on Injection Enoxaparin 0.6 ml OD for 1 year which was changed to unfractionated heparin 14000 units OD subcutaneously after admitting to our hospital. In view of bad obstetric history, an elective caesarean section was planned. Unfractionated heparin was stopped 24 hours before surgery. Preoperative investigations revealed a normal APTT, PT, INR

Subarachnoid block was given in L3–L4 inter spinal space with 25G quincke spinal needle. Sensory blockade till T6 was achieved along with motor blockade. She delivered a single live male child with APGAR score 9. Intraoperatively Injection Ondensetron, Injection Oxytocin 15 units and 3 pints of crystalloids was given intravenously. The further perioperative course was uneventful. She was restarted on Injection Enoxaparin 0.6ml OD for 6 weeks.

Discussion

The diagnosis of the antiphospholipid syndrome is based on the occurrence of clinical features and positive serology for APLAs. Antiphospholipid antibodies include anticardiolipin antibodies (aCL) and lupus anticoagulant antibodies (LA). The combination of either anticardiolipin or lupus anticoagulant antibodies with one and more of the characteristic clinical features like thrombosis or recurrent pregnancy loss is termed Antiphospholipid syndrome. Recurrent thromboembolic events, recurrent abortions, valvular lesions, thrombocytopenia and hemolytic anemia.[1,2] The incidence is more in woman's than males (female: male 4.5:1). The prevalence of APLA in the general population is only 2% while it is 30% in women with systemic lupus or thrombosis. It can be primary in the absence of any underlying illness or secondary when associated with other auto-immune disorders 2 Despite their name, lupus anticoagulant antibodies are associated with thromboembolic events rather than clinical bleeding episodes. Pathogenesis of this syndrome is poorly understood, many mechanisms have been described, one being binding of APLAs to endothelial cells, which stimulates an up regulation of the adhesion molecules and an increase leukocyte adhesion leading to a prothrombic state.[4,5] Most recently a catastrophic antiphospholipid variant with a mortality rate of approximately 50% has been described.[6] The mechanism of fetal loss is placental thrombosis leading to placental failure. Platelets may be damaged directly by phospholipid antibody or indirectly by beta 2 glycoprotein 1 which causes platelet aggregation. The damaged platelets adhere to the exposed basement membrane of the endothelium and syncytiotrophoblast resulting in thrombus formation.

In patients with a history of miscarriage, future outcomes of the pregnancy are improved when a combination of aspirin and heparin are used.[6,7] This therapy is withheld at the time of surgery to decrease blood loss and started immediately after delivery and continued for 6 weeks postpartum.

Antiphospholipid antibody can be precipitated perioperatively (thrombotic storm) by surgical intervention, infection or a change in anticoagulation therapy.[6] Intraoperatively anti embolic stockings, intermittent venous compression devices and adequate hydration can decrease the incidence of such complications. The optimal analgesic administration is imperative to facilitate early mobilization, which in turn decreases the incidence of thrombotic events postoperatively. Vigilant monitoring for both bleeding and thromboembolic episodes is required during the perioperative period.

Conclusion

A successful outcome in a patient with APLA syndrome requires a multidisciplinary approach to prevent both thrombotic and hemorrhagic complications. However, routine screening of pregnant women is not necessary because of it is low incidence.

Conflict of Interest: Nil

References

1. Shapiro SS, Thiagarajan P. Lupus anticoagulants. Prog Hemost Thromb. 1982;6:263–85.
2. Dhir V, Pinto B. Antiphospholipid syndrome: A review. J Mahatma Gandhi Inst Med Sci. 2014;19:19–27.
3. Patel D, Khade AR, Bansal S, Goswami S. Anaesthetic implications in a case of antiphospholipid antibody syndrome for elective caesarean section. Gujarat Med J. 2014;69:122–3.
4. Pierangeli SS, Colden-Stanfield M, Liu X, Barker JH, Anderson GL, Harris EN. Antiphospholipid antibodies from antiphospholipid syndrome patients activate endothelial cells in vitro and in vivo. Circulation. 1999;99:1997–2002
5. Luma HN, Doualla MS, Temfack E, Bagnaka SA, Mankaa EW, Fofung D. The antiphospholipid antibody syndrome: A case report. Int Med Case Rep J. 2012;5:63–7.
6. Garg P, Saxena KN, Taneja B. Anaesthetic implications of antiphospholipid antibody syndrome in pregnancy. J Obstet Anaesth Crit Care. 2011;1:35–7.
7. Empson M, Lassere M, Craig J, Scott J. Prevention of recurrent miscarriage for women with antiphospholipid antibody or lupus anticoagulant. Cochrane Database Syst Rev. 2005 Apr;18 CD002859.

Instructions to Authors

Submission to the journal must comply with the Guidelines for Authors. Non-compliant submission will be returned to the author for correction.

To access the online submission system and for the most up-to-date version of the Guide for Authors please visit:

http://www.rfppl.co.in

Technical problems or general questions on publishing with **IJAA** are supported by Red Flower Publication Pvt. Ltd.'s Author Support team (http://rfppl.co.in/article_submission_system.php?mid=5#)

Alternatively, please contact the Journal's Editorial Office for further assistance.

