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Supraclavicular Brachial Plexus Block: A Comparative Clinical Study between Bupivacaine and Levobupivacaine.

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ABSTRACT

Background: Supraclavicular brachial plexus block is an excellent regional anaesthesia technique for upper extremity surgery. Bupivacaine is most commonly used local anaesthetic in peripheral nerve blocks. The cardiotoxicity of bupivacaine limits its use in large volumes necessitating the need for alternative drugs in upper extremity blocks. Levobupivacaine is a promising drug with less cardiodepressor activity. The basis for this study is to compare its sensory and motor blockade with that of bupivacaine. **Methods**: This study included 60 ASA grade I and II patients of both sex aged 18 years and above, weighing between 50-70 kg undergoing upper limb orthopaedic surgery. They were randomly allocated to group B (received 30 ml 0.5% bupivacaine) and group L (received 30 ml 0.5% levobupivacaine). Comparison was made regarding onset, duration and quality of sensory and motor blockade between the two groups. **Results:** Statistically significant difference was found in the onset of sensory and motor blockade between the two drugs with short latency in-group B. **Conclusion**: Levobupivacaine proves to be a comparable and better alternative to bupivacaine in supraclavicular brachial plexus block owing to its cardiostability.

Keywords: Bupivacaine, Levobupivacaine, Supraclavicular Brachial plexus block.

INTRODUCTION

Since the discovery of local anaesthetic drugs, the need for pain relief during surgery without loss of consciousness is appreciated more and more, both by anaesthesiologist and surgeons. Numerous routes to perform brachial plexus block have been described, like supraclavicular, interscalene, infraclavicular and axillary. The supraclavicular technique used by Kulenkampff in 1912 revealed that the nerves supplying the arm and the forearm are grouped closely together in the brachial plexus and a single injection could provide analgesia for the whole limb.[1] As technique is relatively simple and provides good anaesthesia and analgesia it is preferred than general anaesthesia. The supraclavicular route was used in this study as it is easy to perform, small volume of local anaesthetic solution is required as three trunks are compactly arranged resulting in a rapid onset of reliable blockade. Lanz et al (1983) showed that blockade of the brachial plexus with a supraclavicular technique Directed near the first rib provides the most reliable,[2] uniform, and predictable anaesthesia for the upper extremity.

Bupivacaine is an amide local anaesthetic.[3] It prevents transmission of nerve impulses by inhibiting passage of sodium ions through selective ion channel in nerve membranes. This slows the rate of depolarization such that threshold potential is not reached and action potential not propagated4. The half life of bupivacaine in adults is 3.5 hours. Bupivacaine is mainly hydrolysed to pipecolic acid, although about 5% of the dose is converted to a dealkylated metabolite (pipecoloxylidide). Both these metabolites are eliminated in urine.

Levobupivacaine is the S-enantiomer of bupivacaine and is chemically described as (S)-1-butyl-2-piperidylformo-2',6'xylidide hydrochloride.[4-7] Plasma protein binding of levobupivacaine is >97%. Levobupivacaine is extensively metabolised by liver. The mean elimination half life is 3.3 hours.

Aims

This randomized, prospective, controlled trial study was undertaken at Government Medical College and Hospital, Aurangabad during the year 2012-2015, in 60 patients undergoing orthopaedic surgeries of forearm. Permission for the conduct of the study was obtained from the ethical committee of the same

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institution. Written informed consent was obtained from each patient included in the study.
Comparative study was done between 30 ml 0.5 % bupivacaine and 30 ml 0.5 % levobupivacaine in supraclavicular brachial plexus block.
Following parameters were studied:

1) Onset of sensory block
2) Onset of motor block
3) Duration of postoperative analgesia
4) Incidence of side effects
5) Evaluation of technique by surgeons and patients
6) To correlate the results of the study with the available literature.

