A COMPARATIVE STUDY OF INTRATHECAL 0.5% HYPERBARIC BUPIVACAINE AND 0.5% HYPERBARIC BUPIVACAINE WITH DEXMEDETOMIDINE IN ELECTIVE GYNAECOLOGICAL SURGERIES

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ABSTRACT

BACKGROUND

Low doses of dexmedetomidine have shown effectiveness in intensifying spinal anaesthesia. So, dexmedetomidine along with local anaesthetics improves the quality of intraoperative analgesia and also provide postoperative pain relief for longer duration.

AIMS AND OBJECTIVES

To compare the effect of intrathecal 0.5% hyperbaric bupivacaine only and 0.5% hyperbaric bupivacaine with dexmedetomidine in patients undergoing elective gynaecological surgeries.

MATERIALS AND METHODS

100 ASA grade I/II female patients aged between 18-60 years undergoing elective gynaecological surgeries were selected and divided into two groups of 50 each. Group "D" received 0.5% hyperbaric bupivacaine 12.5 mg (2.5 mL) + 0.5 mL normal saline containing 5 µg dexmedetomidine (Total volume 3 mL). Group "B" received 0.5% hyperbaric bupivacaine 12.5 mg + 0.5 mL of normal saline (Total volume 3 mL). The following parameters were checked and compared for both the groups onset of sensory block and motor block, highest level of sensory blockade, duration of analgesia, vitals and side effects.

RESULTS

There was statistically significant variation with regard to the onset of sensory and motor block between the two groups. Majority of group D patients achieved higher sensory levels 52% attained T6 level and in group B 48% attained T8 level. The time for two segment regression was considerably prolonged in group D was 126.7 minutes and in group B was 86.7 minutes. Time to full sensory recovery was 310 minutes in group D and 184 minutes in group B. Time to motor recovery was prolonged in group D with 279.9 minutes compared to group B 163.4 minutes. Duration of complete analgesia in group D was 337.5 minutes and in group B was 190.2 minutes. Effective analgesia in group D was 367.7 mins. and in group B was 207.3 mins. thereby reducing the requirement of analgesics in the early postoperative period. Patient maintained haemodynamic stability and no other side effects.

CONCLUSION

Dexmedetomidine potentiates bupivacaine spinal anaesthesia by improving the quality of intraoperative and postoperative analgesia.

KEYWORDS

Spinal Anaesthesia, Dexmedetomidine, Bupivacaine, Complete and Effective Analgesia.

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INTRODUCTION: The effect of spinal anaesthesia by way of sensory blockade when carried into the postoperative period is very beneficial to the patient. This is attempted by combining the lowest dose of the drugs with longer duration of action and least side effects. In order to extend intraoperative analgesia into postoperative period, a number of spinal adjuvants such as opioids like morphine, buprenorphine and fentanyl, clonidine, ketamine and so on have been added to prolong intrathecal bupivacaine action. There is always a search for alternative drugs, which can bring about this effect of extended analgesia.[1]

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In the present day practice of anaesthesiology, bupivacaine is the most commonly used drug for spinal anaesthesia. To improve upon the quality of analgesia and prolong the duration of its action, many adjuvants have been tried. Intrathecal dexmedetomidine, an α2 adrenoreceptor agonist has potent central antinociceptive properties with analgesic effect at spinal level. Low doses of dexmedetomidine have shown effectiveness in intensifying spinal anaesthesia. So, dexmedetomidine along with local anaesthetics improves the quality of intraoperative analgesia and also provides postoperative pain relief for longer duration. This study was done to evaluate the effects of adding dexmedetomidine to hyperbaric bupivacaine for gynaecological surgeries.

To compare the effect of intrathecal 0.5% hyperbaric bupivacaine only and 0.5% hyperbaric bupivacaine with dexmedetomidine in patients undergoing elective gynaecological surgeries.

MATERIALS AND METHODS: This clinical study was conducted on 100 adult patients of ASA physical status 1 and 2 in the age group of 18 years to 60 years posted for elective gynaecological surgeries under spinal anaesthesia after taking informed consent at Osmania General Hospital and Niloufer Hospital attached to Osmania Medical College, Koti, Hyderabad, over a period of 12 months. After approval from the hospital ethical committee, a comparative study was carried out on 100 adult patients.

Patients were randomly divided on an alternate basis into two groups of 50 each.

Group D (Dexmedetomidine group) patients received intrathecal 0.5% hyperbaric bupivacaine 12.5 mg (2.5 mL) + 0.5 mL normal saline containing 5 µg of dexmedetomidine (Total volume 3 mL).

