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Comparative study of intrathecal isobaric levobupivacaine (0.5%) 3ml with dexmedetomidine 0.5ml (5 mcg) and isobaric levobupivacaine (0.5%) 3ml with fentanyl 0.5ml (25 mcg) in patients undergoing surgeries under subarachnoid block: a prospective randomized double - blind study"

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KEYWORDS
Isobaric Levobupivacaine, Dexmedetomidine, Fentanyl, Subarachnoid block.

ABSTRACT
Spinal Anesthesia is the preferred choice for lower limb surgeries due to the benefits of an awake patient, low drug costs, effective intraoperative and excellent postoperative analgesia, and quick patient recovery. Adjuvant must be added intrathecally with low-dose local anesthetics to improve the duration of blockade.

Methodology: A prospective randomized, double-masked study with 60 patients (30 in each group, assigned by computer-generated randomization code). **Group A** ~ (n = 30) Patients will receive 3 ml of Isobaric Levobupivacaine 0.5% + Dexmedetomidine 5 mcg (0.5ml) – diluted with NS. **Group B** ~ (n = 30) Patients will receive 3 ml of Isobaric Levobupivacaine 0.5% +Fentanyl 25 mcg (0.5ml)

Results: The mean time for the highest sensory block among Group A (7.17 ± 5.26) mins and among Group B (5.90 ± 3.52) mins, which did not show statistical significance between both the groups (p-value> 0.05). The mean time for regression of sensory block level up to T 10 among Group A cases was (183.60 ± 56.71) mins and among Group B cases (171.17 ± 53.01) mins, which was found to be statistically insignificant (p-value> 0.05).

The mean time of onset of a motor block of Group A (2.35 ± 1.40) & Group B (2.53 ± 1.69) mins was found to be statistically significant between both the groups (p-value < 0.05). It was found that Group A had the fastest time of onset of motor block (Modified Bromage 2) than Group B. The duration of motor blockade in Group A (296.30 ± 75.5) mins and Group B (267.35 ± 23.78) mins was found to be statistically significant between the two groups. (p-value < 0.05), It was found that Group A had the fastest time of onset of motor block (Modified Bromage 2) than Group B. The mean time for first rescue analgesia was significant between the two groups. The time for first rescue analgesia was significantly longer in

Group A (6.93 ± 1.47 hours) and Group B (4.78 ± 2.71 hours).

Conclusion:
The addition of Dexmedetomidine to Isobaric levobupivacaine significantly prolongs the duration of analgesia and anesthesia when compared with fentanyl as an adjuvant to Isobaric levobupivacaine. Levobupivacaine, when administered along with Fentanyl, is a suitable drug for daycare surgeries, while levobupivacaine with dexmedetomidine is an excellent agent for

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longer-duration surgeries. Dexmedetomidine appears to be an appealing adjuvant to intrathecal local anesthetics compared to opioids.

INTRODUCTION

Spinal anesthesia is a simple and safe technique and has been used for surgical procedures involving the lower abdomen, pelvis, perineal, and lower extremities for centuries. The advantages of neuraxial blockade are:

- Its reduced risk of respiratory complications.
- Quick restoration of bowel habits.
- Reduced incidence of coagulation disorders following surgery with early mobility.
- Reduced postoperative stay.

Following the adverse effects of cocaine, several other local anesthetics were used, like lidocaine, bupivacaine, tetracaine, and chloroprocaine.

An all-new local anesthetic (LA) known as levobupivacaine has been approved for administration by means of spinal anesthesia in recent years. Its enantiomer S (-) of bupivacaine is called levobupivacaine. Levobupivacaine has a high potency, with a prolonged duration of action, and a lower tendency to block the sodium and potassium channels in the heart, making it dissociate more quickly than bupivacaine. Due to its rapid protein binding capacity, it reduces cardiovascular side effects and has stable hemodynamics.

Its greater affinity towards sensory fibers compared to motor fibers makes it less cardiotoxic and a profound period of analgesia. However, its motor blockade is considered equal to bupivacaine. Broad uses, such as the more extended blockade of sensory dermatomes and shorter blockade on the motor system, have negligible chances of Hypotension, making it preferred for surgical procedures.