MATERIALS AND METHODS

The patients posted for upper arm surgery in orthopedic operation theatre were included in this study. Sixty patients of both sex of ASA grade I and II, in age group of 18 years and above, weighing 50 to 70 kilograms and willing to undergo procedure under brachial plexus block were selected. A detailed preoperative assessment of all patients was done.
Patients having history of hypersensitivity to Bupivacaine or Levobupivacaine, coagulopathy, local infection, fever, chest injuries, pregnant and lactating patients were excluded from this study.
Patients were randomly assigned to 2 groups:-
Group B (Bupivacaine) (n=30): who received brachial plexus block with 30 ml of 0.5% Bupivacaine.
Group L (Levobupivacaine) (n=30): who received brachial plexus block with 30 ml of 0.5 % Levobupivacaine.
The procedure was explained in detail and written, valid and informed consent was obtained from all patients. A detailed physical and systemic examination was done and thorough history of all patients obtained. The following data, e.g. age, weight, sex, pulse rate, respiratory rate, blood pressure, SpO2 and general examination was noted.
Routine investigations such as hemoglobin, total leukocyte count, differential leukocyte counts, urine examination, blood sugar, blood urea, coagulation profile were done.
After confirming NBM status, the patients received Tablet Rantac 150 mg orally 2 hours prior to surgery. Patients were provided anxiolysis and sedation with Inj. Midazolam – 0.02 mg/kg. NIBP, ECG and pulse oxymeter was applied. Intravenous line was secured with 18 G angiocath in large peripheral vein. Oxygen supplementation was started at the rate of 5 litres/min. The patient was placed in a supine position with the head turned away from the side to be blocked. The arm to be anesthetized was adducted, and the hand was extended along the side toward the ipsilateral knee. In the classic technique, the midpoint of the clavicle should be identified and marked. The posterior border of the sternocleidomastoid can be palpated easily as the patient raises the head slightly. The palpating fingers can then roll over the belly of the anterior scalene muscle into the interscalene groove, approximately 1.5 to 2.0 cm posterior to the midpoint of the clavicle. Palpation of the subclavian artery at this site confirms the landmark. After appropriate preparation and development of a skin wheal, the anaesthesiologist stood at the side of the patient facing the patient's head. A 23-gauge, 4-cm needle was directed in a caudal, slightly medial, and posterior direction until a paraesthesia or motor response was elicited or the first rib was encountered. If the first rib is encountered without elicitation of a paraesthesia, the needle can be systematically walked anteriorly and posteriorly along the rib until the plexus or the subclavian artery is located. After this, 2-3 ml of drug was injected rapidly after aspiration. After this, 30 ml of 0.5% solution of bupivacaine or 30 ml of 0.5% solution of levobupivacaine was infiltrated with repeated aspirations every 6.5-7.0 ml to avoid intravascular injection. Needle was withdrawn and gentle massage was done at site of injection. During the whole procedure a watch was kept for development of any complications like nausea, vomiting, respiratory depression or bradycardia. Pulse, respiration, SpO2 and blood pressure were recorded at 5ms, 10ms, 15ms, 20ms, 30ms, 45ms, 60ms, 90ms, 120ms, 4 hrs, 6 hrs, 18 hrs, 24 hrs after completion of the injection. Postoperatively if patient complained of pain, Inj. Diclofenac sodium 3 cc (75 mg) intramuscularly was given as rescue analgesic to relieve pain and vomiting treated with I.V. Inj. Ondansetron 4 mg.

Assessments

The primary outcome measure was comparing the latency and prevalence of failure of the motor blockade. Secondary outcome measures were evaluation of the effectivity of the motor and sensorial blockades, the degree of the motor blockade, and the presence of adverse events.
The sensory block was tested by sensation of pinprick and compared with same area on contralateral arm.It was assessed by the 'Hollmen Scale'. Motor block was evaluated by movement at the fingers, wrist, elbow and shoulder joints and assessed by the 'Modified Bromage Scale'.

1. Onset of sensory block: This was defined as minimum of grade 2 of Hollmen scale in the distribution of any one of the four major nerves.

Hollmen scale

I. Normal sensation of pinprick.
II. Pinprick felt as sharp pointed but weaker compared with same area in the other upper limb.

