VOLUME - 14, ISSUE - 01, JANUARY - 2025 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Anaesthesiology

A COMPARATIVE STUDY OF LEVOBUPIVACAINE (HYPERBARIC 0.5%) VERSUS LEVOBUPIVACAINE (HYPERBARIC 0.5%) WITH FENTANYL IN INFRAUMBILICAL SURGERIES UNDER SUBARACHNOID BLOCK

Dr. Sonali Khobragade Bhagat	MBBS.MD, Associate Professor, Dept. of Anaesthesiology, Indira Gandhi Government Medical College And Hospital, Nagpur
Dr. Abhiruchi Manikpure	MBBS.MD, Resident, Dept. of Anaesthesiology, Indira Gandhi Government Medical College And Hospital, Nagpur
Dr. Jitendra Bhagat	MBBS.MD, Associate Professor, Dept. of Medicine, Government Medical College And Hospital, Nagpur
Dr. Vaishali Shelgaonkar	MBBS.MD, Professor and Head, Dept. of Anaesthesiology, Indira Gandhi Government Medical College And Hospital, Nagpur

ABSTRACT

Background: Spinal anaesthesia is the most commonly used technique for Infraumbilical surgeries because of easier administration, lesser morbidity, effective postoperative analgesia and better hemodynamic profile intraoperatively. The objective of our study was to compare the efficacy and safety of Levobupivacaine and Levobupivacaine with Fentanyl in subarachnoid block. **Methodology:** The study was conducted in the Department of Anaesthesiology at Indira Gandhi Government Medical College and hospital, Nagpur, Maharashtra. The study was conducted in 110 adult patients admitted in the Department of Surgery and Orthopaedics undergoing Infraumbilical surgeries under subarachnoid block. Assessment of motor blockade was done by Modified Bromage Scale. Degree of pain was assessed by Visual Analogue Scale. Level of sedation was assessed by Five Point Scale. **Result:** There was statistically significant difference between the groups for the onset of sensory and motor blockade, time to achieve maximum sensory blockade, duration of sensory blockade, motor blockade and postoperative analgesia ($p<0.05$). Mean VAS Scores were less in Bupivacaine and Fentanyl group from 120 min to 6 hours ($p<0.05$). **Conclusion:** From the present study, we conclude that Levo-Bupivacaine(hyperbaric, 0.5%) with Fentanyl combination is better than Levobupivacaine plain (hyperbaric, 0.5%) for Sub-arachnoid block in infra-umbilical surgeries, as it provides earlier onset of sensory and motor blockade, earlier time to achieve maximum sensory blockade, prolonged duration of sensory and motor blockade along with prolonged postoperative analgesia with stable vitals and minimal side effects.

KEYWORDS : Levo-Bupivacaine, Fentanyl, Sub- arachnoid Block, Infra-umbilical Surgeries.

INTRODUCTION

Spinal anaesthesia is the most commonly used technique for Infraumbilical surgeries because of easier administration, lesser morbidity, effective postoperative analgesia and better hemodynamic profile intraoperatively .The properties of an anaesthetic agent used for day care surgeries in spinal anaesthesia should have decreased incidence of anaesthesia related complications, should provide adequate post-operative analgesia and allow early patient discharge. Regional anaesthesia has shown to improve the cardio-vascular, pulmonary, gastrointestinal, coagulative, immu-nological and cognitive functions and to be of benefit in an economic context. These improvements are particularly advantageous in caring for elderly and high-risk patient populations undergoing surgery. In addition, regional anaesthesia can facilitate early recovery with excellent post-operative analgesia and few side-effects, which may decrease overall operative costs. Thus, Spinal Anaesthesia is having more advantages than General Anaesthesia. [1] Bupivacaine is long acting effective Local Anaesthetic commonly administered by the intrathecal route for surgical anaesthesia . Levobupivacaine is the pure S (−) enantiomer of racemic bupivacaine. It is used in similar doses to bupivacaine and has a similar onset and duration. The majority of clinical studies using identical doses of Levobupivacaine and Bupivacaine have found no significant difference in clinical efficacy for spinal anesthesia. The main advantage of levobupivacaine is that it is less cardiotoxic than bupivacaine in the setting of spinal anesthesia.[1] Various adjuvants like opioids- morphine[2], buprenorphine,[3] fentanyl[4], pethidine[5],tramadol[6], nalbuphine[7]also, ketamine[8], midazolam[9], alpha 2[10]adrenergic agonists (clonidine, dexmedetomedine) have been used along with local anaesthetics (bupivacaine) with varied effects . Fentanyl is a Phenylpiperidine derivative. It is a synthetic opioid agonist that is structurally related to Meperidine. It acts as an agonist at mu opioid receptors. It has greater potency and more rapid onset of action due to greater lipid solubility (compared with morphine) which facilitates its passage across the blood brain barrier. Fentanyl in doses of 10 to 30 μg is commonly used in ambulatory surgery because of its rapid onset time of 10 to 20 minutes and relatively shorter duration of 4 to 6 hours[11]. There is scarcity of literature pertaining to use of Levobupivacaine (hyperbaric, 0.5%) plain and its comparison of Levobupivacaine (Hyperbaric, 0.5%) with Fentanyl Hence, this present study was planned.