When used on their own, intrathecal local anesthetics (LA) are insufficient to provide satisfactory pain relief post-surgery. Increased LA may also cause changes in hemodynamics, leading to adverse events. Many additives have been tried with LA through spinal anesthesia to increase the potency and decrease the side effects.

Dexmedetomidine, a highly selective 2-agonist, is currently being evaluated as a neuraxial additive of choice due to its ability to create stable hemodynamic conditions, as well as provide good eminence in intra-surgical as well as post-surgical Spinal pain relief with low adverse reactions.

Fentanyl is used as an adjuvant to subarachnoid block and has been proven to improve the quality of spinal blockade and also provide better postoperative analgesia. It is a preferential mu receptor agonist and can bind to delta and kappa but with lower affinity. It is highly lipid soluble, allowing easy penetration into the central nervous system. It produces supraspinal analgesia and respiratory depression through mu receptors and sedation and spinal analgesia through k receptor agonism.

AIMS & OBJECTIVES

AIMS

To compare the efficacy of Isobaric Levobupivacaine (0.5%) 3ml with Dexmedetomidine 0.5 ml (5 mcg) and Isobaric Levobupivacaine (0.5%) 3ml with Fentanyl 0.5 ml (25 mcg) in patients undergoing surgeries under spinal anesthesia.

OBJECTIVES PRIMARY OBJECTIVE

- To compare the onset and duration of sensory and motor blockade between two groups.

SECONDARY OBJECTIVE

- To compare the hemodynamics between both groups.
- To evaluate the time for first rescue analgesia
- Adverse effects, if any.

MATERIALS AND METHODS

STUDY METHODOLOGY:

On acceptance by the Institutional Human Ethics Committee and the submitting consent, subjects

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undergoing surgery were allowed to proceed with the procedure under subarachnoid block in Chettinad Hospital and Research Institute, Kelambakkam, Chennai. In this study, patients who met the selection criteria were included. They had received 3 millilitres of Inj. Levo bupivacaine 0.5%, Isobaric + Inj. Dexmedetomidine 0.5 milliliters (5 mcg) in Group A (n = 30) – diluted with NS or 3 milliliters of Inj. Levo bupivacaine 0.5%,Isobaric + Inj. Fentanyl 0.5 millilitre (25 mcg) in Group B (n = 30).

As part of the pre-anesthetic assessment clinic, all patients were exposed to a routine preoperative evaluation. All patients will be advised to stay nil per oral, a solid diet for 8 hours before surgery, and precise oral fluids for 4 hours before surgery. They have explained the advantages & disadvantages of Spinal Anesthesia.

All the patients will receive Tab: ranitidine 150mg HS at 6 AM of surgery. A room near OT was assigned to the patient before surgery on the day of surgery. Access to an 18G size IV cannula will be secured. All patients will be preloaded with 10-15 milliliters per kilogram of RL 15 minutes before surgery. Standard monitoring systems, including SP02, continuous ECG, and NIBP monitoring, were established before the procedure, and baseline variables were recorded.

Sitting position was recommended for all patients included in this study. Under aseptic precautions, L3L4 IVDS was injected with 2ml of two % Inj. LA. A non-participating anesthesiologist prepared the study drug. Using a spinal needle of 26 or 27 gauge, the subarachnoid space was entered at the level of L3/L4 IVDS. By observing free continuous flow in CSF, the anesthesiologist determined that needle placement was correct and injected 3.5 ml of the study drug.

Patients were made to lie flat after injecting, and this was recorded as “ZERO.” The inception of sensory-motor inhibition was examined at baseline (ZERO) and 3-minute intervals up to 15 min, and after that, 5-minute intervals up to 30 minutes.

The degree of sensory inhibition was determined by the loss of pinprick impression. Dermatomes from S1, L3, T12, T10, T8, T6 or Higher T4 were examined bilaterally. C5-C6 was used as the baseline to determine normal sensation. An indication of sensory onset was the loss of sensation on a 23G needle inserted at the T10 level. The test was performed every 3 minutes till 15 minutes and thereafter every 5 minutes up to 30 minutes. As defined, the length of the sensory inhibition was computed from injecting the drug to sensoryinhibitions's complete resolution. The ultimate sensory limit and its duration to attain the highest sensory level were noted.