Editorial Manager
Red Flower Publication Pvt. Ltd.
48/41-42, DSIDC, Pocket-II
Mayur Vihar Phase-I
Delhi - 110 091(India).
Mobile: 9821671871, Phone: 91-11-79695648
E-mail: author@rfppl.co.in

Case Report

Indian Journal of Anesthesia and Analgesia
Volume 9 Number 3 May-June 2022
DOI: http://dx.doi.org/10.21088/ijaa.2349.8471.9322.15

A Case Report of Pseudocholinesterase Fergse Deficiency

Kaushika Premchand

Author's Affiliation: Junior Resident, Department of Internal Medicine, NLC India, City Neyveli T.S 607801, Tamil Nadu, India.

Abstract

Introduction: The drug metabolising enzyme pseudocholinesterase (butyrylcholinesterase) is responsible for the breakdown of the muscle relaxant medicines mivacurium and succinylcholine. Following infusion of mivacurium and succinylcholine, a deficiency of any kind might produce protracted paralysis and apnoea.

Case presentation: It's a case study of a patient who developed long-term apnea after taking mivacurium.

Conclusion: Prolonged blocks may be encountered due to mivacurium use. The diagnosis of pseudocholinesterase enzyme deficiency can be given after a careful clinic supervision and peripheral nerve stimulator monitoring. A decrease in the activity of pseudocholinesterase enzyme and improvement in neuromuscular function will help verifying our diagnosis. Instead of pharmacological applications that may further complicate the situation, what should be done in such patients is to wait until the block-effect goes down by the help of sedation and mechanical ventilation.

Keywords: Metabolising; Patient; Prolonged blocks; Block-effect.

Introduction

Pseudocholinesterase (PChE) is an enzyme with a complex molecular structure.[1] It is synthesized in the liver and immediately released into the plasma.[2] The plasma half-life has been estimated to be approximately 12 days.[3] Deficiency or reduced activity of this enzyme results in significant prolongation of mivacurium or succinylcholine induced neuromuscular blockade.[4] In addition, PCh E activity may be reduced by a number of disease states or by concomitant drug administration. Mivacurium, which is a nondepolarizing neuromuscular blocking drug administered in doses of 0.1 to 0.2 mg/kg, also produces rapid onset

How to cite this article:

Kaushika Premchand/A Case Report of Pseudocholinesterase Fergse Deficiency/Indian J Anesth Analg. 2022;9(3):145-147.

Corresponding Author: Kaushika Premchand, Junior Resident, Department of Internal Medicine, NLC India, City Neyveli T.S 607801, Tamil Nadu, India.
E-mail: drkaushika0804@gmail.com
Received on: 10.12.2021, **Accepted on:** 05.01.2022

of neuromuscular blockade lasting 15 to 30 minutes.[5] The rapid ester hydrolysis of mivacurium by PChE results in the short duration of action of this drug, which is ideal for providing muscle relaxation for brief surgical procedures.[6] But, the duration of mivacurium in adults is inversely related to serum PChE activity.[7] In this case report, a patient who developed mivacurium apnea postoperatively due to congenital or acquired pseudocholinesterase enzyme deficiencies is discussed.

Pseudocholinesterase deficiency can be caused by mutations in the BCHE gene. This gene provides instructions for making the pseudocholinesterase enzyme, also known as butyrylcholinesterase, which is produced by the liver and circulates in the blood. The pseudocholinesterase enzyme is involved in the breakdown of choline ester drugs. It is likely that the enzyme has other functions in the body, but these functions are not well understood.

Studies suggest that the enzyme may be involved in the transmission of nerve signals.

Some BCHE gene mutations that cause pseudocholinesterase deficiency result in an abnormal pseudocholinesterase enzyme that does not function properly. Other mutations prevent the production of the pseudocholinesterase enzyme. A lack of functional pseudocholinesterase enzyme impairs the body's ability to break down choline ester drugs efficiently, leading to abnormally prolonged drug effects.

When due to genetic causes, this condition is inherited in an autosomal recessive pattern, which means both copies of the gene in each cell have mutations. Most often, the parents of an individual with an autosomal recessive disorder have one copy of the altered gene in each cell and are called carriers. They can pass on the gene mutation to their children, but they do not usually experience signs and symptoms of the disorder. In some cases, carriers of BCHE gene mutations take longer than usual to clear choline ester drugs from the body, but not as long as those with two copies of the altered gene in each cell.