MATERIAL AND METHODS

The present study was conducted in the department of Anaesthesiology at a tertiary care hospital during the period of Aug 2022 to Aug 2024 after approval from the Institutional Ethics Committee and valid informed consent from patient. The study was conducted in 110 adult patients admitted in the department of Surgery and Orthopaedics with the age in the range of 18-65 years posted for Infraumbilical surgery under subarachnoid block.

Inclusion Criterias Were: 1)Patient undergoing infraumbilical procedures under spinal anaesthesia. 2)ASA grade 1 & 2 .3) Age between 18-65 years. 4)Height between 150-170cm .5) Weight between 40-80 kg.6)Either sex. 7)Patient willing to undergo surgery under Spinal Anaesthesia .

Exclusion Criterias Were: 1)Patient who do not give consent for regional Anaesthesia. 2) ASA grade 3&4. 3) Patient with Coagulation disorders, local infection. 4) Patients with Neurological, cardiovascular and respiratory diseases. 5)

Septicemia. 6) Deformity or previous surgery of spine . 7) Morbid obesity. 8) Allergy to the study drug.

Detailed pre-anaesthetic evaluation of the patients was performed by an Anaesthesiologist a day before the surgery, 110 patients satisfying the inclusion and exclusion criteria were included in the study. Preliminary Investigations in the form of: 1) Complete blood count. 2) Random blood sugar. 3) Bleeding time, Clotting time. 4) Coagulation profile. 5) Liver function tests. 6) Kidney function tests. 7) Electrocardiography (ECG). 8) Chest x ray postero-anterior (PA) view were noted. 9) Specialized investigations, according to the patients for further evaluation, if required. All patients were kept nil by mouth for 8 hrs. All patients were given overnight sedation in the form of Tab. Alprazolam 0.5 mg orally a day prior to surgery. In operation theatre, multipara monitoring device with ECG, pulse rate, non-invasive blood pressure, SpO2 was attached to the patient and baseline parameters were noted. In the operation theatre a good peripheral intravenous access was secured using 18 G cannula and all patients were co-loaded with 10ml/kg of Ringer Lactate solution. Multipara monitor were attached and baseline respiratory rate, heart rate (HR), noninvasive systolic and diastolic blood pressure (SBP and DBP), peripheral oxygen saturation and electrocardiography (ECG) was recorded and continuous monitoring was started. Inj. ondensetron 4mg iv and inj. pantoprazole 40 mg iv was given as pre medication. Under all aseptic precautions, sub arachanoid block was given in L3 and L4 space with 25 gauge Quincke spinal needle via midline approach in lateral decubitus position.On free flow of cerebrospinal fluid, study drug was injected intrathecally .

- Group L(n=55): 2.5 ml of 0.5% Hyperbaric Levobupivacaine plus 0.5 ml of normal saline.
- Group LF(n=55): 2.5 ml of 0.5% Hyperbaric Levobupivacaine plus 0.5 ml fentanyl (25 μg) was given.

Patients were immediately turned to supine position and oxygen supplementation by Venti mask was started at the rate of 6 L/min. Continuous monitoring of respiratory rate, HR, noninvasive SBP and DBP, SpO2 and ECG was done at base line, Coloading, 0 min, 5 min, then at an interval of every 10 min up to 100 min and at 20 minutes interval till 180 minutes till completion of surgery. Sensory block onset and total time to achieve sensory level was noted. Motor block onset was noted using modified Bromage scale .Maximum sensory and motor blockade achieved and visual analogue score for pain assessment and sedation score was also noted. Time for regression to T10 was noted. Total duration of analgesia and maximum duration of motor blockade was also noted. Fluid management was done as per calculated fluid and blood loss . Postoperatively patients were shifted to Recovery room ansd heamodynamic monitoring was done till 24hrs in 6 hrs interval of time. for further monitoring. Intraoperatively and postoperatively, bradycardia (heart rate < 60 beats /min) was to be treated with 0.3mg of inj. Atropine and hypotension (SBP falling more than 20% of basal value or less than 80 mmhg) with 3-6mg Inj. Mephentermine as a bolus. Respiratory depression (spo2 < 90% or RR rate < 8 breaths /min) was treated by 100 % O2 with face mask or ventilation with IPPV accordingly.