Group B (Bupivacaine group) received intrathecal 0.5% hyperbaric bupivacaine 12.5 mg (2.5 mL) with normal saline 0.5 mL (Total volume 3 mL).

Inclusion Criteria:

1. ASA grade 1 and 2 female patients.
2. Age group of 18-60 years.
3. Patients giving valid informed consent.
4. Those patients scheduled to undergo elective gynaecological surgeries under subarachnoid block.

Exclusion Criteria:

1. Patient refusal.
2. Patients belonging to ASA grade 3 and grade 4.
3. Patients physically dependent on narcotics.
4. Patients with history of drug allergy.
5. Patients with gross spinal abnormality, localised skin sepsis, haemorrhagic diathesis or neurological involvement/diseases.
6. Head injury cases.
7. Patients with cardiac, pulmonary, hepatic or renal disorders.
8. Patients with peripheral neuropathy.
9. Patients having inadequate subarachnoid blockade and who were later supplemented by general anaesthesia.

METHOD OF STUDY: Preanaesthetic checkup was carried out preoperatively with a detailed history, general physical examination and systemic examination. Airway assessment and spinal column examination were done.

The following laboratory examinations were done in all the subjects in study - Haemoglobin, Urine analysis, Blood sugar, Blood urea, Serum creatinine, Coagulation profile, Blood grouping and Rh typing, ECG-for patients over 40 years of age and chest x-ray.

Preoperatively:

- Patient's informed consent was taken.
- Nil per oral status was confirmed.
- The procedure of subarachnoid block was explained and the patient was informed to communicate to the anaesthesiologists about perception of any pain or discomfort during the surgery.
- They were premedicated with tablet diazepam 10 mg and tablet ranitidine 150 mg orally 10:00 pm at night before surgery and at 7:00 am on the morning of surgery.

Procedure: Patient was shifted to the OT table; IV access was obtained on the forearm with 18 gauge IV cannula and lactated Ringer's solution 500 mL was infused intravenously before the block. The monitors connected to the patient included non-invasive BP, oxygen saturation using pulse oximeter. Baseline PR, BP and RR, SpO2 were recorded.

Under strict aseptic precautions, lumbar puncture was performed in left lateral position or sitting position by midline approach by using disposable Quincke spinal needle (23G) at L3-L4 intervertebral space. Patients were monitored continuously using noninvasive blood pressure, pulse oximeter and electrocardiogram. After spinal anaesthesia, oxygen (4 L/mins.) by facemask was given. Fluid therapy was maintained with lactated Ringer's solution (10 mL/kg/hr).

The following Parameters were Observed and Recorded:

Vital Parameters: HR, BP and RR, SpO2 monitored at 1, 3, 5, 10, 15, 20, 25, 30, 45, 60, 120, 180 minutes.

Assessment of Sensory Blockade: The onset of sensory block was tested by pinprick method using a hypodermic needle. The time of onset was taken from the time of injection of drug into subarachnoid space to loss of pinprick sensation. The highest level of sensory block and time required to achieve it was noted. The time for regression of sensory level in two dermatomal segments was noted. The duration of sensory blockade was taken as time from onset to time of return of pinprick sensation to S1 (heel) dermatomal area.

Assessment of Motor Blockade: This was assessed by Modified Bromage scale.[2]

The time interval between injections of drug into subarachnoid space to the patient's inability to lift the straight extended leg was taken as onset time (Bromage 3). The duration of motor block was taken from time of injection to complete regression of motor block (the ability to lift the extended leg - Bromage 0).

Modified Bromage Scale:

- Grade 0 - Full flexion of knees and feet.
- Grade 1 - Just able to flex knees, full flexion of feet.
- Grade 2 - Unable to flex knees, but some flexion of feet possible.
- Grade 3 - Unable to move legs or feet.

Assessment of Analgesia: Pain was assessed by Visual Analogue Score (VAS). It was first advocated by Revill and Robinson[3] in 1976. VAS consists of a 10 cm line having at one end a label such as "No pain" and at the other end a label such as the "Worst Pain". The patient simply marks the line to indicate the pain intensity and the provider then measures the length of the line to mark a point scale. All the patients were instructed about the VAS and to point out the intensity of pain on the scale 0 - No pain, 10 - Worst pain.

