RESEARCH

# STUDY COMPARING BUPIVACAINE ALONE AND BUPIVACAINE WITH DEXMEDETOMIDINE FOR POSTOPERATIVE ANALGESIA DURING CAESAREAN SECTION UNDER SPINAL ANAESTHESIA

**Yogesh Tilkar[1], Shailendra Dawer[2], Ranjita Aske Dawer[1], Sachin Kumbhare[3]**

[1]Associate Professor, Department of Anesthesiology, Government Autonomous Medical College, Ratlam, Madhya Pradesh, India.
[2]Professor & Head, Department of Anesthesiology, Government Autonomous Medical College, Ratlam, Madhya Pradesh, India.
[3]Assistant Professor, Department of Anesthesiology, Government Autonomous Medical College, Ratlam, Madhya Pradesh, India.

*Received* : 10/03/2022
*Received in revised form* : 08/07/2022
*Accepted* : 21/07/2022

*Keywords:*
*Dexmedetomidine,*
*Cesarean Surgery,*
*Somato-Visceral Sensory Block,*
*Postoperative Analgesia*

Corresponding Author:
**Dr. Sachin Kumbhare,**
Email. sachinkumbhare21@gmail.com
ORCID: 0000-0003-2506-2470

DOI: 10.47009/jamp.2022.4.3.56

Source of Support: Nil,
Conflict of Interest: None declared

*Int J Acad Med Pharm*
2022; 4 (3); 244-250

## Abstract

**Background:** The aim of study is to compare bupivacaine only and bupivacaine with dexmedetomidine for postoperative analgesia during spinal anaesthesia in caesarean section. **Materials and Methods:** Interventional randomised control study, from June 2021 to August 2021. After institutional ethical committee approval, 50 gravidas undergoing caesarean section under spinal anaesthesia were selected. A detailed history, complete physical examination and investigations were done for all. The study population will be randomly divided into 2 groups with 25 females in each group. Group A: Who receive Bupivacaine 0.5% alone. Group B: Who receive Bupivacaine 0.5% with dexmedetomidine 5mcg. **Result:** Changes observed in systolic, diastolic and mean blood pressure were comparable in both the groups at different time points (P>0.05). Three patients in Group A and in Group B developed hypotension which responded to intravenous fluid therapy. SpO2 remained stable and comparable in both the groups throughout the study period, (P>0.05). There was significant prolongation of analgesia in Group B where first rescue analgesic was required after 9 hours of subarachnoid blockade. Patients in Group A required rescue analgesic at 7 hours after subarachnoid blockade. There was statistically significant difference in duration of analgesia in two groups. Postoperative analgesia was significantly prolonged in Group B as compared to Group A. **Conclusion:** Dexmedetomidine as an adjuvant to Bupivacaine did not show significant difference in onset and peak of sensory blockade but Dexmedetomidine provided prolonged duration of sensory blockade and postoperative analgesia as compared to Bupivacaine alone group.

## INTRODUCTION

Spinal anaesthesia is the most commonly used neuraxial anaesthetic technique for caesarean section as it is easy, has accuracy rate higher than epidural anaesthesia, and procedure takes less time to perform and provides simple, effective and safe analgesia during perioperative period. The surgery on urerus produces visceral pain for which block up to dermatome T6 level is necessary to prevent maternal discomfort which is also accompanied with side effects like haemodynamic instability and reduced utero-placental circulation.[1]

Dexmedetomidine [DXM], a highly selective α2 adrenergic receptor agonist, potentiates local anaesthetic effects, prolongs postoperative analgesia, and has a dose-dependent sedative effect. The mechanism of action of intrathecal α2 –adrenoceptor agonists is not well understood; they may have an additive or synergistic effect to local anaesthetics trough binding to the pre-synaptic C-fibres and postsynaptic dorsal horn neurons producing analgesia by depressing the release of C-fibre neurotransmitters and hyperpolarization of postsynaptic dorsal horn cells.[2] Following intrathecal administration of DXM 5 µg as an adjuvant with hyperbaric bupivacaine for uncomplicated caesarean deliveries, Mahdy W R et al found good quality of spinal anaesthesia with no adverse effects on mothers and neonates.[3] Intravenous DXM has been successfully used as an adjunct for labour analgesia and caesarean delivery, with favourable maternal and foetal outcome. Isolated perfused human placental studies have shown that because of the higher lipophilicity of DXM, there is greater placental tissue retention and


ISSN (O): 2687-5365; ISSN (P): 2753-6556

minimal transport into the foetal circulation.[4,5] However, DXM is being safely used in neonates and infants for sedation in intensive care setups. DXM has been safely used as an adjuvant for subarachnoid block in urological, orthopaedic and lower abdominal surgical procedures. DXM, a highly selective α2 adenergic agonist is being used in the peripoerative, critical care settings and also as an adjunct to regional anaesthesia.