Bilateral motor inhibition was examined using a modified Bromage scale. The initiation in motorfunction after administration of the drug has been deemed to be the achievement of modified Bromage score 2 and was considered a complete improvement when the modified Bromage score reached grade 4.

FIGURE 1: MODIFIED BROMAGE SCALE

GRADE	CRITERIA	DEGREE OF BLOCK
I	Free movement of legs and feet.	Nil (0%)
II	Knee flexion decrease but full flexion of feet and ankle	Partial (33%)
III	Unable to flex knees, flexion of ankle and feet present	Partial (66%)
IV	Unable to flex knee or ankle or move toes	Complete paralysis (100%)

Hemodynamic parameters and adverse effects:

The patient’s HR, NIBP, and SPO2 were monitored at 3-minute intervals up to 15 minutes. After that, every 5 mins up to 60 mins after that, every 10 mins until the end of the procedure.

Hypotension or low blood pressure: A decrease in SBP < 90 mmHg or > 30 mmHg from baseline was considered Hypotension. 6mg of IV Ephedrine was administered if needed.

Bradycardia or low heart rate: If the heart rate (HR) was less than 50 beats per minute, Bradycardia was considered and 0.3 milligram IV atropine was administered.

Respiratory Distress: Depression in respiration was said to be the rate of respiration < 8 breaths per minute and SPO2 < 90%.

Sooner the subject had pain and VAS ≥ 3, the first rescue analgesia request was noted down. In case of pain,the rescue analgesia is Inj. Tramadol 50mg was given intravenously, and Inj. Ondansetron 4mg in cases experiencing nausea and vomiting.

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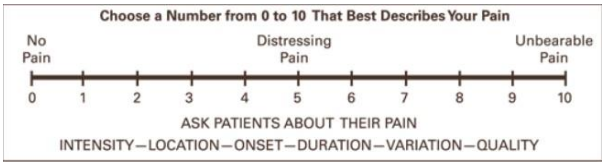
Figure 2: Visual analogue scale [5]



Postoperatively, patients were also monitored for changes in vital parameters, nausea, vomiting, and shivering.

STATISTICAL ANALYSIS

The type of anesthesia was measured as an important parameter. The main aim of the research includes initiation, period of motor, and sensory block. Secondary outcomes include vitals parameters, time for the first call for pain relief medication, and any other ill effects.

Descriptive analysis: It was conceded out by mean and SD for measurable parameters for qualitative data.

Data was signified by way of suitable bar and pie diagrams.

All numerical parameters were assessed for normality through Q-Q plots—& Shapiro Wilk test.

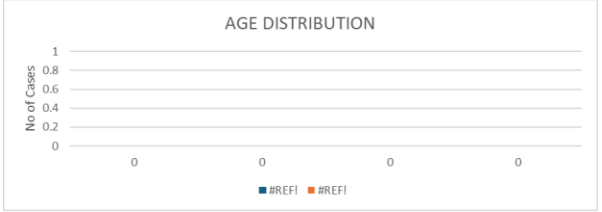
A paired t-test was applied to test the significance of the inter-group comparison.

P value < 0.05 meant statistically significant.

OBSERVATIONS AND RESULTS

The sum of sixty subjects who underwent surgical procedures under subarachnoid block was analyzed with an equal distribution of 30 patients among the A and B groups.**A** of (n = 30) Patients got 3ml of Isobaric Levobupivacaine 0.5% + Dexmedetomidine 5 mcg (0.5ml) – diluted with NS.**B** of (n = 30) Patients got 3ml of Isobaric Levobupivacaine 0.5% +Fentanyl 25 mcg (0.5ml)

FIGURE 3: AGE DISTRIBUTION



Among the total cases, age distribution in Group A, 13 - between 18 – 30 yrs, 5 - between 31 – 40 yrs, 6 each - between 41 – 50 yrs and 51 to 65 yrs.

Similarly the age distribution in Group B, 7 - between 18 – 30 yrs, 6 - between 31 – 40 yrs, 9 - between 41 – 50 yrs and 8 cases were between 51 to 65 years as explained in Figure 3.