Case presentation

A 31-year-old woman, weighing 78 kg, was scheduled for caesarean section under general anesthesia. She was not operated previously. Induction of anesthesia was achieved with 130 mg of propofol. Muscular relaxation was achieved before intubation with 12 mg of mivacurium. Isoflurane was used as the general anesthetic inhalation agent. The operation lasted for 30 minutes and the sectio-surgery was uneventful. After the surgery, the inhalation agent was discontinued and the patient received 100% oxygen. It was noted that emergence seemed to be prolonged after 10 minutes. All vital signs were stable, showing no signs of tachycardia or hypertension. Oxygen saturation remained 100%. After an additional 10 minutes, there was suspicion of a PChE deficiency. Peripheral nerve stimulator (PNS) produced zero twitches. Three milligrams of midazolam was administered intravenously for its sedation and amnestic effects. Later the patient was transferred to the post-anesthesia Care Unit (PACU) for observation and ventilator support. Sixty-two minutes later, spontaneous muscle twitching was noted. One hour and twenty-two minutes later from the initial use of mivacurium, the patient had regained sufficient motor function to meet extubation requirements. Blood samples were drawn and sent to confirm a PChE deficiency [Paitent's PChE value (normal range) 1017 IU/L (2000 to 11000 IU/L)]. The patient was transferred to a hospital ward for the evening and discharged two days later. The PChE values of the patient who was called for a control after two months was considered between the normal ranges (3124 IU/L).

Discussion

Mivacurium is a potent benzylisoquinoline, nondepolarizing neuromuscular blocking drug. A recommended intravenous dose of 0.15 to 0.2 mg/kg provides tracheal intubating conditions within 2 to 2.5 minutes, with a predicted duration of action of 15 to 25 minutes, making it an ideal drug for short procedures requiring tracheal intubation.[8] İt is a structural relative of atracurium, but it does not undergo Hofmann elimination and is rapidly hydrolysed by PChE.

Its duration of action is affected by the activity of this enzyme. PChE is a tetrameric glycoprotein enzyme produced by the liver that hydrolyzes choline esters, such as those found in succinylcholine, mivacurium, procaine, chloroprocaine, tetracaine, cocaine and heroine.[9]

In patients with a normal genotype for PChE, mivacurium's duration of action is inversely related to PChE activity and duration of action is slightly prolonged if activity is low.[10]

Reduced PChE activity may occur as a result of inherited causes related to mutations at a single autosomal location on the long arm of chromosome 3.[11] When there is a deficiency of this enzyme due to the presence of one or more atypical alleles, the mivacurium is not properly metabolized

and thus, muscle paralysis can last for several hours. There are two forms of inherited atypical pseudocholinesterase deficiency. The heterozygous atypical form affects anywhere from 1 in 25, to 1 in 480 individuals (depending on the severity of the condition).[9]

Patients heterozygous for an abnormal enzyme may show up to 50% prolongation of block.[12] The homozygous atypical form affecting approximately 1 in 3200 to 5000 individuals.[9]

In patients homozygous for an abnormal enzyme duration may be significantly prolonged, and even a small dose, (eg.0.03 mg/kg) can result in complete paralysis for up to 128 minutes.[13]

References

1. Lockridge O, Bartels CF, Vaughan TA, Wong CK, Norton SE, Johnson LJ: Complete amino acid sequence of human serum cholinesterase. J Biol Chem 1987, 262:549-557.
2. Pedersen NA, Jensen FS: Clinical importance of plasma cholinesterase for the anaesthetist. Ann Acad Med Singapore 1994, 23(Suppl):120-124.
3. Ostergaard D, Viby-Mogensen J, Hanel HK, Skovgaard LT: Halflife of plasma cholinesterase. Acta Anaesthesiol Scand 1988, 32:266-269.
4. Cerf C, Mesguish M, Gabriel I, Amselem S, Duvaldestin P: Screening patients with prolonged neuromuscular blockade after succinylcholine and mivacurium. Anesth Analg 2002, 94:461-466.
5. Ali HH, Savarese JJ, Embree PB, Basta SJ, Stout RG, Bottros LH, Weakly JN: Clinical pharmacology of mivacurium chloride (BW B1090U) infusion: comparison with vecuronium and atracurium. Br J Anaesth 1988, 61:541-546.
6. Savarese JJ, Lien CA, Belmont MR, Wastila WB: The clinical pharmacology of new benzylisoquinoline-diester compounds with special consideration of cisatracurium and mivacurium. Anesthetist 1997, 46:840-849.
7. Goudsouzian NG, d'Hollander AA, Viby-Mogensen J: Prolonged neuromuscular block from mivacurium in two patients with cholinesterase deficiency. Anesth Analg 1993, 77:183-185.
8. Frampton JE, McTavish D: Mivacurium. A review of its pharmacology and therapeutic potential in general anaesthesia. Drugs 1993, 45:1066-1089.
9. Pantuck E: Plasma cholinesterase: gene and variations. Anesth Analg 1993, 77:380-386.
10. Ostergaard D, Jensen FS, Jensen E, Skovgaard LT, Viby-Mogensen J: Influence of plasma cholinesterase activity on recovery from mivacurium-induced neuromuscular blockade in phenotypically normal patients. Acta Anaesthesiol Scand 1992, 36:702-706.
11. Allderdice PW, Gardner HA, Galutira D, Lockridge O, La Du BN, McAlpine PJ: The cloned butyrylcholinesterase (BCHE) gene maps to a single chromosome site, 3q26. Genomics 1991, 11:452-454.
12. Ostergaard D, Jensen FS, Jensen E, Viby-Mogensen J: Mivacurium induced neuromuscular blockade (NMB) in patients heterozygous for the atypical gene for plasma cholinesterase (Abstract). Anesthesiology 1989, 71(Supp 3A):A782.
13. Ostergaard D, Jensen FS, Jensen E, Skovgaard LT, Viby-Mogensen J: Mivacurium-induced neuromuscular blockade in patients with atypical plasma cholinesterase. Acta Anaesthesiol Scand 1993, 37:314-318.
14. Davis L, Britten JJ, Morgan M: Cholinesterase. Its significance in anaesthetic practice. Anaesthesia 1997, 52:244-260.
15. Kumari R, Rao YN, Talukdar B, Agarwal S, Puri RK: Serum enzyme abnormalities in protein energy malnutrition. Ind Pediatr 1993, 30:469-473.
16. Novacek G, Vogelsang H, Schmidt B, Lochs H: Are single measurements of pseudocholinesterase and albumin markers for inflammatory activity or nutritional status in Crohn's disease? Wien Klin Wochenschr 1993, 105:111-115.
17. Umeki S: Biochemical abnormalities of the serum in anorexia nervosa. J Nerv Ment Dis 1993, 176:503-506.
18. Musle function and neuromuscular blockade. In Textbook of Anesthesia 4th edition. Edited by: Aitkenhead AR, Rowbotham DJ, Smith G. Spain: Churchill Livingstone; 2001:223-237.
19. Klein-Schwartz W, Anderson B: Analysis of sertraline-only overdoses. Am J Emerg Med 1996, 14:456-458.
20. Müller TC, Rocha JB, Morsch VM, Neis RT, Schetinger MR: Antidepressants inhibit human acetylcholinesterase and butyrylcholinesterase activity. Biochim Biophys Acta 2002,1587:92-98