In view of previous studies showing dexmedetomidine efficacy as an adjunct to heavy bupivacaine, our study aimed to compare the bupivacaine heavy alone with dexmedetomidine as an adjuvant in caesarean patients scheduled under spinal anaesthesia. We have choose this study because this type of study and use of dexmedetomidine have not done before in Ratlam and in our college also this type of study not done by anaesthesia department. This type of study and dose of drugs used before for research paper, but we have taken large sample size as compared to other previous studies.

## MATERIALS AND METHODS

This is a 3 months interventional randomised control study between 2 groups will be conducted by the Department of Anesthesiology, GMC, Ratlam. All caesarean cases should be selected from cases in operation theatre of M.C.H. O.T. of District Hospital Ratlam. Data of all the caesarean cases done collected and make available by the faculty members of department of Anesthesiology, GMC, Ratlam.

Study area and participants: Interventional randomised control study will be conducted by the all the investigators of Department of Anesthesiology, Government Medical College, Ratlam. All data collection of this study collected and make available by the investigators of Department of Anesthesiology, GMC, Ratlam.

**Inclusion Criteria**

1. ASA grade 1 and 2 Full term pregnant female undergoing elective/emergency caesarean section under subarachnoid block, all shouid be willing for being the subject of study.
2. Gravidas given informed, written and valid consent.

**Exclusion Criteria**

1. Patient's refusal for procedure.
2. Patients with significant coagulopathy and other contraindications for spinal anaesthesia.
3. Patients with PIH. 4) Patients belonging to ASA class 3, 4 and 5.
4. Allergy to local anaesthetics.
5. Patients with significant systemic disorders.

**Study Design-** Interventional randomised control study.

**Sample Size:** Total 50 gravidas (25 cases in each of two groups) will be taken as subjects with written informed consent. (Sample size calculated by formula: $N7/ (Z\alpha + Z\beta)2 \times Z \times \sigma2 + d$. [$Z\alpha$= 95 and CI= 1.96, $Z\beta$=80, Power= 0.84])

**Study Period:** From June 2021 to August 2021.

**Data Collection:** After institutional ethical committee approval, 50 gravidas undergoing caesarean section under spinal anaesthesia will be selected. A detailed history, complete physical examination and investigations will be done for all. Informed written consent will be taken for participation in study. The study population will be randomly divided into 2 groups with 25 females in each group.

**Group A:** Who receive Bupivacaine 0.5% alone.

**Group B:** Who receive Bupivacaine 0.5% with dexmedetomidine 5mcg.

**Informed Consent:** Informed consent form in the accepted given format attached with this project submission format.

## RESULTS

**Table 1: Demographic Profile of Patients**

| Variables | Group A | Group B | P value |
|---|---|---|---|
| Age (years) | 27.18 ±09.72 | 27.28 ± 10.14 | 0.9600 |
| Weight (in kg) | 64.32 ± 04.54 | 65.46 ± 12*42 | 0.3897 |

[Table 1] showing demographic profile of patients in two groups according to age and weight.

**Table 2: Comparison of Sensory Characteristics of Subarachnoid Block between Two Groups.**

| Variables | | Group A | Group B | P Value |
|---|---|---|---|---|
| Highest sensory level achieved (range) | | T6 – T8 | T6 – T8 | 0.1713 |
| Onset of sensory block (min) | At $L_1$ dermatome | 01.4 ± 00.45 | 01.50 ± 00.40 | 0.2466 |
| | At $T_{10}$ dermatome | 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) | $L_1$ dermatome | 02.71 ± 00.84 | 02.9 ± 00.47 | 0.3591 |
| | $T_{10}$ dermatome | 04.64 ± 01.36 | 04.81 ± 00.93 | 0.4555 |
| | Highest sensory level | 14.69 ± 01.36 | 16.26 ±0.72 | 0.1218 |
| 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.