FIGURE 4 : GENDER DISTRIBUTION

Group A had 24 male cases and 6 females. In Group B, there were 20 males and 10 female cases as explained in Figure 4.

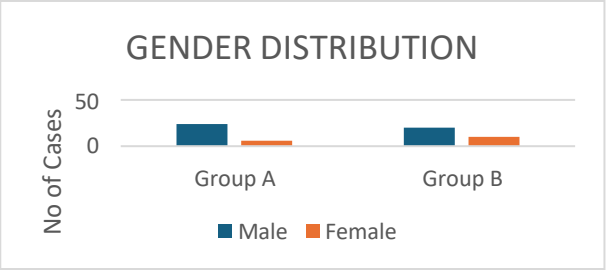
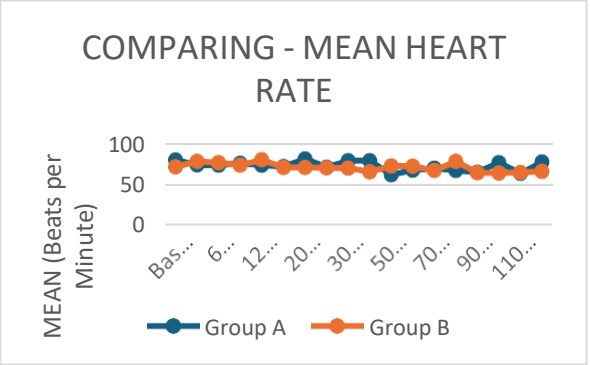


FIGURE 5 : COMPARISON OF MEAN HEART RATE BETWEEN GROUPS



Mean of heartrate at various intervals from baseline, 3 minutes to 120 minutes have been calculated for both the Groups.

The mean heart rate showed statistical significance during 9th minute (p value = 0.026), 12th minute (p value = 0.070), 20th minute (p value = 0.000), 30th minute (pvalue = 0.001), 40th minute (pvalue = 0.000), 50th minute (pvalue = 0.001), 70th minute (pvalue = 0.019), 80th minute (pvalue = 0.000), 100th minute (pvalue = 0.000), 120th minute (pvalue = 0.005) as explained in Figure 5.

FIGURE 6 : MEAN OF SYSTOLIC BLOOD PRESSURE COMPARISON

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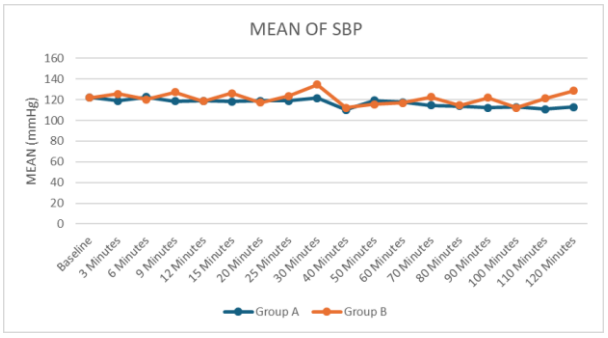
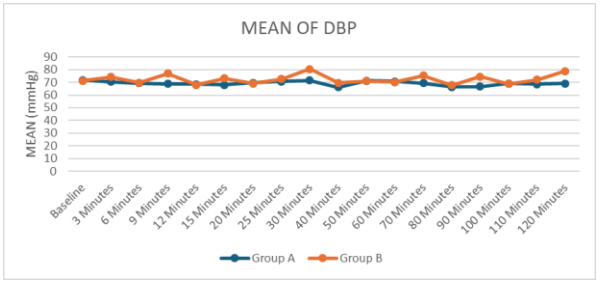


Mean SBP @ various intervals from baseline, 3 minutes to 120 minutes have been calculated for both the Groups. The mean systolic blood pressure showed statistical significance during 6th minute (p value = 0.097), 9th minute (pvalue =0.001), 15th minute (pvalue =0.018), 30th minute (pvalue =0.001), 80th minute (pvalue =0.024), 100th minute (pvalue =0.007), 110th minute (pvalue =0.000) 120th minute (pvalue =0.000) as explained in Figure 6.