Visual Analogue Scale (VAS): Duration of complete analgesia was defined as the time from the intrathecal injection to VAS >0 to <4 and duration of effective analgesia as the time to VAS >4. Analgesics were avoided until demanded by the patient and the time taken for the first pain medication was also noted (i.e., when VAS >6). VAS was also recorded 3, 6 and 12 hours, postoperatively.[4]

Quality of Intraoperative Analgesia: It was assessed on a four-point modified Belzarena scale.[5]

1. Unable to tolerate pain.
2. Able to tolerate discomfort with additional analgesia.
3. Some discomfort, but no additional analgesics required.
4. Completely satisfied.

Sedation scores were assessed every 15 minutes both intra and postoperatively using a four-point score described by Sethi et al.[6]

- Grade 0 - Patient wide awake.
- Grade 1 - Patient is sleeping comfortably, but responding to verbal commands.
- Grade 2 - Deep sleep, but arousable.
- Grade 3 - Deep sleep, unarousable.

Postoperatively, monitoring of vital signs, VAS scores and sedation scores was continued every 30 minutes until the time of regression of sensory block to L1 dermatome. The incidence of hypotension (arterial blood pressure <20% of baseline) was treated with Inj. Mephentermine 6 mg intravenous increments and bradycardia as pulse rate <60/mins. was treated by atropine 0.6 mg intravenous stat. Side effects like sedation, nausea, vomiting, urinary retention were monitored in the recovery room and then shifted to the ward. Neurological examination was done to rule out any neurological deficits at discharge.

STATISTICAL ANALYSIS: The demographic data were analysed using either Student's t-test or chi-square test. Quantitative data was analysed by student's t-test and qualitative data was analysed by chi-square test. All values were expressed as mean±standard deviation. P <0.05 was considered statistically significant.

RESULTS: A total of 100 female patients belonging to ASA grade I and II posted for gynaecological surgeries undergoing with spinal surgeries were randomly selected. The patients were divided into 2 groups of 50 each.

	Group D	Group B	t-test	P Value
Age in Years	38.6±10.6	36.2±12.2	1.03	0.31, NS
Height in Feet	5.42±0.31	5.50±0.32	1.21	0.23 NS
Weight in kilograms	55.5±7.0	57.3±8.2	1.21	0.23, NS

Table 1: Patient Demographics

The mean age of patient in group D was 38.6±10.6 and in group B was 36.2±12.2 years. The t test value was 1.03 and p value was 0.31, which was not significant.

The mean height of patient in group D was 5.42±0.3 and in group B 5.5±0.32 (feet). The t test value was 1.21 and p value was 0.23, which was not significant.

The mean weight of patient in group D was 55.5±7.0 and in group B was 57.3±8.2 kg. The t test value was 1.21 and p value was 0.23, which was not significant.

	Group D	Group B	t- test	P Value
Sensory block (sec.)	128.7±13.7	206.0±18.1	24.08	<0.001 HS
Motor block (sec.)	227.4±30.3	323.0±26.2	16.07	<0.001 HS

Table 2: Onset of Sensory and Motor Block

Values are expressed as Mean±SD. HS: Highly significant Student's unpaired 't' test.

The onset of sensory block in groups D was faster compared to group B and highly significant with P value <0.001.

There was statistically significant difference with regard to onset of motor block between the two groups.

	Group D n (%)	Group B n (%)
T4	2 (4)	2 (4)
T6	26 (52)	14 (28)
T8	21 (42)	24 (48)
T10	1 (2)	10 (20)
Total	**50**	**50**

Table 3: Highest Level of Sensory Block

Chi-square = 13.03, p <0.05 significant.

With regard to highest sensory level attained, patient of group D, 52% attained T6 level, 42% achieved T8 level, 4% from both groups achieved T4 and 2% attained T10 level.

In group B, 48% achieved T8 level, 28% achieved T6 level, 20% achieved T10 level and 4% achieved T4 level.

This implied group D achieved higher sensory level block with p<0.05, which is significant.

Recovery parameters (mins.)	Group D	Group B	t	P Value
Time to 2 segment regression	126.7±7.25	86.7±9.5	23.63	<0.001, HS
Time to complete sensory recovery	310.9±20.0	184.4±13.6	37.03	<0.001, HS
Time to complete motor recovery	279.9±19.6	163.4±14.4	33.91	<0.001, HS

Table 4: Recovery Parameters

Values are expressed as Mean±SD. NS: Not significant, HS: Highly significant.

The time of two segment regression was considerably slower in group D with 126.7±7.25 mins. compared to group B, which was 86.7±9.5 mins. The difference was statistically significant (P <0.001).