III. Pinprick recognized as touch with blunt object.
IV. No perception of pinprick.

2. Onset of motor block: This was defined as minimum of grade 1 of Modified Bromage scale.

Modified Bromage scale:

Grade 0-No block, total arm and forearm flexion.
Grade I - Partial block, total forearm and partial arm flexion.
Grade II - Almost complete block, inability to flex the arm and decreased ability to flex the forearm.
Grade III - Total block, inability to flex both arm and forearm.

3. Quality of sensory block: The quality of the sensory block was graded from 1 to 4 according to Hollmen scale.
4. Quality of motor block: The quality of the motor block was graded from 0 to 3 according to Modified Bromage scale.
5. Total surgical time:
6. Tourniquet discomfort
7. Intraoperative condition
8. Recovery from sensory block
9. Recovery from motor block
10. Intraoperative and post operative complications
11. Monitoring of vital parameters
12. Duration of analgesia.

RESULTS

Total 60 patients were included in this study and divided in two groups of 30 patients each.There was no statistical difference and both groups were comparable. Demographic variables of each group are shown in [Table 1].

Table 1: Showing Demography and Baseline Parameter

Parameter	Group B (n=30)	Group L (n=30)	p-value
Age (years) Mean + SD 21-30 31-40 41-50 >50	 31.17 ± 8.00 6(20.0%) 15(50.0%) 7(23.3%) 2(6.7%)	 37.30 ± 7.88 6(20.0%) 14(46.7%) 8(26.7%) 2(6.7%)	0.948 NS* 0.836**
Sex: Male Female	 20(66.7) 10(33.3)	 13(43.3) 17(56.7)	 0.076 NS***
Weight (kgs) Mean + SD	57.60 ± 4.93	57.20 ± 4.79	0.751 NS*
Diagnosis # BBFA # Galleazzi # Monteggia # RADIUS And #ULNA	 16(53.3) 6(20.0) 3(10.0) 5(16.7)	 13(43.3) 7(23.3) 4(13.3) 6(30.0)	 0.879 NS****

Value: Number(%) (otherwise mentioned)
Fracture
* Unpaired t test, Two tailed p value > 0.05 Not Significant (@95% CL)
** Chi-Square test for trend, Two tailed p value > 0.05 Not Significant (@95% CL)
***Fisher's Exact test, p value >0.05 Not Significant (@95% CL)
****Chi-Square test, Two tailed p value > 0.05 Not Significant (@95% CL)

The sensory block was assessed by Hollmen scale and achievement of grade 2 of sensory block was considered as time for onset. Mean onset of sensory block in group B was 9.33 ± 3.27 minutes, while it was 16.13 ± 2.83 minutes in group L. This difference was statistically significant with earlier onset of sensory block in group B (p-value < 0.0001). In group L, onset of sensory block was >15 minutes in 21 (70.0%) patients and in group B, 27 (90.0%) patients had onset of < 15 minutes. This difference was statistically significant showing more patient had earlier onset of sensory block in group B than group L (p-value < 0.0001).

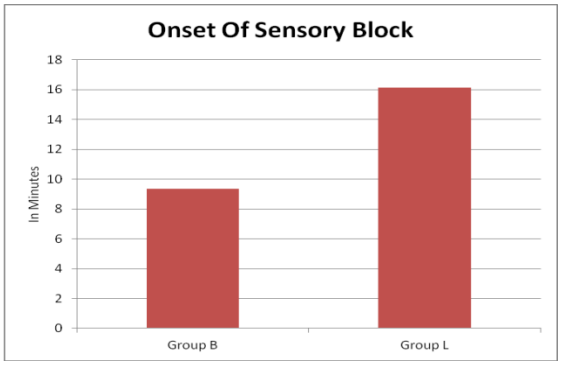

Figure 1: Bar diagram of patients according to onset of sensory block

X axis-Group B-Bupivacaine; group L-Levobupivacaine
Y axis- Onset of sensory block in minutes.

The motor block was assessed by Modified bromage scale and achievement of grade 1 of motor block was considered as time for onset. Mean onset of motor block in group B was 12.17 ± 2.18 minutes, while it was 20.00 ± 2.79 minutes in group L. The difference was statistically significant with earlier onset of motor block in group B (p-value < 0.0001). In group L, onset of motor block was >20 minutes in 14(46.7%) patients and in group B, 26 (86.67%) patients had onset of motor block < 15 minutes. This difference was statistically significant showing more patients had earlier onset of motor block in group B than group L (p-value< 0.0001).