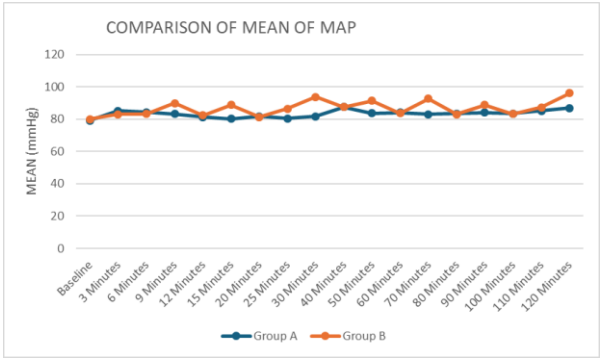
FIGURE7 : MEAN OF DIASTOLIC BLOOD PRRESSURE COMPARISON



Mean of DBP at various intervals from baseline, 3 minutes to 120 minutes have been calculated

The mean diastolic blood pressure showed statistical significance during 9th minute (pvalue =0.001), 15th minute (pvalue =0.032), 30th minute (pvalue =0.002), 40th minute (pvalue =0.030), 90th minute (pvalue = .023), 120th minute (pvalue =0.001) as explained in Fig 7.

FIGURE 8: COMPARISON OF MEAN ARTERIAL BLOOD PRESSURE



Mean of MAP at various time intervals from baseline, 3 minutes to 120 minutes have been calculated .

The mean MAP showed statistical significance during 15th minute (pvalue =0.014), 30th minute (pvalue =0.000), 50th minute (pvalue =0.009), 70th minute (pvalue = .001), 90th Minute (p value = .026) & 120th minute (p value = 0.002) as explained in Figure 8.

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TABLE 1 : SENSORY ONSET COMPARISON (T10)

Parameter	StudyGroup		p Value
	A	B	
Sensory onset (T10)	2.83 ± 1.7	2.72 ± 1.97	.425

Mean sensory onset has been calculated , found statistically insignificant between both the groups. (p value = .425) as explained vide Figure 1.

TABLE 2 : SENSORY BLOCK's PEAK DISTRIBUTION

SENSORY BLOCK's PEAK	A		B	
	Cases	%	Cases	%
T4	18	60.0	15	50.0
T5	5	16.7	5	16.7
T6	6	20.0	8	26.7
T8	1	3.3	1	3.3
T10	0	0.0	1	3.3
SUM	30	100	30	100

Sensory block's peak identified among A , B In Group A, 18 cases had level of T4, 5 cases had level of T5, 6 cases had level of T6 and 1 case had level of T8.Among Group B cases, 15 cases, 5 cases, 8 cases had level T4, T5 and T6 respectively whereas 1 case had level of each T8 and T10 as explained vide Table 2.

TABLE 3: COMPARISON OF TIME FOR HIGHEST SENSORY BLOCK

Parameter	Study Group (Mean ±Standard deviation)		pvalue
	A	B	
Peak Sensory inhibition (Minutes)	7.17 ± 5.26	5.90 ± 3.52	.327

Mean time for highest sensory block has been calculated for both the Groups and was found statistically insignificant between both the groups. (p value = .327) as explained vide Table 3 .

TABLE 4: COMPARISON OF REGRESSION TO SENSORY BLOCK LEVEL (UP TO T10)

Parameter	Study group	p value

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	A	B	
Sensory regression level(up to T10)	183.60 ± 56.71	171.17 ± 53.01	.342

Mean of regression of sensory block (upto T10) has been calculated for both the Groups and was found statistically insignificant between both the groups. (p value = .342) as explained vide Table 4.

TABLE 5: MOTOR BLOCK ONSET - MODIFIED BROMAGE SCORE 2

Parameter	Study group		p value
	A	B	
Motor block onset Modified Bromage 2	2.35 ± 1.4	2.53 ± 1.69	0.016