The mean duration of sensory block (time for complete sensory recovery) in group D was 310±20 and in group B was 184.4±13.

The mean duration of motor recovery in group D was 279.9±19.6 mins. and in group B was 163.4±14.4 mins. There was statistically significant difference in duration of motor and sensory recovery (P<0.001).

Duration of Analgesia: The mean duration of complete analgesia, expressed as the mean, (without need of analgesics) in group D was 337.5±24.8 mins. and in group B was 190.2±11.5, which was statistically significant (p<0.001).

The mean duration of effective analgesia, expressed as the mean, (first pain medication) in group D was 367.7±26.6 and in group B was 207.3±15.3, which was statistically significant (p <0.001). The differences between either group is highly significant.

Quality of Intraoperative Analgesia: With regard to quality of intraoperative analgesia, 72% of patients in group D were completely satisfied when compared to 66% in group B. Some discomfort was complained by 26% of patients in group D compared to 34% in group B, but no additional analgesics were given to patients. (Chi-square = 1.66, p=0.44, NS). Intraoperatively, quality of analgesia in both groups was not significant.

Intraoperative and Postoperative VAS Score: With regard to intraoperative VAS score; group D with VAS score of 0.02±0.14 and 0.16±0.37 in group B, which was statistically significant (p<0.05).

With regard to postoperative VAS scores; VAS at end of 3 hours in group D was 0.04 and 0.96, respectively; in group D and group B, VAS at the end of six hours was 3.38 and 4.74, respectively; in group D and group B, VAS at the end of twelve hours was 6.24 and 6.80, respectively; in group D and group B, VAS were statistically significant at 3, 6 and 12 hours implying patients in group D had better pain relief (lower VAS) in the postoperative period than in group B.

Heart Rate at Various Time Intervals: The two groups differ significantly with respect to heart rate at an interval of 15, 20, 30 minutes. With group D patients having mean heart rate of 68.1, 67.9, 71.6 at 15, 20, 30 minutes, respectively and in group B mean heart rate was 72, 74, 74 at 15, 20, 30 minutes, respectively, which was statistically significant (p<0.05). At 0 minutes, 5, 10 and at 120 minutes, the mean heart rate was 79.3, 76.1, 71.9 and 75.7 in group D and it was 80.2, 77.8, 74.2 and 76.6 in group B and the values at these intervals were statistically insignificant.

Time Interval in (mins.)	Systolic blood pressure				Diastolic blood pressure			
	Group D	Group B	t	P Value	Group D	Group B	T	P Value
0	129.8±10.5	130.3±14.3	0.20	0.84, NS	80.7±7.2	78.1±7.1	1.81	0.07, NS
5	121.4±10.8	120.5±13.3	0.39	0.70, NS	74.4±8.8	73.5±7.2	0.60	0.55, NS
10	110.9±10.9	113.4±13.5	1.02	0.31, NS	67.3±8.4	67.7±7.2	0.22	0.83, NS
15	106.8±11.5	110.4±12.9	0.70	0.49, NS	65.2±7.7	67.7±7.4	1.68	0.10, NS
20	107.4±10.3	111.3±10.8	1.86	0.07, NS	65.2±7.3	68.9±6.8	2.63	<0.05, S
30	111.2±9.0	115.7±8.8	2.50	<0.05, S	69.8±5.3	71.9±5.6	1.92	0.06, NS
120	119.9±8.4	120.9±8.0	0.61	0.54, NS	75.6±4.9	74.7±6.1	0.78	0.44, NS

Table 5: Systolic and Diastolic Blood Pressure (in mmHg)

NS: Not significant, S: Significant. Time Interval in Minutes.

The changes in systolic and diastolic blood pressure at any interval are statistically and clinically insignificant.

Adverse Effects: In group D, 10% patient experienced hypotension, 6% had bradycardia, 4% had nausea/vomiting and shivering when compared to group B in which 12% had hypotension, 8% had bradycardia, nausea, vomiting and shivering. There was no respiratory depression in both the groups.

DISCUSSION

Demographic Profile across the Group: In our study, majority of patients were middle aged in both the groups. The mean height and the mean weight in either group were also identical. The types of surgeries performed were also identical in both the groups. These parameters were kept identical in both the groups to avoid variations in intraoperative and postoperative outcome of patients.