Case Report

Indian Journal of Anesthesia and Analgesia
Volume 9 Number 3 May-June 2022
DOI: http://dx.doi.org/10.21088/ijaa.2349.8471.9322.16

Anesthetic Management of Dilated Cardiomyopathy for Cesarean Section

Paidmuddala Yashwanth[1], Vishnuvardhan V[2], Sravanthi GNS[3], Ravi Madhusudhana[4]

Author's Affiliation: [1]Junior Resident, [2]Associate Professor, [3]Senior Resident, [4]Professor & HOD, Department of Anesthesiology, Sri Devaraj Urs Medical College, SDUAHER, Kolar 563101, Karnataka, India.

Abstract

Introduction:Dilated cardiomyopathy(DCM) is one of the most common types of non ischemic heart muscle disease among the adult population, and it is associated with a high perioperative mortality.

Case Report: A 33-year-old female, G2P1L1+1 at 37 weeks of gestation admitted electively for cesarean section who is a known case of DCM with an ejection fraction of 40%.

In the preoperative evaluation, patient has a history of shortness of breath on mild to moderate physical exercise, 12-lead electrocardiography (ECG) showed sinus rhythm with occasional premature ventricular complexes and other parameters are normal.

Echocardiogram (Echo) showed severely dilated left ventricle with moderately to severely reduced systolic function due to global hypokinesia and indeterminate filling pressures, and no thrombi were present. All monitoring parameters were connected and an awake arterial line was inserted first followed by epidural in the sitting position. Inj. bupivacaine 0.25% 20 mL + 40 µgn fentanyl was given into the epidural space. The depth of the epidural space was 9.5 cm, while the depth of the catheter was 5.5 cm. The epidural was uneventful, and we changed the patient position into a supine position. Intravenous fluids were maintained at 60–80 mL/h. Intra operative vitals are stable and baby was extracted and blood loss around 700ml.Patient shifted to ICU for close monitoring.

Conclusion: Dilated cardiomyopathy is associated with high mortality and persistewnt decrease in quality of mother. Careful selection of drugs and best anesthetic techniques is important for good maternal and fetal outcome.

Keywords: Dilated cardiomyopathy; Caesarean section.

Key Messages: Dialted cardiomyopathy is challenging task for an anesthesiologist and most of the patients who have DCM will be left undiagnosed peripartum period especially in the developing countries like India. Most of the patients who undergo cessarean section will be on emergency basis rather than elective. So, Anesthesiologist won't be having enough time in evaluating patients pre operatively. Any pre operative suspicion of DCM and intraoperative suspicion of persistent hypotension and tachycardia should be evaluated intraoperatively by bedside echocardiography. This bedside USG cardiac assesment should be used as an diagnostic tool by an anaesthesiologist in operation theatre helps in reduce the ICU stay of the patient and good prognosis.

How to cite this article:

Paidmuddala Yashwanth, Vishnuvardhan V, Sravanthi GNS, et al./Anesthetic Management of Dilated Cardiomyopathy for Cesarean Section/Indian J Anesth Analg. 2022;9(3):149-151.

Corresponding Author: Vishnuvardhan V, Associate Professor, Department of Anesthesiology, Sri Devaraj Urs Medical College, SDUAHER, Kolar 563101, Karnataka, India.
E-mail: voletivishnu@gmail.com
Received on: 19.04.2022, **Accepted on:** 03.05.2022

Introduction

Dilated cardiomyopathy (DCM) is one of the most common types of non ischemic heart muscle disease among the adult population, and it is associated with a high perioperative mortality.