Assessment of Sensory Block :

- Sensory block was assessed by loss of sensation to pin prick in the midline every 1 min for first 10 min and then at an interval of 5 min till no change in level occurred. Onset of sensory block (when patient does not feel pin prick at L1 level), highest level of sensory block achieved, time to maximum sensory block, regression of sensory block to T10 and total duration of sensory block (regression to S1 dermatome) was noted.

Assessment of Motor Block :

Motor block was assessed by using the modified Bromage scale [12] till the completion of surgery.

- Modified Bromage scale was taken as:
- 0 – No paralysis: Able to flex hips/knees/ankles
- 1 – able to move knees , unable to raise extended legs
- 2 – able to flex ankles, unable to flex knees
- 3 – unable to move any part of limb – complete block.

Maximum motor block achieved, time to maximum motor block and total duration of motor block (motor recovery to Bromage [0] was noted. All parameters were noted by taking the time of giving the study drug intrathecally as time 0 min. Surgery was allowed to start when sensory block to T10 dermatome was achieved. Haemodynamic changes: Heart rate, Systolic and diastolic blood pressure, respiratory rate , and spo2 were monitored at: Baseline, coloading, 0,5,10,20, 30,40,50,60,70,80,90,100,120,150,180min. Postoperatively monitored at 6hr, 12hr, 24hrs. Sedation scores was recorded just before the initiation of surgery and at 30min, 60min, 90min, 120min , 150min, 180min ,6HR, 12HR , 24HR .

Level of Sedation was Assessed Using a 5 Point Scale [13]

1- alert and wide awake.
2- Arousable to verbal commands .
3- Arousable to gentle tactile sensation .
4- Arousable to vigourous shaking .
5- unarousable

Duration of analgesia was recorded as time interval from the completion of anaesthesia to the time when the patient complains of pain with visual analogue score >4.

Intensity of Postoperative Pain was Assessed Using Visual Analogue Scale

Visual analogue scale [14] consists of a 10 cm line, marked at 1 cm each. The patient makes a mark on the line that represents the intensity of pain he or she experienced. Mark "0" represents no pain and mark "10" represents worst possible pain. The numbers marked by the patient was taken as units of pain intensity. 0 = no pain. 10= maximum pain.

In the postoperative period, patients were monitored for haemodynamic parameters and postoperative analgesia using VAS score at 6HR , 12HR ,24HR . Rescue analgesia in the form of injection Diclofenac 75 mg or if needed Inj. Tramadol Hydrochloride i.v was given when VAS >3 in both groups. Time at which patient demanded first dose of rescue analgesia was taken as total duration of analgesia. Patients were monitored for any side effects or complications like hypotension, bradycardia, nausea, vomiting, sedation, respiratory depression ,dizziness, urinary retention, pruritis, headache, backache and neurological changes for 24 hr. Any other complication was noted and treated in the post-opertative period.

Statistical Analysis

Data was collected, tabulated, coded then analysed using SPSS computer software version 20.0 and Microsoft word and excel was used to generate graphs and table etc.

- Numerical values were presented as mean & standard deviation (SD).
- Tests applied –student unpaired t-test ,student paired t-test ,chi –square test .
- Analysis of quantitative data between the two groups was done using student unpaired t test.
- Analysis of quantitative data in a single group was done using student paired t test .

- Qualitative data was represented in form of frequency and percentage association between qualitative variables was assessed by chi square test .p value.

>0.05	Non significant
<0.05	Significant
<0.001	Highly significant

RESULTS

110 patients enrolled in the study were comparable in Demographic characteristics like Age, Sex, Height, Weight and also In terms of ASA Grading and Duration of surgery (p>0.05).