Onset of Sensory and Motor Blockade: There was statistically significant difference with regards to onset of sensory and motor block between the groups with faster onset in group D (sensory and motor block 128 and 227 seconds, respectively) as compared to group B (206 and 227 seconds, respectively). Similar findings were reported by Al-Mustafa et al[7] where they found earlier sensory and motor blockade in dexmedetomidine group. Abdelhamid et al[8] also found similar results in their double-blinded randomised controlled study conducted in 62 patients.

Shukla et al[9] compared dexmedetomidine and magnesium sulphate groups and reported faster sensory and motor block with intrathecal dexmedetomidine over magnesium sulphate. Our results correlate with the above-mentioned studies. Hence, we concluded that addition of dexmedetomidine has faster onset of sensory and motor blockade.

Highest Sensory Level Blockade: With regard to the highest sensory level attained, group D achieved higher sensory level block with $p<0.05$, which is significant.

Gupta et al[10] conducted a study on 60 patients to evaluate the effect between dexmedetomidine and fentanyl as intrathecal adjuvant to bupivacaine. In their study, they concluded that dexmedetomidine group patients had higher sensory level of T5 compared to T8 in control group. This compares well with our findings.

From the above results, we conclude that addition of dexmedetomidine intrathecally to hyperbaric bupivacaine results in higher level of sensory blockade and faster onset when compared to bupivacaine only.

Time for Two Segment Regression: The time for 2 segment regression was considerably prolonged in group D with 126.7±7.2 minutes and in group B, it was 86.7±9.5 minutes.

Abdelhamid et al[8] in their study observed the mean time to two segment regression as 120.3±13.8 minutes in D group compared to control group (P group) where it was 92.3±9.9 minutes, which was very much comparable with our study result. They concluded that time to two segment regression was significantly prolonged in dexmedetomidine group.

Hala et al[11] conducted a prospective, double-blinded study with different doses of dexmedetomidine 10 µg and 15 µg with hyperbaric bupivacaine in spinal anaesthesia. In their study, they concluded that the time for two segment regression was significantly prolonged in dexmedetomidine group when compared to the control group.

Kanazi et al[12] conducted a prospective double-blind study in 60 patients with low-dose dexmedetomidine or clonidine with bupivacaine spinal block. They concluded that the time to two segment sensory regression was significantly prolonged in the dexmedetomidine (D) group as compared to the control group (B).

Gupta et al[10] in their study concluded that block regression was significantly slower with dexmedetomidine group and so time to two segment regression was significantly prolonged.

Results from our study correlate with the above-mentioned studies.

Time for Complete Sensory and Motor Recovery: In our study, the time for complete sensory recovery in group D was prolonged by about 30-38 minutes (group D 310.9 minutes, group B 184.4 minutes). The duration of motor block in group D was prolonged by about 20-25 minutes (group D 279.9 minutes, group B 163.4 minutes). The difference was statistically significant [($p <0.001$), Student's unpaired 't' test].

Hence, the duration of both sensory and motor blockade was significantly prolonged.

Al-Mustafa et al[7] in their study concluded that sensory recovery in group D was 277 mins. and group B was 165 mins. The motor blockade in group D was 246 mins. and group B was 140 mins. They concluded that group D patients had a significantly prolonged motor and sensory blockade.

Kanazi et al[12] in their study, they concluded that sensory recovery time in group D patient was 303±75 mins. and 190±48 in group B. The motor recovery time in group D was 250±76 mins. and 163±47 mins. in group B showed significantly prolonged motor and sensory blockade in dexmedetomidine group.

Hala et al[11] in their study found that sensory recovery time in group D was 320 mins. and 238 mins. in group B. The motor recovery time in group D was 280 mins. and in group B it was 202 mins.

Singh et al[13] carried out a prospective randomised single blind trial in 90 patients to evaluate effect of intrathecal dexmedetomidine (D group) and clonidine (C group). They compared results with control group B (plain bupivacaine). They showed duration of sensory blockade was 404 mins. group D and 210 group B. The duration of motor blockade 309 mins. and 172 mins. group B. They concluded that intrathecal dexmedetomidine significantly prolongs motor and sensory blockade.

The prolongation of sensory and motor blockade in our study was comparable with the above studies.

So, we concluded intrathecal dexmedetomidine 5 µg along with bupivacaine significantly prolongs sensory and motor blockade.

Duration of Analgesia:

Analgesia: We found that the duration of complete analgesia (time from injection of bupivacaine intrathecally to first complaint of pain) and effective analgesia (time to first rescue analgesia) were more in group D as compared to group B thereby reducing the requirement of analgesics in the early postoperative period. The quality of analgesia was better as the VAS was lower in group D than in group B.