Systolic function impairment and left ventricular or biventricular enlargements are the hallmark of DCM which have a significant impact on myocardial contractility.[1,2] Despite the high prevalence of DCM among adults, limited evidence has been published regarding the ideal anesthetic management in non cardiac surgery.[2] In this report, we describe successful management of a case of DCM that underwent cesarean section under neuraxial blockade (epidural anesthesia) with successful outcome.

Case Report

A 33 year old female, G2P1L1 at 37 weeks gestation admitted electively for cesarean section. She is a newly diagnosed Dilated cardiomyopathy (DCM) and completely asymptomatic.

In the preoperative evaluation, the patient was doing well, with no active complaint and good fetal movement with no history of vaginal leakage. She has a history of shortness of breath on moderate physical exercise, unable to climb a flight of stairs without becoming breathless. On examination, she was 165 cm tall and weighed 90.3 kg with body mass index of 33.2, her heart rate (HR) was 97/ min and blood pressure (BP) was 125/71 mmHg, and her SpO 2 was 99% while breathing room air. There were no features suggestive of congestive heart failure. Routine laboratory investigations were within normal limits with a hemoglobin level of 10.3g/dL. Chest X-ray show cardiomegaly. 12-lead electrocardiography (ECG) showed sinus (Fig. 1) rhythm with occasional premature ventricular complexes, otherwise normal ECG. Cardiology opinion was taken regarding ECG changes and Cardiomegaly on Chest X ray.

Echocardiogram (Echo) showed Global hypokinesia. of LV(total anterior and lateral walls are hypokinetic), Dilated LV with moderate eccentric MR, mild TR, mild PAH, thin IAS septum, Mild LV systolic dysfunction with preserved ejection fraction of 40%.Patient was diagnosed as Peripartum cardiomyopathy and advised Inj. Lasix 120mg stat, Tab. Spironolactone 25mg OD. Cardiologist suggested for elective LSCS after symptomatic improvement in cardiac congestion and Inj. Lasix 40mg to be given 1hr prior to the surgical procedure and the same has been same followed.

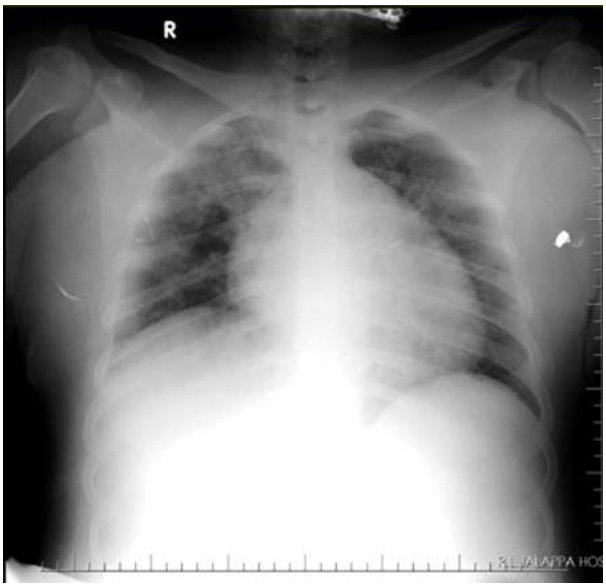


Fig. 1: X-ray showing Dilated Cardiomyopathy.

The last formal ultrasound (US) on 37 weeks 1 day showed an estimated fetal weight of 2.8 kg, cephalic with normal amniotic fluid, and normal Doppler. The epidural anesthesia technique was explained to the patient, and the consent was signed.

The plan was to admit her for cesarean section after cardiology clearance. The plan of anesthesia is to proceed with epidural anesthesia with a backup plan of general anesthesia.

Routine non invasive monitoring was established, including noninvasive blood pressure, hr, pulse oximetry (SpO 2), and ECG. Her SpO2 was 99% on face mask 5 L/min, and ECG results showed normal sinus rhythm. An awake arterial line was inserted first followed by epidural in the sitting position,. Two large intravenous accesses were inserted. The crash cart was brought in the operative room, and inotropes and vasopressors instead of mephentermine were kept ready to go The patient was very anxious; midazolam 1 mg was administered before epidural, and then 2mL of 2% lidocaine was used for local infiltration anesthesia at L3–4 space. The epidural space was located with an 18-G Tuohy needle at the first attempt. After confirming the space by loss of resistance, Test dose of 2%lidocaine with adrenaline 3ml given to confirm space followed by 0.5% Bupivicaine 6ml + 20mcg Fentanyl was given into the epidural space. The depth of the epidural space was 5cm, while epidural catheter was placed at 9cm. The epidural was uneventful, and we changed the patient position into a supine position.