ISSN (O): 2687-5365; ISSN (P): 2753-6556

**Table 3: Showing Comparison of Motor Characteristics of Subarachnoid Block between Two Groups**

| Variables | Group A (Mean ± SD) | Group B (Mean ± SD) | 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 |

**Inference:** There was no statistically significant difference in onset of motor block in two groups. But there was statistically significant difference in regression of motor block. There was delayed regression of motor block in group B as compared to group A, (P<0.0001).

**Table 4: Statistical Analysis of Pulse Rate (per/min)**

| Pulse rate per minute at different time points. | Group A (Mean ± SD) | Group B (Mean ± SD) | P value |
|---|---|---|---|
| Baseline | 84.66 ± 07.03 | 83.80 ±07.40 | 0.54 |
| Just after block | 84.66 ± 06.85 | 85.12 ±06.88 | 0.73 |
| 2 min after block | 83.82 ± 06.65 | 84.22 ± 07.44 | 0.77 |
| 4 min after block | 80.92 ± 06.43 | 82.82 ± 07.24 | 0.16 |
| 6 min after block | 80.02 ±05.72 | 81.78 ±06.84 | 0.16 |
| 8 min after block | 78.94 ±05.50 | 79.90 ±06.95 | 0.44 |
| 10 min after block | 76.46 ±04.71 | 78.74 ±06,79 | 0.05 |
| 20 min after block | 75.42 ±05.73 | 77.26 ±05.49 | 0.10 |
| 30 min after block | 74.06 ± 04.70 | / 75.72 ±05.28 | 0.10 |
| 40 min after block | 73.12 ± 05.56 | 74.98 ± 04.76 | 0.07 |
| 50 min after block | 74.18 ± 04.89 | 74.40 ±05.29 | 0.82 |
| 60 min after block | 72.28 ± 04.55 | 73.20 ±05.20 | 0.34 |
| 1 hr 10 min after block | 71.08 ±05.09 | 72.86 ± 04.47 | 0.06 |
| 1 hr 20 min after block | 71.18 ± 04.19 | 72.90 ± 04.86 | 0.06 |
| 1 hr 30 min after block | 71.30 ±04.06 | 73.00 ± 04.70 | 0.05 |
| 1 hr 40 min after block | 71.68 ±03.58 | 72.90 ±04.83 | 0.15 |
| 1 hr 50 min after block | 71.12 ±03.52 | 72.30 ±09.74 | 0.42 |
| 2 hr after block | 72.36 ± 02.95 | 73.76 ±04.20 | 0.05 |
| 2 hr 30 min after block | 72.52 ± 03.14 | 73.90 ± 04.28 | 0.06 |