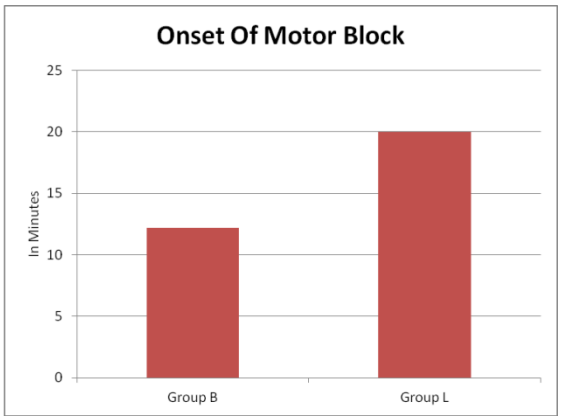

Figure 2: Bar Diagram Showing Distribution Of Patients According To Onset Of Motor Block.

X axis- Group B-Bupivacaine; Group L-Levobupivacaine
Y axis- Onset of motor block in minutes.

Mean duration of surgery in group B was 92.37 ± 6.45 minutes (Range 74 to104 minutes), while in group L was 92.00 ± 4.77 minutes (Range 76 to 102 minutes). No statistically significant difference was observed with respect to duration of surgical procedure in both groups (p-value 0.803). The quality of sensory block was assessed by Hollmen scale and motor block by modified bromage scale.

All patients achieved grade 4 of Hollmen scale for sensory blockade and grade 3 of Modified Bromage scale.

The quality of sensory and motor block was comparable between both the groups.

Mean time of recovery from motor block in group B was within 165.16 ± 15.93 minutes, while it was 164.00 ± 16.16 minutes in group L. This difference was not statistically significant. (p-value = 0.779). Recovery from motor block was the time at which the patient had achieved grade 0 in Modified Bromage scale. Mean time for recovery of sensory block in group B was 174.90 ± 12.79 minutes, while it was 175.50 ± 12.41 minutes in group L. This difference was not statistically significant (p-value = 0.854). Recovery from sensory block was the time at which the patient had achieved grade 1 in Hollmen scale of sensory block.

Monitoring of pulse rate was done and data was recorded at pre-op 5, 10, 15, 20, 30, 45, 60, 90, 120 minutes, 4, 6, 12, 18 and 24 hours. No statistically significant difference was found in both the groups with respect to pulse rate (p value >0.05). Monitoring of blood pressure was done and data was recorded at pre-op, 5, 10, 15, 20, 30, 45, 60, 90, 120 minutes, 4, 6, 12, 18 and 24 hours. There was no statistically significant difference in both the groups with respect to blood pressure (p value >0.05). Monitoring of respiratory rate was done and data was recorded at pre-op, 5, 10, 15, 20, 30, 45, 60, 90, 120 minutes, 4, 6, 12, 18 and 24 hours. No statistically significant difference was found in both groups with respect to respiratory rate (p value>0.05). 5 (16.7%) patients in group B had tourniquet pain while 3(10.0%) patients in group L had tourniquet discomfort. There was no statistically significant difference between the two groups regarding tourniquet discomfort. (p - value 0.448). The patients were asked to evaluate the technique as per procedure, tourniquet discomfort and post-operative analgesia. In group B, 2(6.7%) patients judged the technique as poor, 8(26.7%) as moderate and 20(66.7%) as good. In group L, 2(6.7%) patients judged the technique as poor, 7(23.3%) patients judged the technique as moderate and remaining 21(70.0%) as good. Statistically significant difference was not found between the groups with this respect (p-value 0.955). The surgeons were asked to evaluate the technique in relation to intraoperative conditions of sensory blockade, muscle paralysis, bloodless operative field and duration of postoperative analgesia.