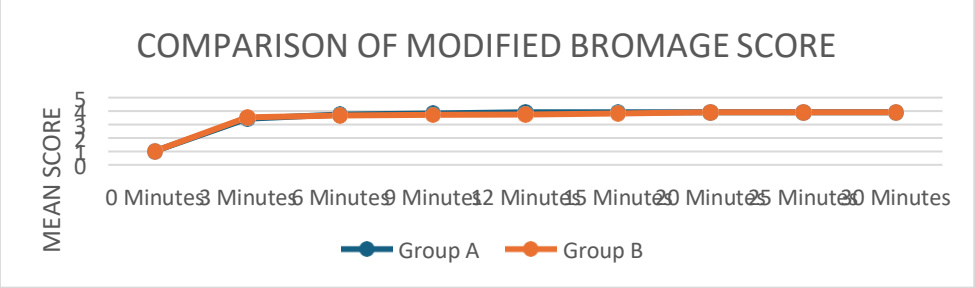
Time for motor block onset has been found significant statistically between both A & B (p value = .016) . It was found that Group A had fastest motor block onset time than Group B as explained in Table 5.

TABLE 6: COMPARISON OF DURATION OF MOTOR BLOCKADE

Parameter	Mean ±Standard deviation		p value
	A	B	
Duration- Motor Blockade	296.30 ± 75.5	267.35 ± 23.78	.000

Motor block duration has been calculated for both found significant statistically between both A , B(p value = .000). It was found that Group A had highest duration of motor block on comparing with Group B as explained vide Table 6.

FIGURE 9: COMPARISON OF MODIFIED BROMAGE SCORE



Mean of modified Bromage score at various time intervals from 0 minutes to 30 minutes have been calculated for both the Groups as explained as figure 9.

FIGURE 10: COMPARISON VISUAL ANALOGUE SCORE

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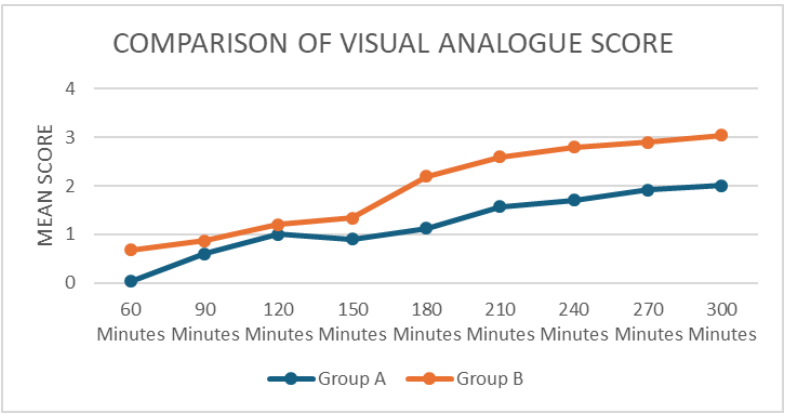

Mean of VAS

60 minutes to 300 minutes have been calculated found significant statistically during 210th minute (p value =0.041) as explained as figure 10

TABLE 7: COMPARISON OF RESCUE ANALGESIA

Rescue Analgesia (In Hours)	A		B		pValue
	Mean	Std. Deviation	Mean	Std. Deviation	
	6.93	1.47	4.78	2.71	0.000

Mean of rescue analgesia , significant statistically. (p value = .000). Rescue analgesia time , A > B , as explained in table 7.

TABLE 8 : SIDE EFFECTS DISTRIBUTION

Side Effects	A		B		P Value
	Cases	Percent	Cases	Percent	
Nausea	0	0.00	0	0.00	-
Vomiting	0	0.0	0	0.0	-
Shivering	6	20.0	2	6.7	.161
Bradycardia	3	10.0	1	3.3	.326
Hypotension	8	26.7	2	6.7	.031

DISCUSSION

Spinal anesthesia provides a secure and reliable approach for surgical anesthesia as well as long-term pain management by reducing the autonomic, somatic, and endocrine reactions. Bupivacaine was the most often prescribed drug, and the enantiomer of it is Levobupivacaine, which was recently introduced in India. They were developed as a superior blocking alternative to racemic bupivacaine with a higher margin of safety.[6]

Clinical investigations in innumerable subjects show bupivacaine is the most effective local anesthetic, and levobupivacaine is similar to bupivacaine. Levobupivacaine has been demonstrated in randomized controlled trials to be effective at producing analgesia and anesthesia when used in lower extremity surgeries. It is equally effective as bupivacaine, and their results were also compared to bupivacaine.[7]

Levobupivacaine is a very strongly recommended local anesthetic because of its rapid onset, prolonged sensory blockade, shorter motor blockade, and low cardiac toxicity. According to earlier studies, combining dexmedetomidine and levobupivacaine produces adequate analgesia, prolongs the duration of motor and sensory blockade, and provides excellent postoperative analgesia with fewer adverse effects.