**Table 5: Systolic Blood Pressure, Diastolic Blood Pressure and Mean Arterial Pressure**

| Blood Pressure at different time points | Systolic Blood Pressure | | | Diastolic Blood Pressure | | | Mean Arterial Pressure | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group A | Group B | P | Group A | Group B | P | Group Al | Group B | P |
| Baseline | 125.0 ± 05.94 | 122.3 ± 07.83 | 0.05 | 77.82 ± 04.60 | 77.20 ± 04.60 | 0.51 | 93.50 ± 03.65 | 92.10 ± 04.40 | 0.08 |
| Just after block | 125.2 ± 07.84 | 122.7 ± 07.19 | 0.09 | 77.62 ± 04.28 | 76.32 ± 06.24 | 0.22 | 93.34 ± 04.57 | 94.98 ± 25.11 | 0.65 |
| 2 min after block | 121.4± 06.65 | 120.2 ± 07.26 | 0.41 | 75.30 ± 04.83 | 74.94 ± 05.80 | 0.74 | 90.72 ± 04.33 | 90.00 ± 05.06 | 0.44 |
| 4 min | 119.6 ± 05.87 | 118.4 ± 06.95 | 0.33 | 74.42 ± 05.76 | 74.42 ± 06.89 | 0.99 | 89.04 ± 05.36 | 89.04 ± 05.95 | 0.99 |
| 6 min | 117.3 ± 06.64 | 115.9 ± 07.79 | 0.35 | 74.16 ± 04.40 | 72.80 ± 07.34 | 0.26 | 88.44 ± 04.27 | 86.98 ± 07.46 | 0.23 |
| 8 min | 113.2 ± 06.26 | 113.9 ± 07.82 | 0.62 | 72.16 ± 05.08 | 72.70 ± 06.80 | 0.65 | 86.04 ± 05.08 | 86.40 ± 06.52 | 0.76 |
| 10 min | 111.6 ± 06.11 | 111.9 ± 08.29 | 0.82 | 72.12 ± 04.85 | 71.94 ± 06.27 | 0.87 | 85.14 ± 04.40 | 85.32 ± 05.88 | 0.86 |
| 20 min | 110.7 ± 06.11 | 111.1 ± 07.99 | 0.76 | 71.66 ± 05.17 | 71.32 ± 06.01 | 0.76 | 84.72 ± 04.52 | 84*.64 ^ 05.73 | 0.93 |
| 30 min | 108.2 ± 04.98 | 109.3 ± 08.40 | 0.41 | 70.44 ± 04.17 | 69.68 ± 05.38 | 0.43 | 83.06 ± 03.84 | 82.82 ± 05.26 | 0.79 |
| 40 min | 105.6 ± 05.94 | 108.1 ± 08.16 | 0.08 | 70.86 ± 07.03 | 68.60 ± 05.80 | 0.08 | 82.42 ± 05.85 | 81.72 ± 05.25 | 0.53 |
| 50 min | 106.7 ± 04.86 | 108.7 ± 09.97 | 0.21 | 70.02 ± 04.60 | 69.20 ± 05.80 | 0.43 | 82.26 ± 03.80 | 82.36 ± 05.93 | 0.92 |
| 60 min | 108.9 ± 05.59 | 110.3 ± 08.32 | 0.32 | 7L62 ± 03.90 | 69.82 ± 05.63 | 0.06 | 83.92 ± 03.39 | 83.26 ± 05.17 | 0.45 |
| 1 hr 10 Min | 110.3 ± 05.61 | 111.5 ± 08.08 | 0.38 | 71.46 ± 05.25 | 70.18 ± 09.44 | 0.40 | 84.26 ± 04.31 | 83.98 ± 06.60 | 0.80 |
| 1 hr 20 min | 112.9 ± 5.62 | 112.7 ± 07.89 | 0.88 | 71.74 ± 03.33 | 71.46 ± 04.04 | 0.64 | 85.38 ± 02.50 | 85.26 ± 04.29 | 0.86 |
| 1 hr 30 min | 114.6 ± 05.64 | 114.6 ± 08.87 | 0.99 | 72.36 ± 03.89 | 71.96 ± 04.13 | 0.61 | 86.40 ± 03.30 | 86.18 ± 04.57 | 0.78 |
| 1 hr 40 min | 114.5 ± 05.69 | 116.4 ± 08.71 | 0.19 | 71.98 ± 03.72 | 72.14 ± 04.33 | 0.84 | 86.12 ± 03.44 | 86.88 ± 04.87 | 0.37 |


ISSN (O): 2687-5365; ISSN (P): 2753-6556

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 hr 50 min | 115.3± 16 | 116.5± 08.85 | 0.41 | 71.44± 03.87 | 72.80± 03.85 | 0.08 | 86.06 ± 03.65 | 87.52 ± 04.45 | 0.07 |
| 2 hr | 117.7 ± 05.74 | 116.6 ± 09.07 | 0.49 | 73.08 ± 03.96 | 72.76± 03.07 | 0.65 | 87.98 ± 03.66 | 87.42 ± 04.04 | 0.46 |
| 2 hr 30 min | 118.6 ± 06.65 | 116.6 ± 09.01 | 0.21 | 72.50 ± 03.78 | 72.30± 03.84 | 0.78 | 87.82 ± 03.41 | 87.08 ± 04.64 | 0.37 |

**Table 6: Visual Analogue Scale**

| Time | Group A (Mean ± SD) | Group B (Mean ± SD) | P Value |
|---|---|---|---|
| 1 hr after block | 0 | 0 | - |
| 2 hr after block | 0 | 0 | |
| 4 hr after block | 0. | 0 | - |
| 5 hr after block | 0 | 0 | - |
| 6 hr after block | 3.5 ± 1.24 | 0.38 ±0.83 | <0.0001 |
| 7 hr after block | 5.26 ±0.12 (rescue analgesic given) | 1.96 ±0.32 | <0.0001 |