Abdelhamid et al[8] demonstrated that the time for first rescue analgesia was 380±16 mins. in group D and 259±14 in group (P), which concluded that significant prolongation of analgesia is seen in group D.

Gupta et al[10] also found in their study that the time for first rescue analgesia was significantly prolonged in dexmedetomidine group (D).

Tarbeeh et al[14] did randomised controlled study in 60 patients to evaluate effect of intrathecal bupivacaine fentanyl versus bupivacaine dexmedetomidine. They concluded that the need for first rescue analgesia was significantly prolonged in dexmedetomidine group (450 mins.) compared to fentanyl group (250 mins.).

Hence, we concluded that duration of complete analgesia and effective analgesia was significantly prolonged with intrathecal administration of dexmedetomidine.

Postoperative Analgesia: In our study, there was significant reduction in the VAS scores of the patients receiving dexmedetomidine as compared with higher VAS scores in patients receiving bupivacaine alone in the first twelve hours postoperatively. This implies better quality of analgesia postoperatively and reduced need of analgesics with the use of intrathecal dexmedetomidine.

Gehan et al also observed that the VAS score was lower in dexmedetomidine group in first 3 hour of postoperative period compared to control group and was statistically significant.

Hence, our results are comparable to the above studies. Hence, we infer that addition of dexmedetomidine to bupivacaine intrathecally results in significantly prolonged duration of complete analgesia, effective analgesia and the time to first pain medication is longer with improved quality of analgesia and reduced requirements of analgesics postoperatively.

Vital Parameters:

Haemodynamics - Heart Rate: In our study, the two groups had variation in heart rate with group D patient having lower mean heart rate compared to group B.

These changes were statistically significant at 15, 20, 30 minutes, but clinically insignificant.

Abdelhamid et al[8] in their study showed that difference in heart rate was statistically significant at 10, 15, 20, 30 mins., but clinically insignificant.

Kanazi et al[12] in their study concluded that heart rate was comparable between the dexmedetomidine group and control group.

Singh et al[13] in their study showed difference in heart rate was statistically significant at 10, 15, 20, 25, 30 mins., but was clinically insignificant in both groups.

Our results were similar to above studies; hence, we infer that addition of dexmedetomidine to bupivacaine is comparable in both groups with respect to heart rate.

Blood Pressure: In our study, the changes in mean systolic blood pressure were statistically insignificant at any time interval except at 30 mins. and it was clinically insignificant.

Whereas, changes in mean diastolic blood pressure were also statistically insignificant at any interval of time except at 20 mins. and it was clinically insignificant.

Our results with respect to changes in mean systolic and diastolic blood pressure are comparable with studies of Abdelhamid et al,[8] Kanazi et al[12] and Singh et al.[13]

Hence, we conclude that cardiovascular profile in our patients was found to be remarkably stable throughout the intraoperative and postoperative period in both the groups.

Side Effects: In our study, 10% patients in group D had hypotension as compared to 12% in group B, 6% patient had bradycardia in group D comparable to 8% in group B, 4% patient had nausea/vomiting in group D compared to 8% in group B and 2% had shivering in group D and 4% in group B.

Hypotension and bradycardia was successfully treated with Inj. Ephedrine (3-6 mg) or Inj. Mephentermine (3-6 mg) and Inj. Atropine 0.6 mg, respectively.

Respiratory rate was monitored in both the groups and there was no evidence of respiratory depression in either group.

Abdelhamid et al[8] in their study concluded that small dose intrathecal dexmedetomidine causes minimal side effects and prolonged postoperative analgesia.

Al-Mustafa et al[7] concluded that addition of dexmedetomidine to intrathecal bupivacaine can be safe and effective to prolong postoperative analgesia.

Many studies are being conducted with bupivacaine for prolonging the postoperative analgesia. The aim of these studies has been to optimise the dose of intrathecal dexmedetomidine for prolonging the duration of postoperative analgesia with minimal side effects.

CONCLUSIONS: On the basis of the present clinical comparative study, we can conclude that the addition of 0.5 mL normal saline containing 5 µg dexmedetomidine to 0.5% hyperbaric bupivacaine 12.5 mg (2.5 mL) in spinal anaesthesia significantly decreases the onset time, prolongs the duration of both sensory and motor blockade. It also prolongs the duration and improves the quality of

postoperative analgesia with better haemodynamic stability as compared to bupivacaine alone.

It is a better substitute for opioids for prolonging spinal anaesthesia. We recommend its use to potentiate bupivacaine spinal anaesthesia.

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