Intravenous fluids were maintained at 60–80 mL/h. Intra operative BP was 110/70 mmHg. Successful neuraxial blockade level was achieved till T6 and surgeons were asked to proceed with LSCS and a baby girl was delivered. Uterotonic medications were administered, with estimated blood loss of around 700 mL. The surgery lasted for 45 min. The Apgar score for the newborn infant was 9 points. Surgical procedure was uneventful. The patient was admitted to the High dependency unit (HDU) for observation as she is in a high risk for having decompensated heart failure in post operative period. On cardiologist advice, post operatively Inj.Lasix 5mg/hr continuous infusion for 16hrs and later on switched to Inj. Lasix 40mg-20mg-20mg. She was stable in the HDU, and they transferred her back to the ward with a stable condition after 24 h. No perioperative or anesthetic complications occurred. The patient was discharged home 1 week later with cardiology reference.

Discussion

DCM is a diagnosis of exclusion and our case fulfilled all the diagnostic criteria. Treatment of DCM is similar to other types of congestive heart failure. The mainstay of therapy is a combination of diuretics, sodium restriction, anticoagulation and beta blockers. The cardiology consult did not include thromboprophylaxis in the treatment of this patient.[3]

The ultimate goal of Peripartum cardiomyopathy is to avoid changes in hemodynamics General anesthesia involves the use of cardio depressant drugs like thiopentone, narcotics and/or inhalational agents. The use of opioid based induction may necessitate post operative ventilation for both mother and new born. Performing a rapid sequence induction on a patient with compromised cardiac function can be extremely challenging. Thus, a carefully administered regional anesthetic is advantageous. In addition to avoiding the stress of laryngoscopy and intubation, the vasodilatation produced by regional anesthesia is beneficial with isolated left ventricular dysfunction. We chose epidural anesthesia as it permits gradual and controlled induction with minimal variation in hemodynamic parameters when accompanied by judicious administration of intravenous fluids and inotropes. 0.5% Bupivacaine was selected as it is long acting, gives surgical anesthesia of good quality with early recovery from motor blockade. Oxytocin after delivery was administered intravenously as a slow infusion to prevent sudden vasodilatation causing hypotension and tachycardia.

Post operative period is important in PPCM as reabsorption of third space fluid after 48 hours of LSCS may increase preload causing congestive cardiac failure.[6] Epidural top up of 0.125% of Bupivicaine 8ml 8th hrly was continued for post operative analgesia; to avoid post operative pain associated hemodynamic variations. To conclude, in developing nations, where not all parturients undergo regular antenatal checkups, high degree of clinical suspicion is important for early diagnosis and anesthetic management of PPCM thereby increasing chances of successful patient outcome. Titrated epidural anesthesia with judicious fluid and inotropic support is a prudent choice in such cases.

Conclusion

Dilated cardiomyopathy is a associated with high morbidity and mortality and can lead to maternal and fetal loss and persistent decrease in quality of life in mother. Early diagnosis, prompt monitoring and post operative follow up remains main stay of treatment. Principles of management is to prevent sudden hemodynamic changes and conscious administration of drugs which alter the hemodynamics gives good maternal and fetaloutcome.

Conflict of Interest: NIL

References

1. Dec GW, Fuster V. Idiopathic dilated cardiomyopathy. N Engl J Med. 1994;331:1564–75.
2. Chen CQ, Wang X, Zhang J, Zhu SM. Anesthetic management of patients with dilated cardiomyopathy for noncardiac surgery. Eur Rev Med Pharmacol Sci. 2017;21:627–34.
3. Kumar M, Batra M, Raj R. Anaesthetic management of a case of dilated cardiomyopathy for emergency appendectomy. Anesth Essays Res. 2014;8:105.
4. Brown G, O'Leary M, Douglas I, Herkes R. Perioperative management of a case of severe peripartum cardiomyopathy. Anaesth Intens Care. 1992;20:80–3
5. Dutt A, Agarwal A, Chatterji R, Ahmed F. Anesthetic management for caesarean section in a case of peripartum cardiomyopathy. Anesth Essays Res. 2013;7:273.
6. Kaur H, Khetarpal R, Aggarwal S. Dilated cardiomyopathy: an anaesthetic challenge. J ClinDiagn Res. 2013;7(6):1174-1176.

Guidelines for Authors

Manuscripts must be prepared in accordance with "Uniform requirements for Manuscripts submitted to Biomedical Journal" developed by international committee of medical Journal Editors

Types of Manuscripts and Limits

Original articles: Up to 3000 words excluding references and abstract and up to 10 references.

Review articles: Up to 2500 words excluding references and abstract and up to 10 references.

Case reports: Up to 1000 words excluding references and abstract and up to 10 references.

Online Submission of the Manuscripts

Articles can also be submitted online from http://rfppl.co.in/customer_index.php.

I) First Page File: Prepare the title page, covering letter, acknowledgement, etc. using a word processor program. All information which can reveal your identity should be here. use text/rtf/doc/PDF files. Do not zip the files.

2) Article file: The main text of the article, beginning from Abstract till References (including tables) should be in this file. Do not include any information (such as acknowledgement, your name in page headers, etc.) in this file. Use text/rtf/doc/PDF files. Do not zip the files. Limit the file size to 400 Kb. Do not incorporate images in the file. If file size is large, graphs can be submitted as images separately without incorporating them in the article file to reduce the size of the file.