**Table 7: Statistical Comparison of Duration of Effective Analgesia Between Two Groups**

| Variable | Group A (Mean ± SD) | Group B (Mean ± SD) | P Value |
|---|---|---|---|
| Duration of effective analgesia (minutes) | 401 ± 34.71 | 526.4 ± 27.38 | <0.0001 |

**Table 8: Complications in Two Groups**

| Complications | Group A No. of patients % | Group B No. of patients % |
|---|---|---|
| Hypotension | 3.06% | 3.06% |
| Bradycardia | 3.06% | 3.02% |
| N ausea-V omitting | 4.08% | 6.12% |
| Headache | 0.00% | 0.00% |
| Respiratory depression | 0.00% | 0.00% |
| Neurological Complication | 0.00% | 0.00% |

Patients characteristics in terms of age and weight were comparable in both the groups (P>0.05). [Table 1] There was no statistically significant difference in mean time for onset, peak of sensory block in two groups. But 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<0.0001). There was no statistically significant difference in onset of motor block in two groups. But there was statistically significant difference in regression of motor block. There was delayed regression of motor block in group B as compared to group A.[Table 2,3]

The changes observed in heart rate were comparable in both the groups throughout the study period. Heart rate remained stable and comparable at different time points in two groups. Except three patients in group A and one patient in group B, no other patient in either group developed bradycardia. Changes observed in systolic, diastolic and mean blood pressure were comparable in both the groups at different time points (P>0.05). Three patients in Group A and in Group B developed hypotension which responded to intravenous fluid therapy. SpO2 remained stable and comparable in both the groups throughout the study period, (P>0.05).[Table 4,5]

There was no significant difference in sedation score between two groups. Sedation started at 30 minutes of block with maximum sedation score reached between 1.5 - 2 hours in both groups. Sedation score decreased to 0 within 5 hours. At no time, sedation score exceeded 2 and no patient developed signs of respiratory depression. [Table 6]

There was significant prolongation of analgesia in Group B where first rescue analgesic was required after 9 hours of subarachnoid blockade. Patients in Group A required rescue analgesic at 7 hours after subarachnoid blockade. There was statistically significant difference in duration of analgesia in two groups. Postoperative analgesia was significantly prolonged in Group B as compared to Group A. [Table 7]

In Group A, three patients developed bradycardia and three patients developed hypotension where as in Group B, one patient developed bradycardia and three patients developed hypotension. Four patients (8%) in Group A and six patients (12%) in Group B experienced nausea and vomiting, which was statistically not significant. No other complication was noted in either group. [Table 8]

**Statistical Analysis**

After getting the required information, the collected data were coded, tabulated and analysed. The various statistical techniques i.e. the mean, standard deviation and test of significance (t-test and chi-square-test) were used for drawing valid conclusions. Statistical analysis done using student t-test. SPSS 13.0 software was used to calculate p value. P<0.05 was taken as statistically A descriptive analysis was done on all variables to obtain a frequency distribution. The mean + SD and ranges were calculated for quantitative variables. Continuous variables were compared by the Student t test. Proportions were analyzed with the chi-square test

## DISCUSSION

Dexmedetomidine hydrochloride was introduced in clinical practice in the United States in 1999 and approved by the FDA only as a short-term (< 24 hours) sedative for mechanically ventilated adult ICU


ISSN (O): 2687-5365; ISSN (P): 2753-6556

patients. Dexmedetomidine is now being used outside the ICU in variety of clinical settings, including sedation and adjunct analgesia in the operating room, sedation in diagnostic procedures and for other applications such as withdrawal/detoxification amelioration in adult and paediatric patients. Dexmedetomidine is being introduced in Indian market; hence to contribute the literature, we decided to study the efficacy and safety profile of Dexmedetomidine with bupivacaine versus bupivacaine alone in subararachnoid block in patients undergoing lscs.