In group B, surgeons judged the technique in 3(10%) cases as poor, 9(30.0%) as moderate and 18(60.0%) as good. In group L, surgeons judged the technique in 4(3.3%) cases as poor, 10(33.3%) as moderate and 16(53.3%) as good. Statistically significant difference was not found with this respect (p-value 0.855). Mean duration of post-operative analgesia in group B was 193.56 ± 23.51 minutes while it was 192.83 ± 23.54 minutes in group L. Significant statistical difference was not observed. (p value =0.766). In Group B, there was 1 episode of nausea and 1 episode of vomiting while in group L, there were 2 episodes of nausea and 1 episode of vomiting. In group B, 1 patient and in group L, 2 patients experienced sedation. No patient in either group experienced any episode of bradycardia, hypotension, respiratory depression or any other block related complication. No statistically significant difference was found regarding intraoperative and postoperative complications (p-value>0.05).

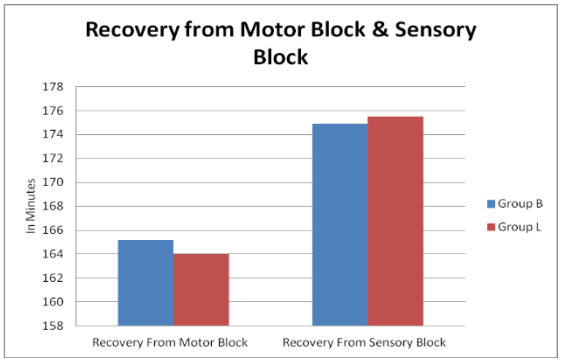

Figure 3: Bar Diagram Showing Distribution Of Patients According To Recovery From Motor And Sensory Block.

X axis- Group B-Bupivacaine; Group L-Levobupivacaine
Y axis- Recovery from block in minutes.

DISCUSSION

Supraclavicular route has emerged to be the preferred approach as it is simple to master in terms of technique and with fewer complications than other approaches. Bupivacaine is a popular local anaesthetic for brachial plexus block but is cardiotoxic.[8] We compared bupivacaine with its levorotatory isomer i.e. levobupivacaine in supraclavicular brachial plexus block. Levobupivacaine has potency similar to bupivacaine but has less cardiovascular and central nervous system toxicity as compared to bupivacaine and thus levobupivacaine has a greater safety margin than bupivacaine.[4] In our study, in group B, 66.7% were males and 33.3% were females, while in group L, 43.3% were males and 56.7% were females. Both groups were comparable (p>0.05).

The average age in group B was 31.17+/-8.00 years and in group L was 37.30 +/- 7.88 years. Both groups were comparable. (p value = 0.948).

The patients had weights in range of 50-70 kg. The mean weight in group B was 57.60+/-4.93 and in group L was 57.20+/-4.79 kg. Both groups were comparable (p value =0.751). Both groups were comparable with respect to diagnosis (p value = 0.879), tourniquet discomfort (p value=0.448), duration of surgery (p value=0.803). In the present study, onset of sensory block was 9.33+/- 3.27 min in-group B whereas it was 16.13+/- 2.83 min in-group L. This difference was statistically significant (p<0.0001). These findings correlate with the findings of Cenk Ilham, et al.[9] The sensory block onset time was 19.64+/-10.70 min in group B and 25.66+/-10.72 min in group L (p<0.036). However Jose Ricardo, et al found that there was earlier sensory block onset with levobupivacaine 0.5% as compared with bupivacaine 0.5% (p<0.05).[10] Faster onset of sensory block in levobupivacaine group was also found in the studies done by Fusun et al,[11] H.Evren et al,[12] Jyoti P Deshpande et al.[13] In the study done by Fusun and colleagues,[11] the patients were randomly allocated in two groups, group B (n=20) received 40 ml 0.375% bupivacaine + 2 mg morphine and group L (n=15) received 40 ml 0.375% levobupivacaine + 2 mg morphine. They found that the onset of sensory block was earlier with group L (9.66+/-2.52) than group B (13.40+/-2.76) which was statistically significant (p<0.0001). H. Evren et al divided the patients in two groups;[12] group B received 40 ml bupivacaine 0.25% and group L received 40 ml levobupivacaine 0.25%. There was a statistically significant earlier onset with levobupivacaine compared with bupivacaine (p= 0.002). Dr. Charu J Pandya and colleagues observed that the average sensory block onset time was less for levobupivacaine as compared with bupivacaine (10.5 min vs 18.7 min).[14] In the study done by Baskan et al,[15] patients were randomly given 40 ml of either 0.25% bupivacaine or 0.25% levobupivacaine. They observed that the onset time for sensory and motor blockade are statistically insignificant (p>0.05).