It has been demonstrated that α2 agonists can elongate the sensory-motor inhibition span taken by local anesthesia, albeit the exact way is uncertain. In the spinal cord's superficial lamina and the pain-related brainstem nucleus, there are α2 adrenoceptors above the primary afferent terminals of neurons. This localization is consistent with the idea that peripheral and central pathways are used by α2 agonists to produce analgesic effects.[8,9]

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One potential adjuvant with a facilitative effect on LA is dexmedetomidine. In numerous research reports in the literature, dexmedetomidine has been used as an additive, preferably to local anesthetic drugs for regional anesthesia. It boosted the block's effectiveness in many subjects while showing no signs of adverse neurological effects.[9]

Fentanyl's quick onset of action, significant affinity for plasma proteins, and potentiation of the afferent sensory blockade make it possible to use with less dose of local anesthetic. Intrathecally administered opioid and local anesthetic mixtures provide synergistic analgesic effects. Fentanyl exerts its impact by triggering a response in the receptor of opioids located in the dorsal horn of the spinal cord.

Fentanyl has been utilized more frequently to deliver segmental analgesia. Because it is more fat soluble and has a stronger affinity for opioid receptors, fentanyl has fewer adverse effects, and it enables faster block onset and better intraoperative and postoperative anesthesia.[10]

The present study has compared the onset and duration of sensory and motor blockade. Additionally, this research aimed to compare the hemodynamics of the two groups and the time for first rescue analgesia, along with the side effects, if any.

Anjali Bhure and colleagues (2018) conducted a study in which they compared the additive to isobaric levobupivacaine, which is intrathecally given with dexmedetomidine and fentanyl. And demonstrated that the average period for the onset of sensory block was 8.25±2.89 minutes in the group that received dexmedetomidine, while the group that received fentanyl experienced it in 2.10±1.15 minutes.[5]

Amar Prakash et al. (2018) equated Levobupivacaine and Levobupivacaine with Dexmedetomidine. They demonstrated that the average duration for initiating sensory inhibition of T10 of Levobupivacaine with the Dexmedetomidine group was 4.90 ± 0.88 mins.[11]However, this did not concur with our study, where Group A had an average duration for the initiation of sensory inhibition of 2.83 ± 1.7min, and B group had 2.72 ± 1.97 mins, which was statistically insignificant.

In their study on the subarachnoid block, Ravi Paul et al. (2021) examined the effects of isobaric levobupivacaine with nalbuphine and dexmedetomidine, both given intrathecally as additives. They showed that the average duration for the initiation of sensory inhibition in the Levobupivacaine with the Dexmedetomidine group was 2.31 ± 0.35 mins.

In our study, Group A had an average duration for the initiation of sensory inhibition of T10 of 2.83 ± 1.7min s.

Anjali Bhure et al. (2018) found the average duration for achieving a peak of sensory inhibition in the dexmedetomidine group was 13.25±3.49 min, while the fentanyl group - was 5.33±1 mins.[5]

Kapil Rastogi et al. (2020) compared dexmedetomidine and fentanyl as an adjuvant to intrathecal levobupivacaine and revealed that the time required to achieve the highest level of sensory block was the shortest in the fentanyl group (3.35 ± 0.36 mins), longer in levobupivacaine alone group (5.56 ± 0.91 mins)

However, this did not occur in our study, where it was 7.17 ± 5.26 mins for the A group and 5.90 ± 3.52 mins for the B Group, which is not significant statistically.

Ravi Paul et al. (2021) found that the average duration for achieving a peak of sensory inhibition in Levobupivacaine with group Dexmedetomidine was 6.63 ± 0.80

In our study, Group A had an average duration for achieving peak sensory inhibition - 7.17 ± 5.26 mins.