The clinical studies about the use of intrathecal Dexmedetomidine in surgical patients are limited in the literature. Kanazi et al found that 3 ug Dexmedetomidine is equipotent to 30 µg Clonidine in prolonging duration of sensory and motor block with minimal side effects when added to 15 mg spinal Bupivacaine for urology surgery. From Kanazi's study and animal studies, we assumed that 3 - 5 ug Dexmedetomidine would be equipotent to 30- 45 (microgm Clonidine. Animal studies have used intrathecal Dexmedetomidine at a dose ranged to 2.5 - 100 microgm.[8]

Present study showed that the supplementation of 10 mg of spinal Bupivacaine with 5 µg Dexmedetomidine did not show significant difference in the time for onset and peak of sensory blockade. But addition of 5µg Dexmedetomidine showed significantly prolonged two segment regression (147.04 ± 32.09 min) and total duration of sensory blockade (325.76 ± 38.49 min) as compared to bupivacaine alone where time for two segment regression and total duration of sensory blockade was (120.9 ± 24.61 min) and (264.8 ± 38.87 min). Dexmedetomidine also showed longer postoperative analgesia period of 9 hours as compared to 7 hours in A group. In this study, the addition of 5 µg Dexmedetomidine to intrathecal Bupivacaine also did not show significant difference in time for onset of motor block but showed prolonged duration of motor block when compared with Bupivacaine.

Findings of this study are similar to the findings reported by G. E. Kanazi et al, Rampal Singh et al and Sarma et al where Kanazi et al and Solanki SL et al concluded that there was no significant difference in onset of sensory and motor block. Solanki SL et al also concluded that total duration of sensory and motor block was prolonged with Dexmedetomidine as compared to Clonidine. Sarma et al concluded that addition of Dexmedetomidine to intrathecal Bupivacaine produces longer post operative analgesia than Clonidine. This antinociceptive effect may explain the prolongation of sensory block when added to spinal anaesthetic.[8,9,10]

Sushruth MR et al. has shown that the intrathecal a2 adrenoceptor agonist can cause dose dependent decrease in motor strength in animals and prolongation of motor block of spinal anaesthetics due to addition of a2 agonist may result from their binding to motor neurons in dorsal horn. In this study, addition of Dexmedetomidine did not cause significant fall in blood pressure intraoperatively and postoperatively. Three patients in Dexmedetomidine group and three patients in A 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 a2 agonist to high dose of local anaesthetics does not further affect the near maximal sympatholysis.[11]

Intrathecally administered a2 adrenoceptor agonists have a dose dependent sedative effect. The dose of Dexmedetomidine 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 Sp02. In fact, the sedation produced by Dexmedetomidine 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.

Reddy VS et al did a randomized double-blind study on intravenous dexmedetomidine versus clonidine for prolongation of bupivacaine spinal anesthesia and analgesia. Kim JE etal in a similar study like us studied effects of intrathecal dexmedetomidine on low-dose bupivacaine spinal anesthesia in elderly patients undergoing transurethral prostatectomy. Mahendru V et al did a comparison of intrathecal dexmedetomidine, clonidine, and fentanyl as adjuvants to hyperbaric bupivacaine for lower limb surgery in a double blind controlled study. Whereas Hanoura SE et al studied intraoperative conditions and quality of postoperative analgesia after adding dexmedetomidine to epidural bupivacaine and fentanyl in elective cesarean section using combined spinal-epidural anesthesia. Anesthesia, essays and researches. The results of all above studies are in conjunction with our studies.[12,13,14,15]

Bi YH et al added low dose of dexmedetomidine as an adjuvant to bupivacaine in cesarean surgery and saw that it provides better intraoperative somato-visceral sensory block characteristics and postoperative analgesia. Sixty parturients with the American Society of Anesthesiologists (ASA) physical status I or II were anesthetized with intrathecal bupivacaine(10mg) alone or in combination with dexmedetomidine (3 µg and 5 µg) to undergo cesarean section. The anesthetic parameters, postoperative analgesia and stress responses were monitored. At 6 hour after operation the visual analogue scale (VAS) was smaller in dexmedetomidine (3 µg and 5 µg) co-administration groups. The uterine contraction pain at 6 and 12 hour after operation and supplemental analgesics had no difference across three groups. No difference of side effects (shivering, nausea and vomiting, itching), the first anal aerofluxus time and intraoperation tramadol dose were detected among the three groups. It was concluded that the use of dexmedetomidine