Sensory Block Characteristics

The mean (±SD) time of onset of sensory block at L1 in group LF(Levobupivacaine + fentanyl) (2.10 ±0.81 minutes) was significantly earlier than in group L (levobupivacaine) (2.40±0.83 minutes) (p= 0.04) . The mean (±SD) time to achieve maximum sensory level in group LF (Levobupivacaine + fentanyl) (6.26±1.95 minutes) was significantly earlier than in group L (Levobupivacaine) (8.94 ±1.60 minutes) 6.26±1.95 minutes. (p=0.001). The mean (± SD) time to regression to T10 in group LF (74.72 ±5.76 minutes) was significantly prolonged than in group L (58.05 ±12.55 minutes) (p =0.001). The mean (±SD) time of total duration of sensory blockade in group LF (216.18 ±19.16 minutes) was significantly prolonged than in group L(176 .12 ±8.64 minutes) (p<0.001).

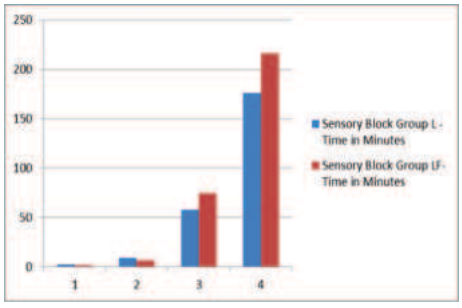

Figure 1: Sensory Block Characteristics: 1- Sensory Onset Time. 2- Time to achieve maximum sensory level. 3 – Time for regression to T10. 4 – Total duration of Sensory Blockade.

Motor Block Characteristics :

The mean (±SD) time of motor onset in group LF (2.13±0.9 minutes) was significantly earlier than group L (2.52±0.33 minutes) (p=0.008). The mean (±SD) time for maximum motor blockade in group L (3.72 ±1.51 minutes) and in group LF (3.60± 1.34 minutes) was statistically non-signficant. (p= 0.66). The mean (±SD) time of total duration of motor blockade in group LF (190.01 ±17.98 minutes) was significantly prolonged than in group L (166.47±10.91 minutes) (p<0.001).

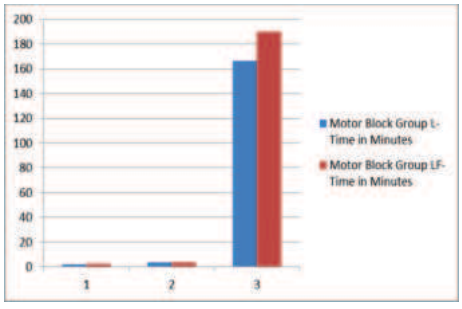

Figure 2: Motor Block Characteristics: 1- Motor Block Onset. 2- Time to achieve maximum Motor Blockade. 3 – Total Duration of Motor Blockade.

The mean (±SD) time for total duration of analgesia in group LF (179.05±14.81 minutes) was significantly prolonged in group L (154.87 ±10.60 minutes) (p<0.001).

Mean VAS score-The mean (±SD)VAS SCORES, from 120mins to 6 hours were significantly less in in group LF than in group L (p<0.001) .

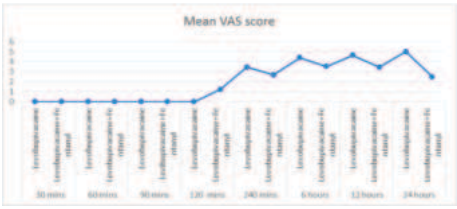

Figure 3: Comparison of Mean VAS Score in Both Groups at Different Time Intervals

Mean Sedation Score-

The mean (±SD) sedation score at 90mins in group L was 1±2 and in group LF was 3.0±2.2 which was statistically significant p=0.0001 (HS) .

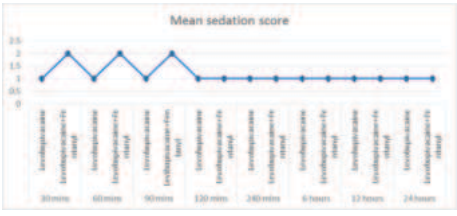

Figure 4: Comparison of Mean Sedation Score in Both Groups at Different Time Interval

Table No: 2 Perioperative Complications

Side effects	Group L (n=55)	Group LF (n=55)
Hypotension	0	0
Bradycardia	0	0
Nausea	1	1
Vomiting	0	1
Pruritis	0	0
Respiratory depression	0	0
Urinary retention	0	0
Shivering	0	0

In Levobupivacaine group 1(1.81%) patient had nausea. Whereas, in Levobupivacine + Fentanyl group 1(1.81%) patient each had nausea and vomiting.

None of the patients had hypotension, bradycardia, pruritis , respiratory depression, urinary retention and shivering.