3) Images: Submit good quality color images. Each image should be less than 100 Kb in size. Size of the image can be reduced by decreasing the actual height and width of the images (keep up to 400 pixels or 3 inches). All image formats (jpeg, tiff, gif, bmp, png, eps etc.) are acceptable; jpeg is most suitable.

Legends: Legends for the figures/images should be included at the end of the article file.

If the manuscript is submitted online, the contributors' form and copyright transfer form has to be submitted in original with the signatures of all the contributors within two weeks from submission. Hard copies of the images (3 sets), for articles submitted online, should be sent to the journal office at the time of submission of a revised manuscript. Editorial office: Red Flower Publication Pvt. Ltd., 48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi – 110 091, India, Phone: 91-11-79695648, Cell: +91-9821671871. E-mail: author@rfppl.co.in. Submission page: http://rfppl.co.in/article_submission_system.php?mid=5.

Preparation of the Manuscript

The text of observational and experimental articles should be divided into sections with the headings: Introduction, Methods, Results, Discussion, References, Tables, Figures, Figure legends, and Acknowledgment. Do not make subheadings in these sections.

Title Page

The title page should carry

1) Type of manuscript (e.g. Original article, Review article, Case Report)
2) The title of the article, should be concise and informative;
3) Running title or short title not more than 50 characters;
4) The name by which each contributor is known (Last name, First name and initials of middle name), with his or her highest academic degree(s) and institutional affiliation;
5) The name of the department(s) and institution(s) to which the work should be attributed;
6) The name, address, phone numbers, facsimile numbers and e-mail address of the contributor responsible for correspondence about the manuscript; should be mentoined.
7) The total number of pages, total number of photographs and word counts separately for abstract and for the text (excluding the references and abstract);
8) Source(s) of support in the form of grants, equipment, drugs, or all of these;
9) Acknowledgement, if any; and
l0) If the manuscript was presented as part at a meeting, the organization, place, and exact date on which it was read.

Abstract Page

The second page should carry the full title of the manuscript and an abstract (of no more than 150 words for case reports, brief reports and 250 words for original articles). The abstract should be structured and state the Context (Background), Aims, Settings and Design, Methods and Materials, Statistical analysis used, Results and Conclusions. Below the abstract should provide 3 to 10 keywords.

Introduction

State the background of the study and purpose of the study and summarize the rationale for the study or observation.

Methods

The methods section should include only information that was available at the time the plan or protocol for the study was written such as study approach, design, type of sample, sample size, sampling technique, setting of the study, description of data collection tools and methods; all information obtained during the conduct of the study belongs in the Results section.

Reports of randomized clinical trials should be based on the CONSORT Statement (http:// www. consort-statement. org). When reporting experiments on human subjects, indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000 (available at http://www.wma. net/e/policy/l 7-c_e.html).

Results

Present your results in logical sequence in the text, tables, and illustrations, giving the main or most important findings first. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize only important observations. Extra or supplementary materials and technical details can be placed in an appendix where it will be accessible but will not interrupt the flow of the text; alternatively, it can be published only in the electronic version of the journal.

Discussion

Include summary of key findings (primary outcome measures, secondary outcome measures, results as they relate to a prior hypothesis); Strengths and limitations of the study (study question, study design, data collection, analysis and interpretation); Interpretation and implications in the context of the totality of evidence (is there a systematic review to refer to, if not, could one be reasonably done here and now?, What this study adds to the available evidence, effects on patient care and health policy, possible mechanisms)? Controversies raised by this study; and Future research directions (for this particular research collaboration, underlying mechanisms, clinical research). Do not repeat in detail data or other material given in the Introduction or the Results section.

References

List references in alphabetical order. Each listed reference should be cited in text (not in alphabetic order), and each text citation should be listed in the References section. Identify references in text, tables, and legends by Arabic numerals in square bracket (e.g. [10]). Please refer to ICMJE Guidelines (http://www.nlm.nih.gov/bsd/uniform_ requirements.html) for more examples.

Standard journal article

[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540–7.

[2] Twetman S, Axelsson S, Dahlgren H, Holm AK, Källestål C, Lagerlöf F, et al. Caries-preventive effect of fluoride toothpaste: A systematic review. Acta Odontol Scand 2003; 61: 347–55.

Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone-iodine antisepsis. State of the art. Dermatology 1997; 195 Suppl 2: 3–9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. J Periodontol 2000; 71: 1792–801.

Unpublished article

[5] Garoushi S, Lassila LV, Tezvergil A, Vallittu PK. Static and fatigue compression test for particulate filler composite resin with fiber-reinforced composite substructure. Dent Mater 2006.

Personal author(s)

[6] Hosmer D, Lemeshow S. Applied logistic regression, 2nd edn. New York: Wiley-Interscience; 2000.

Chapter in book

[7] Nauntofte B, Tenovuo J, Lagerlöf F. Secretion and composition of saliva. In: Fejerskov O,

Kidd EAM, editors. Dental caries: The disease and its clinical management. Oxford: Blackwell Munksgaard; 2003. pp 7–27.