ISSN (O): 2687-5365; ISSN (P): 2753-6556

especially at the dose of 3µg as an adjuvant to bupivacaine in cesarean surgery provides better intraoperative somato-visceral sensory block characteristcs and postoperative analgesia, which produced no influence on Apgar scores, side effects and stress response.[16]

Xia F et al did a a prospective, double-blinded, randomized study in which they calculated the effect of intrathecal dexmedetomidine on the dose requirement of hyperbaric bupivacaine in spinal anaesthesia for caesarean section.The ED95 and 95% confidence intervals (95% CI) of IT hyperbaric bupivacaine of the Dex group and Control group were 8.4 mg (95% CI, 6.5~13.8 mg) and 12.1 mg (95% CI, 8.3~312.8 mg), respectively. The duration of sensory block was longer in the Dex group than in the Control group (110.3 ± 35.3 vs 67.5 ± 26.2). The duration of analgesia was also longer in the Dex group than in the Control group (224.9 ± 45.4 vs 155.1 ± 31.6). The consumption of postoperative rescued sufentanil was significantly higher in the Control group than in the Dex group. So, intrathecal 5 mcg dexmedetomidine potentiated hyperbaric bupivacaine antinociception by 31% in spinal anaesthesia for patients undergoing caesarean section.[17]

Parameswari AR et al did comparison of efficacy of bupivacaine with dexmedetomidine versus bupivacaine alone for transversus abdominis plane block for post-operative analgesia in patients undergoing elective caesarean section. Thirty-five patients were in each study (with dex) and control (without dex) groups. At the end of Caesarean section done under spinal anaesthesia, transversus abdominis plane block was done bilaterally under ultrasound guidance. The P value of this difference was 0.0136 and was found to be statistically significant. The addition of dexmedetomidine to bupivacaine in TAP block prolonged the duration of time at which first dose of rescue analgesia was sought and also reduced the total dose of opioid requirement in the first 24-h post-Caesarean section.[18]

## CONCLUSION

Dexmedetomidine in the dose of 5µg added to 10 mg o.5% Hyperbaric Bupivacaine in subarachnoid block for lower segment cesarian section surgery in partieunts provides comparable onset for sensory and motor blockade but significantly prolonged duration . Longer duration of postoperative analgesia with 5µg Dexmedetomidine with bupivacaine makes it superior to bupivacaine alone in respect to postoperative analgesia. It produces desirable level of intraoperative and postoperative sedation, stable haemodynamics and minimal side effects.