DISCUSSION

Perioperative pain management is one of the important task to the Anaesthesiologist. Pain relief is necessary for both humanitarian and therapeutic reasons. The majority of clinical studies using identical doses of Levobupivacaine and Bupivacaine have found no significant difference in clinical efficacy for spinal anesthesia. The main advantage of Levobupivacaine is that it is less cardiotoxic than bupivacaine in the setting of spinal anesthesia. [1,15]Fentanyl in doses of 10 to 30 μg is commonly used in ambulatory surgery because of its rapid onset time of 10 to 20 minutes and relatively shorter duration of 4 to 6 hours.[11,15,16.] In recent times, the role of subarachnoid and epidural opioids for the relief of perioperative and postoperative pain promotes a new platform in this field.

A total number of 110 patients, belonging to age group 18-65 years have been selected and divided into two groups of 55 each -Group L and Group LF. The two groups were comparable with respect to Demographic characteristics age, weight and height.

Sensory Block Characteristics:

Onset of Sensory Block: In our study, the mean±SD time of

Onset of sensory block was significantly earlier in group LF (2.10±0.81 minutes) than group L (2.4±0.83 minutes) (p=0.04)(S).

In a study conducted by Ozyilkan N, Kocum A et al [17], they observed that the mean±SD time of Onset of sensory block was significantly earlier in group LF (1.50(1-8) minutes) than group L (8.00(3-12) minutes) (p=0.00)(S). In a study conducted by Mathur V, Verma A et al[18] they observed that the , the mean±SD time of Onset of sensory block at T8 was significantly earlier in group LF (4.7±1.70 minutes) than group L (5.6±1.53 minutes) (p=0.015)(S). In a study conducted by Attri J,Kaur G et al[19] they observed that the mean±SD time of Onset of sensory block at T10 was significantly earlier in group LF (4.8±1.50 minutes) than group L (7.6±1.46 minutes) (p=0.00)(S). F. Maniyar, Jain T et al [20] observed that the mean±SD time of Onset of sensory block at T10 was significantly earlier in group LF (5.92±1.05 minutes) than group L (7.93±1.38 minutes) (p=0.00)(S). Shrinivasan E.M et al [11] observed that the mean±SD time of Onset of sensory block at T10 was significantly earlier in group LF (5.9±0.6 minutes) than group L (8.1±0.8 minutes) (p=0.00)(S).

All the above mentioned studies have used Isobaric Levobupivacaine. In our study we have used Hyperbaric Levobupivcaine(0.5%). In our study, the onset of sensory block was significantly earlier in Levobupivacaine with Fentanyl group than in Levobupivacaine Group (0.04)(S). Hence, this finding from our study was in accordance with the studies of Ozyilkan N, Kocum A et al, Mathur V,Verma A et al, Attri J,Kaur G et al, F.Maniyar, Jain T et al, Shrinivasan E.M.

The Maximum Sensory Block Achieved Along with Duration-

In our study, the mean±SD time required to achieve maximum sensory level was significantly earlier in Levobupivacaine with Fentanyl group (6.26±1.95 mins) than in Levobupivacaine group (8.94±1.60 mins) (p<0.001)(HS). The maximum sensory level achieved in levobupivacaine group was T6 and in Levo-Bupivacaine with fentanyl group was T6.

In the study conducted by Shrinivasan E.M et al(2022)[11], the mean±SD time to achieve maximum sensory level in Levobupivacaine group was 10.7±1.5 mins and in Levobupivacaine with Fentanyl was 7.8±0.6 mins. The time required to achieve maximum sensory level was significantly earlier in Levobupivacaine with Fentanyl than in Levobupivacaine group (p=0.00)(HS). Ozyilkan N, Kocum A et al [17] found that the time to achieve maximum sensory level in group L was 12.70±3.74 mins and in group LF was 7.52±2.18mins . The time required to achieve maximum sensory level was significantly earlier in group LF than in group L (p=0.00)(HS). F.Maniyar, Jain T et al [20] in their study found that the mean ±SD time to achieve maximum sensory level in group L was 13.87±2.64 mins and in group LF was 11.53±1.14 mins. The time required to achieve maximum sensory level was significantly earlier in group LF than in group L (p=0.00)(HS). Attri J,Kaur G et al[19] found that the time to achieve maximum sensory level in group L was 15.80±2.43 mins and in group LF was 8.46±1.87 mins . The time required to achieve maximum sensory level was significantly earlier in group LF than in group L (p=0.00)(HS).

Hence , the findings regarding time to achieve maximum sensory blockade from our study were similar to the findings from Ozyilkan N, Kocum A et al, F.Maniyar, Jain T et al, Attri J,Kaur G et al.