No author given

[8] World Health Organization. Oral health surveys - basic methods, 4th edn. Geneva: World Health Organization; 1997.

Reference from electronic media

[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979–2001. www.statistics.gov.uk/downloads/theme_health/HSQ20.pdf (accessed Jan 24, 2005): 7–18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

More information about other reference types is available at www.nlm.nih.gov/bsd/uniform_requirements.html, but observes some minor deviations (no full stop after journal title, no issue or date after volume, etc.).

Tables

Tables should be self-explanatory and should not duplicate textual material.

Tables with more than 10 columns and 25 rows are not acceptable.

Table numbers should be in Arabic numerals, consecutively in the order of their first citation in the text and supply a brief title for each.

Explain in footnotes all non-standard abbreviations that are used in each table.

For footnotes use the following symbols, in this sequence: *, ¶, †, ‡‡,

Illustrations (Figures)

Graphics files are welcome if supplied as Tiff, EPS, or PowerPoint files of minimum 1200x1600 pixel size. The minimum line weight for line art is 0.5 point for optimal printing.

When possible, please place symbol legends below the figure instead of the side.

Original color figures can be printed in color at the editor's and publisher's discretion provided the author agrees to pay.

Type or print out legends (maximum 40 words, excluding the credit line) for illustrations using double spacing, with Arabic numerals corresponding to the illustrations.

Sending a revised manuscript

While submitting a revised manuscript, contributors are requested to include, along with single copy of the final revised manuscript, a photocopy of the revised manuscript with the changes underlined in red and copy of the comments with the point-to-point clarification to each comment. The manuscript number should be written on each of these documents. If the manuscript is submitted online, the contributors' form and copyright transfer form has to be submitted in original with the signatures of all the contributors within two weeks of submission. Hard copies of images should be sent to the office of the journal. There is no need to send printed manuscript for articles submitted online.

Reprints

Journal provides no free printed, reprints, however a author copy is sent to the main author and additional copies are available on payment (ask to the journal office).

Copyrights

The whole of the literary matter in the journal is copyright and cannot be reproduced without the written permission.

Declaration

A declaration should be submitted stating that the manuscript represents valid work and that neither this manuscript nor one with substantially similar content under the present authorship has been published or is being considered for publication elsewhere and the authorship of this article will not be contested by any one whose name(s) is/are not listed here, and that the order of authorship as placed in the manuscript is final and accepted by the co-authors. Declarations should be signed by all the authors in the order in which they are mentioned in the original manuscript. Matters appearing in the Journal are covered by copyright but no objection will be made to their reproduction provided permission is obtained from the Editor prior to publication and due acknowledgment of the source is made.

Approval of Ethics Committee

We need the Ethics committee approval letter from an Institutional ethical committee (IEC) or an institutional review board (IRB) to publish your Research article or author should submit a statement that the study does not require ethics approval along with evidence. The evidence could either be consent from patients is available and there are no ethics issues in the paper or a letter from an IRB stating that the study in question does not require ethics approval.

Abbreviations

Standard abbreviations should be used and be spelt out when first used in the text. Abbreviations should not be used in the title or abstract.

Checklist

- Manuscript Title
- Covering letter: Signed by all contributors
- Previous publication/ presentations mentioned, Source of funding mentioned
- Conflicts of interest disclosed

Authors

- Middle name initials provided.
- Author for correspondence, with e-mail address provided.
- Number of contributors restricted as per the instructions.
- Identity not revealed in paper except title page (e.g. name of the institute in Methods, citing previous study as 'our study')

Presentation and Format

- Double spacing
- Margins 2.5 cm from all four sides
- Title page contains all the desired information. Running title provided (not more than 50 characters)
- Abstract page contains the full title of the manuscript
- Abstract provided: Structured abstract provided for an original article.
- Keywords provided (three or more)
- Introduction of 75–100 words
- Headings in title case (not ALL CAPITALS). References cited in square brackets
- References according to the journal's instructions

Language and grammar

- Uniformly American English
- Abbreviations spelt out in full for the first time. Numerals from 1 to l0 spelt out
- Numerals at the beginning of the sentence spelt out

Tables and figures

- No repetition of data in tables and graphs and in text.
- Actual numbers from which graphs drawn, provided.
- Figures necessary and of good quality (color)
- Table and figure numbers in Arabic letters (not Roman).
- Labels pasted on back of the photographs (no names written)
- Figure legends provided (not more than 40 words)
- Patients' privacy maintained, (if not permission taken)
- Credit note for borrowed figures/tables provided
- Manuscript provided on a CDROM (with double spacing)

Submitting the Manuscript

- Is the journal editor's contact information current?
- Is the cover letter included with the manuscript? Does the letter:

1. Include the author's postal address, e-mail address, telephone number, and fax number for future correspondence?
2. State that the manuscript is original, not previously published, and not under concurrent consideration elsewhere?
3. Inform the journal editor of the existence of any similar published manuscripts written by the author?
4. Mention any supplemental material you are submitting for the online version of your article. Contributors' Form (to be modified as applicable and one signed copy attached with the manuscript)