In the present study, onset of motor block was 12.17+/- 2.18 in group B whereas it was 20.00+/-2.79 in group L. This difference was statistically significant (p<0.0001). This means that the latency of motor blockade was more in the levobupivacaine group with earlier onset of motor blockade in the bupivacaine group. In both the groups there were no motor blockade as well as sensory blockade failure rates. Our findings were different from those of Jose Ricardo et al who reported that there was no statistically significant difference in the latency of motor blockade.[10] Our findings were consistent with Cenk Ilham et al who found that the motor block onset was statistically faster in group B (5.07+/- 4.07 min) than group L (9.2+/- 7.9 min).[9] Their findings were statistically significant. Dr Charu J Pandya and colleagues 14 observed that the onset of motor blockade was earlier with bupivacaine as compared to levobupivacaine.[14] Fusun et al observed that the motor block onset was earlier with levobupivacaine (6.40+/- 2.55 min) than bupivacaine (9.20+/- 1.73 min).[11] (p = 0.0001). Jyoti P Deshpande et al also observed a statistically significant earlier onset of motor block (p=0.001) in levobupivacaine (5.05+/- 0.29 min) as compared to bupivacaine (5.99+/- 0.49 min).[13] In the studies done by C.R.Cox et al,[16] Baskan et al,[15] H. Evren et al there was no statistically significant difference in the motor block onset times between the two groups.[12]

The quality of block in terms of anaesthesia and paralysis was comparable in both the groups (p>0.05). In this study, the duration of sensory block was 174.90+/-12.79 min in group B and in group L was 175.50+/-12.41 min. As this difference proved to be statistically insignificant (p>0.05), both bupivacaine and levobupivacaine had similar duration of sensory block. Fusun et al observed that the duration of sensory block was statistically more with bupivacaine+morphine group (1167.15+/-48.14 min) than with levobupivacaine+morphine group (1057.33+/-48.14 min) (p < 0.0001).[11] This was opposed to the findings of Jyoti P Deshpande and Dr Charu J Pandya.[13,14] Jyoti P Deshpande et al opined that the sensory block duration was more prolonged with levobupivacaine (1036.57+/-93.7 min) than bupivacaine (871.48+/-174.33 min) (p value= 0.001).[13] Dr Charu J Pandya and colleagues also had similar findings i.e. more duration of sensory block with levobupivacaine (630.96+/-95.22 min) as compared to bupivacaine (525.8+/-100.90 min).[14] (p<0.05). In the studies done by C.R.Cox et al,[16] Baskan et al,[15] H.Evren et al,[12] Cenk et al,[9] they observed no statistically significant difference in the sensory block duration between bupivacaine and levobupivacaine.

In the present study, the duration of motor block was similar in both the groups which was statistically insignificant (p=0.779); 165.16+/-15.93 min in the bupivacaine group and 164.00+/-16.16 min in the levobupivacaine group. Jyoti P Deshpande et al observed that the duration of motor block was more with levobupivacaine (1049.46+/-95.02 min) as compared to bupivacaine (902.37+/-181.46 min) (p = 0.001).[13] Our results matched with the results in the studies done by C.R.Cox et al,[16] Baskan et al,[15] H. Evren et al,[12] Cenk et al,[9] and Dr Charu J Pandya and colleagues,[14] They all found no statistically significant difference between the motor block duration of the two drugs.