Time for Regression to T10:

In our study we found that the mean±SD time required for regression to T10 was significantly delayed in Levobupivcaine+ Fentanyl group (74.72±5.76 minutes) than Levobupivacaine group (58.05±12.55 minutes) (p<0.001)(HS).

In a study conducted by Girgin NK, Gurbet A et al[21] they observed that the mean±SD time for 2 segment regression was 61±12 minutes in group L and 73±15 minutes in group LF. The time required for 2 segment regression was significantly earlier in group L than in group LF (p<0.001)(HS). Attri J,Kaur G et al[19] found in their study that the mean±SD time for regression to T10 was 95.58±5.32 minutes in group L and 106.62±6.17 minutes in group LF. The time required for regression to T10 was significantly earlier in group L than in group LF (p<0.00)(HS). Shrinivasan E.M et al[11] found in their study that the mean±SD time for regression to T10 was 89.0±8.1 minutes in group L and 112.3±8.6 minutes in group LF. The time required for regression to T10 was significantly earlier in group L than in group LF (p=0.00)(HS).

The findings regarding the time to regression for T10 from our study were similar to the findings from Girgin NK, Gurbet A et al, Attri J,Kaur G et al, Shrinivasan E.M et al.

Total Duration of Sensory Blockade -

In our study, the mean±SD time for total duration of sensory blockade(minutes) was significantly prolonged in Levobupivacaine + Fentanyl group (216.18±19.16 minutes) than Levobupivacaine group (176.12±8.64minutes) (p=0.001)(HS).

F.Maniyar, Jain T et al [20]found that the mean±SD time for total duration of sensory blockade(minutes) was significantly prolonged in group LF(219.03±29.85 minutes) than group L (171.24±10.46 minutes) (p=0.00)(HS). Shrinivasan E.M et al[11] found the mean±SD time for total duration of sensory blockade(minutes) was significantly prolonged in group LF(233.6±30.6 minutes) than group L (173.7±10.5 minutes) (p=0.00)(HS).

Hence, The findings regarding the total duration of sensory blockade from our study were similar to the findings from Shrinivasan E.M et al, F.Maniyar, Jain T et al.

Motor Block Characteristics:

Onset of Motor Blockade:

In our study , the mean±SD time for onset of motor blockade was significantly earlier in Levobupivacaine + Fentanyl group (2.13±0.90 mins) than in Levobupivacaine group (2.52±0.33 mins) (p=0.008)(HS).

Ozyilkan N, Kocum A et al [17] found the mean(range) time for onset of motor blockade was 10.0(7-15) mins in group L and 3.0(1.5-20)mins in group LF. The mean(range) time for onset of motor blockade was significantly earlier in group LF than in group L (p=0.00)(HS).

Hence, The findings from our study about the onset of motor blockade was similar to the findings from the study conducted by Ozyilkan N, Kocum A etal.

Time for Maximum Motor Blockade:

In our study, the mean±SD time to achieve maximum motor blockade was 3.72±1.51 mins in Levobupivacaine group and 3.60±1.34 mins in Levobupivacaine + Fentanyl group, which was comparable (p=0.66)(NS).

Mathur V,Verma A et al[18] found that the mean±SD time to achieve maximum motor blockade was 9.25±1.64 mins in group L and 7.45±1.74 mins in group LF. The mean±SD time for maximum motor blockade in group LF was significantly earlier in group L (p<0.001)(HS). Shrinivasan E.M et al[11] found that the mean±SD time to achieve maximum motor blockade was 13.5±1.3 mins in group L and 9.6±1.1 mins in group LF. The mean±SD time for maximum motor blockade in group LF was significantly earlier in group L(p=0.00)(HS).

In the studies conducted by Mathur V,Verma A et al,

Shrinivasan E.M et al, the time for maximum motor blockade was achieved earlier in Levobupivacaine (isobaric) with Fentanyl group than Levobupivacaine (isobaric) group. The findings from our study that the time for maximum motor blockade was comparable in both the groups might be because we have used hyperbaric Levo-bupivacaine in our study.

Total Duration of Motor Blockade:

In our study, the mean±SD time for total duration of motor blockade was significantly prolonged in Levobupivacaine +Fentanyl group (190.01±17.98 mins) than in Levobupivacaine group (166.47±10.91 mins) (p=0.001)(HS).

Attri J,Kaur G et al[19] found that the mean±SD time for total duration of motor blockade was 152.76±9.79 mins in group L and 188.52±9.81 mins in group LF. The mean±SD time for total duration of motor blockade was significantly more in group LF than in group L(p=0.001)(HS). Shrinivasan E.M et al[11] found that the mean±SD time for total duration of motor blockade was 156.9±10.2 mins in group L and 195.5±13.2 mins in group LF. The mean±SD time for total duration of motor blockade was significantly more in group LF than in group L (p=0.00)(HS).