## REFERENCES


1. Roelants F. The use of neuraxial adjuvant drugs (neostigmine, clonidine) in obstetrics. Curr Opin Anaesthesiol. 2006;19(3):233-7. doi: 10.1097/01.aco.0000192812.56161.f8.
2. Klimscha W, Tong C, Eisenach JC. Intrathecal alpha 2-adrenergic agonists stimulate acetylcholine and norepinephrine release from the spinal cord dorsal horn in sheep. An in vivo microdialysis study. Anesthesiology. 1997;87(1):110-6. doi: 10.1097/00000542-199707000-00015.
3. Bajwa S, Kulshrestha A. Dexmedetomidine: an adjuvant making large inroads into clinical practice. Ann Med Health Sci Res. 2013;3(4):475-83. doi: 10.4103/2141-9248.122044.
4. Li Z, Tian M, Zhang CY, Li AZ, Huang AJ, Shi CX, et al. A Randomised Controlled Trial to Evaluate the Effectiveness of Intrathecal Bupivacaine Combined with Different Adjuvants (Fentanyl, Clonidine and Dexmedetomidine) in Caesarean Section. Drug Res (Stuttg). 2015;65(11):581-6. doi: 10.1055/s-0034-1395614.
5. Singh R, Gupta D, Jain A. The effect of addition of intrathecal clonidine to hyperbaric bupivacaine on postoperative pain after lower segment caesarean section: A randomized control trial. Saudi J Anaesth. 2013;7(3):283-90. doi: 10.4103/1658-354X.115360.
6. Magdy H, Mohsen M, Saleh M. The effect of intrathecal compared with intravenous dexmedetomidine as an adjuvant to spinal bupivacaine anesthesia for cesarean section. Ain Shams J. Anesthesiol. 2015;8(1):93.
7. Kamali A, Azadfar R, Pazuki S, Shokrpour M. Comparison of Dexmedetomidine and Fentanyl as an Adjuvant to Lidocaine 5% for Spinal Anesthesia in Women Candidate for Elective Caesarean. Open Access Maced J Med Sci. 2018;6(10):1862-1867. doi: 10.3889/oamjms.2018.365.
8. Kanazi GE, Aouad MT, Jabbour-Khoury SI, Al Jazzar MD, Alameddine MM, Al-Yaman R, Bulbul M, Baraka AS. Effect of low-dose dexmedetomidine or clonidine on the characteristics of bupivacaine spinal block. Acta Anaesthesiol Scand. 2006;50(2):222-7. doi: 10.1111/j.1399-6576.2006.00919.x.
9. Sarma J, Narayana PS, Ganapathi P, Shivakumar MC. A comparative study of intrathecal clonidine and dexmedetomidine on characteristics of bupivacaine spinal block for lower limb surgeries. Anesth Essays Res. 2015;9(2):195-207. doi: 10.4103/0259-1162.153763.
10. Solanki SL, Bharti N, Batra YK, Jain A, Kumar P, Nikhar SA. The analgesic effect of intrathecal dexmedetomidine or clonidine, with bupivacaine, in trauma patients undergoing lower limb surgery: a randomised, double-blind study. Anaesth Intensive Care. 2013;41(1):51-6. doi: 10.1177/0310057X1304100110.
11. Sushruth MR, Rao DG. Effect of adding intrathecal dexmedetomidine as an adjuvant to hyperbaric bupivacaine for elective cesarean section. Anaesthesia, Pain Int Care. 2019:348-54.
12. Reddy VS, Shaik NA, Donthu B, Reddy Sannala VK, Jangam V. Intravenous dexmedetomidine versus clonidine for prolongation of bupivacaine spinal anesthesia and analgesia: A randomized double-blind study. J Anaesthesiol Clin Pharmacol. 2013;29(3):342-7. doi: 10.4103/0970-9185.117101.
13. Kim JE, Kim NY, Lee HS, Kil HK. Effects of intrathecal dexmedetomidine on low-dose bupivacaine spinal anesthesia in elderly patients undergoing transurethral prostatectomy. Biol Pharm Bull. 2013;36(6):959-65. doi: 10.1248/bpb.b12-01067.
14. Mahendru V, Tewari A, Katyal S, Grewal A, Singh MR, Katyal R. A comparison of intrathecal dexmedetomidine, clonidine, and fentanyl as adjuvants to hyperbaric bupivacaine for lower limb surgery: A double blind controlled study. J Anaesthesiol Clin Pharmacol. 2013;29(4):496-502. doi: 10.4103/0970-9185.119151.
15. Hanoura SE, Hassanin R, Singh R. Intraoperative conditions and quality of postoperative analgesia after adding dexmedetomidine to epidural bupivacaine and fentanyl in elective cesarean section using combined spinal-epidural anesthesia. Anesth Essays Res. 2013;7(2):168-72. doi: 10.4103/0259-1162.118947.
16. Bi YH, Cui XG, Zhang RQ, Song CY, Zhang YZ. Low dose of dexmedetomidine as an adjuvant to bupivacaine in cesarean




ISSN (O): 2687-5365; ISSN (P): 2753-6556

surgery provides better intraoperative somato-visceral sensory block characteristics and postoperative analgesia. Oncotarget. 2017;8(38):63587-63595. doi: 10.18632/oncotarget.18864.
17. Xia F, Chang X, Zhang Y, Wang L, Xiao F. The effect of intrathecal dexmedetomidine on the dose requirement of hyperbaric bupivacaine in spinal anaesthesia for caesarean section: a prospective, double-blinded, randomized study. BMC Anesthesiol. 2018;18(1):74. doi: 10.1186/s12871-018-0528-2.
18. Ramya Parameswari A, Udayakumar P. Comparison of Efficacy of Bupivacaine with Dexmedetomidine Versus Bupivacaine Alone for Transversus Abdominis Plane Block for Post-operative Analgesia in Patients Undergoing Elective Caesarean Section. J Obstet Gynaecol India. 2018;68(2):98-103. doi: 10.1007/s13224-017-0990-7.


ISSN (O): 2687-5365; ISSN (P): 2753-6556