Anjali Bhure and colleagues (2018) trial identified that the average initiation of the duration of motor block in group Dexmedetomidine was 9.00±3.24 mins, and in group, Fentanyl was 3.23 ±1.25 mins.[5]

However, it was different in our study, wherein the A group, 2.35 ± 1.4 mins, while in the B Group, 2.53 ± 1.69. Group A had the fastest average initiation duration of motor block (modified bromage score 2) than Group B.

A study by Anjali Bhure and colleagues (2018) demonstrated that the average span of motor block in group Dexmedetomidine was 250.20 ± 6.52 mins and in group Fentanyl, were184.25 ± 11.73 min, stating the significance that the dexmedetomidine group had a much longer motor blockade than fentanyl group.

Ravi Paul and colleagues (2021) demonstrated that the average span of motor block in group Levobupivacaine with Dexmedetomidine was 289.67 ± 5.94 min.[12]

Similarly, in this study, the average duration of a motor blockade in the A group was 296.30 ± 75.5 min, and in the B Group, 267.35 ± 23.78 min. It was statistically significant that the dexmedetomidine group had a much longer motor blockade than the fentanyl group.

In a study by Anjali Bhure et al. (2018), From 2 minutes to 20 minutes during the intraoperative period, there was a significant difference in PR, SBP, DBP, and MAP.]Study done by Amar Prakash (2018) demonstrated that Levobupivacaine with

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Dexmedetomidine group had Hypotension of 10% and Bradycardia of 13%.[11]In a Ravi Paul (2021) study, Levobupivacaine with the Dexmedetomidine group had a Hypotension of 6.67%(12]. Hemodynamics in our present study between A and B showed statistical significance at various slots. HR, SBP, DBP, and MAP showed statistical significance during the time intervals 12th minute, 15th minute, 30th minute, 50th minute, 70th minute, 80th minute, 90th minute, 100th minute, and 120th minute. (p-value being < 0.05)

According to the findings of a study conducted by Anjali Bhure and colleagues (2018), the first analgesia requirement was more in subjects getting Dexmedetomidine than with levo bupivacaine alone and group fentanyl. Additionally, the necessity of 24hrs analgesia was discovered to be less in the Dexmedetomidine group.[11]

This present study had average duration for the first rescue analgesic call was found to be significant between A and B. Average duration for the first rescue analgesiccall was pointedly lengthier in A (6.93 ± 1.47 hours) and Group B (4.78 ± 2.71 hours)

Trial by Anjali Bhure and colleagues (2018), 26 (65%) subjects in group dexmedetomidine had low heart rates, while in group fentanyl 3(7.5%), 31 patients in group fentanyl had an episode of Hypotension.[11]

Kapil Rastogi et al. (2020) mentioned that adverse reactions like Hypotension, nausea, vomiting, and shivering existed with fewer patients among all the groups. However, it did not show a statistical significance.

In a study done by Amar Prakash (2018), Levobupivacaine with the Dexmedetomidine group had Hypotension of 10% and Bradycardia of 13%[11]. In a study done by Ravi Paul (2021), Levobupivacaine with Dexmedetomidine group had Hypotension of 6.67%[12]

In our present study, the occurrence of Hypotension was found in eight subjects (26.7%) of the A group (Dexmedetomidine) and two subjects (6.7%) of the B Group (Fentanyl).

Other side effects were not statistically significant in our current study.

CONCLUSION

As a result, the study determined that the isobaric levobupivacaine, along with Fentanyl dosages employed in trial l, provide sufficient anesthesia and analgesia for surgeries while causing minimal significant adverse effects. Dexmedetomidine causes a considerably more prolonged duration of analgesia than its counterpart in the present study. As a result, drugs should be administered according to the patient's well-being and the duration of surgery. Because of its efficacy, toxicity, and hemodynamic profile, Levobupivacaine, when administered along with Fentanyl, is a suitable drug for daycare and other surgeries with a lower hypotension threshold, whilst levobupivacaine, along with dexmedetomidine, is an excellent agent for longer surgeries.

It seems that dexmedetomidine improves the effectiveness of intrathecal LA with no adverse reactions. Dexmedetomidine is an appealing intravenous adjuvant. It might be an attractive option for long-duration operations conducted under spinal anesthesia.

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