Hence, The finding regarding the time for total duration of motor blockade was comparable with the studies conducted by Shrinivasan E.M et al , Attri J,Kaur G et al.

Duration of Analgesia:

In our study, the mean±SD time for total duration of analgesia was significantly prolonged in Levobupivacaine + Fentanyl group (179.05±14.81 mins) than in Levobupivacaine group (154.87±10.60 mins) (p<0.001)(HS).

Ozyilkan N, Kocum A et al [17] found that the mean±SD time for first request of analgesia was 141.11±26.17 mins in group L and 174.72±25.16 mins in group LF. The mean±SD time for total duration of analgesia was significantly more in group LF than in group L(p<0.00)(HS). Attri J,Kaur G et al[19] found that the mean±SD time for total duration of analgesia was 168.16±11.08 mins in group L and 265.16±26.18 mins in group LF. The mean±SD time for total duration of analgesia was significantly more in group LF than in group L(p=0.001)(HS). Bidikar M,Mudakanagoudar M et al[22] found that the mean±SD time for first request of analgesia was 185.93±11.09 mins in group L and 231.26±10.92 mins in group LF. The mean±SD time for total duration of analgesia was significantly more in group LF than in group L(p=0.00)(HS).

Hence, The findings regarding the time for total duration of analgesia was comparable with the studies conducted by Ozyilkan N, Kocum A et al , Shrinivasan E.M et al , Attri J,Kaur G et al.

Vas Score

The difference between the mean±SD VAS score was significantly less in Levobupivacaine +Fentanyl group than Levobupivacaine group at 120mins, 240mins, 6hrs (p<0.05) and rest the difference was non-significant(p>0.05).

Shrinivasan E.M et al[11] observed that the mean±SD VAS score in group LF at 120mins, 180mins, 240mins was (0.233±0.77),(1.567±1.54),(3.1±0.844) respectively and in group L was (2.8±1.24), (2.23±1.04), (2.20±0.61) respectively. The mean ±SD VAS scores were significantly less in group LF than in group L(P<0.005).The mean±SD VAS scores were comparable in rest of the study period.

Hence, The findings from study regarding the mean VAS score were similar to the findings from, Shrinivasan E.M et al, Mathur V, Verma A et al.

Sedation Score

In our study, the mean±SD sedation score was significantly more in levobupivacaine with fentanyl group than levobupivacaine group at 90min. The patients were mildly sedated and arousable to tactile stimulation. The mean±SD sedation scores were comparable in both the groups in rest of the study period.

Complications

In Levobupivacaine group 1(1.81%) patient had nausea. Whereas, in Levobupivacine + Fentanyl group 1(1.81%) patient each had nausea and vomiting.

None of the patients had hypotension, bradycardia, pruritis , respiratory depression, urinary retention and shivering.

Bidikar M, Mudakanagoudar M et al[22] noted that 6(20%) patients had hypotension, 3(10%) patients had bradycardia, 4(13%) patients had nausea in group L. In group LF, 5(16%) patients had hypotension, 2(6%) patients had bradycardia, 3(10%) patients had nausea. Complications in both the groups were statistically non-significant.

F. Maniyar, Jain T et al [20] observed that 1(1.42) in group LF and 2(2.85%) patients in group L developed bradycardia. None of the patient had nausea and vomiting, headache or backache. 2(2.85%) patients in group LF had pruritis whereas none of the patient in group L had pruritis.

In our study incidence of adverse effects were minimal and managed accordingly.

CONCLUSION

From the present study, we conclude that Levo-Bupivacaine (hyperbaric, 0.5%) with Fentanyl combination is better than Levobupivacaine plain (hyperbaric, 0.5%) for Sub-arachnoid block in infra-umbilical surgeries, as it provides earlier onset of sensory and motor blockade, earlier time to achieve maximum sensory blockade, prolonged duration of sensory and motor blockade along with prolonged postoperative analgesia with stable vitals and minimal side effects.

However, a longer duration of motor blockade was seen with Fentanyl .To validate this finding, further studies with larger sample size is imperative.