Moreover, our result showed that sensory block tended to last longer as compared to motor block. The minimal effective concentration of local anaesthetic for large (motor) fibres is greater than for small (sensory) fibres. Thus, motor function returns before pain perception and hence duration of motor block was shorter than the sensory block. In the present study, the mean duration of post operative

analgesia was statistically insignificant between the two groups. (p=0.766). It was 193.56+/-23.51 in group B and 192.83+/-23.54 in group L. Cenk et al found statistically insignificant difference in the post operative analgesia between the two drugs.[9] Jyoti P Deshpande et al observed that the duration of analgesia was longer with levobupivacaine (1048.32+/-97.24 min) whereas for bupivacaine it was 900.41+/-177.74 min. (p=0.001).[13] Dr Charu J Pandya et al[14] also found levobupivacaine had more analgesic effect as compared to bupivacaine (p<0.05). The mean of the total duration of analgesia in group B (622.16+/-103.80 min) was less than in group L (781.43+/-96.22 min).

In the present study, the comparison of VAS score (p=0.904) showed statistically insignificant results. The number of patients who required rescue analgesia and the mean number of supplemental analgesic required were also statistically insignificant between the two groups (p=0.432).

The pulse rate in both the groups was found to be statistically insignificant (p>0.05) at all time intervals.

Similarly, statistically insignificant difference was observed in the mean arterial pressure (MAP) of bupivacaine and levobupivacaine groups (p>0.05)

The respiratory rate and percentage of oxygen saturation were found to be comparable in both the groups. (p>0.05)

A. Cacciapuoti et al in their study on 45 patients who received either 0.5% bupivacaine or 0.5% levobupivacaine or 0.75% ropivacaine in axillary brachial plexus block observed two episodes of reduction in heart rate without significant hypotension in the patients who received racemic bupivacaine.[17] This was found to be statistically non significant.

In the studies done by C.R.Cox,[16] Jose Ricardo,[10] Fusun,[11] Dr Charu J Pandya,[14] Hetal Rathod,[18] no statistically significant difference was observed in the hemodynamic parameters.

Among the patients, 5 (16.7%) patients in group B had tourniquet pain while 3(10.0%) patients in group L had tourniquet discomfort. No statistically significant difference was found (p-value=0.448). The most common side effect in our study was nausea, vomiting and sedation, the incidence of which was comparable in both the groups.

The major limitation of our study was that we did not use ultrasound guided blocks because of unavailability at the time of our study, this could have helped us to lower dosage and volume of local anaesthetic. Though our results tend to suggest that levobupivacaine is a longer acting local anaesthetic with similar block quality and prolonged effect as that of bupivacaine, to obtain a definite result, study with enrolment of larger number of patients is required. Moreover, we included only patients with ASA I and II physical status only, a study of high risk patients to justify the safety of levobupivacaine has to be carried out.

CONCLUSION

After analyzing the results of the present study, the following conclusions were drawn

There was significant difference in onset of sensory and motor block. Mean onset of sensory and motor block in group B was rapid than group L. Mean onset of sensory block in group B was 9.33 min whereas mean onset of motor block in group B was 12.17 min, both of which was earlier in group B than group L.

- The duration of sensory and motor blockade was similar with both the drugs.
- The quality of sensory block was comparable in both the groups.
- Both bupivacaine and levobupivacaine provided comparable degree of motor block in supraclavicular brachial plexus block.
- The duration of postoperative analgesia was comparable in both groups.
- Mean duration of postoperative analgesia in group Bupivacaine was 3.22 hrs (193.56 mins), while the duration was 3.21 hrs (192.83 mins) in case of group Levobupivacaine which was statistically and clinically non significant.
- The requirement of analgesics in the post operative period was similar with bupivacaine and levobupivacaine.
- There were no significant differences in hemodynamic changes between 2 groups.
- No any intra or postoperative complication was noted in both groups.
- On evaluation of quality of block by patients and surgeons, both found no significant difference between the block provided by the 2 drugs.
- We concluded that 30 ml of 0.5% bupivacaine and levobupivacaine was enough to achieve adequate motor and sensory supraclavicular block.

Levobupivacaine has theoretical advantage of having less toxicity potential and being less cardiotoxic than bupivacaine. So it may be a safer drug in supraclavicular brachial plexus block; where accidental intravascular injection of large volume of local anaesthetic can occur and may be more detrimental especially in patients with cardiac disease.

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