REFERENCES

1. Miller' anaesthesia ,9th edition.
2. Abouleish, Ezzat, et al. "Combined intrathecal morphine and bupivacaine for cesarean section." Anesthesia & Analgesia 67.4 (1988): 370-374.
3. Agarwal, Kiran, et al. "Comparative analgesic efficacy of buprenorphine or clonidine with bupivacaine in the caesarean section." Indian Journal of Anaesthesia 54.5 (2010): 453-457.
4. Singh, Vinita, Lokesh Kumar Gupta, and G. P. Singh. "Comparison among intrathecal fentanyl and butorphanol in combination with bupivacaine for lower limb surgeries." Journal of Anaesthesiology Clinical Pharmacology 22.4 (2006): 371-375.
5. Kumar, Aditya, et al. "Comparison of intrathecal morphine and pethidine for post caesarean analgesia and side effects." Journal of Anaesthesiology Clinical Pharmacology 23.1 (2007): 35-39.
6. Afolayan, Jide Michael, et al. "Intrathecal tramadol versus intrathecal fentanyl for visceral pain control during bupivacaine subarachnoid block for open appendicectomy." Nigerian journal of clinical practice 17.3 (2014): 324-330.
7. Gupta, Kumkum, et al. "Intrathecal nalbuphine versus intrathecal fentanyl as adjuvant to 0.5% hyperbaric bupivacaine for orthopedic surgery of lower limbs under subarachnoid block: A comparative evaluation." Indian Journal of Pain 30.2 (2016): 90-95.
8. Kathirvel, S., et al. "Effects of intrathecal ketamine added to bupivacaine for spinal anaesthesia." Anaesthesia 55.9 (2000): 899-904.
9. Ho, K. M., and H. Ismail. "Use of intrathecal midazolam to improve perioperative analgesia: a meta-analysis." Anaesthesia and intensive care 36.3 (2008): 365-373.
10. Schwartz, Ruben H., et al. "A Comprehensive Review of the Use of Alpha 2 Agonists in Spinal Anesthetics." Pain physician 25.2 (2022): E193.
11. Srinivasan, E. M. Comparison of Levobupivacaine and Levobupivacaine with Fentanyl in Infraumbilical Surgeries under Spinal Anaesthesia. Diss. Madras Medical College, Chennai, 2020.
12. Graham, A. C., and J. H. McClure. "Quantitative assessment of motor block in labouring women receiving epidural analgesia." Anaesthesia 56.5 (2001): 470-476.

13. Lee, Y. Y., et al. "Levobupivacaine and fentanyl for spinal anaesthesia: a randomized trial." European Journal of Anaesthesiology 22.12 (2005): 899-903.
14. Heller, Gillian Z., Maurizio Manuguerra, and Roberta Chow. "How to analyze the Visual Analogue Scale: Myths, truths and clinical relevance." Scandinavian journal of pain 13.1 (2016): 67-75.
15. KD Tripathi, essentials of medical pharmacology;8th edition.
16. Stoelting' pharmacology and physiology in anesthetic practice ,5th edition.
17. Ozyilkan NB, Kocum A, Mesut Sener, Esra Caliskan, Ebru Tarim, Pinar Ergenoglu, Anis Aribogan, Comparison of Intrathecal Levobupivacaine Combined with Sufentanil, Fentanyl, or Placebo for Elective Caesarean Section: A Prospective, Randomized, Double-Blind, Controlled Study,Current Therapeutic Research,Volume 75,2013.
18. Mathur, Veena, et al. "A prospective randomized study to compare intrathecal isobaric levobupivacaine with or without fentanyl in various infraumbilical surgeries." The Indian Anaesthetists Forum. Vol. 23. No. 2. Medknow, 2022.
19. Attri, JP, et al. "Comparison of levobupivacaine and levobupivacaine with fentanyl in infraumbilical surgeries under spinal anaesthesia." Anesthesia Essays and Researches 9.2 (2015): 178-184.
20. Maniyar, F., J. Trishala, and K. O. Praveen. "Spinal anesthesia for transurethral resection of prostate: Levobupivacaine with or without fentanyl." Int. J. Anesth. Res 4.11 (2016): 358-362.
21. Girgin, N. K., et al. "The combination of low-dose levobupivacaine and fentanyl for spinal anaesthesia in ambulatory inguinal herniorrhaphy." Journal of International Medical Research 36.6 (2008): 1287-1292.
22. Bidikar M, Mudakanagoudar MS, Santhosh MCB. Comparison of Intrathecal Levobupivacaine and Levobupivacaine plus Fentanyl for Cesarean Section. Anesth Essays Res. 2017 Apr-Jun;11(2):495-498. doi: 10.4103/aer.AER_16_17. PMID: 28663648; PMCID: PMC5490141.