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Original Research Article

Comparative Study of Two Different Local Anaesthetic Agents – 0.5 % Bupivacaine and 0.5% Ropivacaine for Ultrasound Guided Supraclavicular Brachial Plexus Block for Upper Limb Surgery

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Abstract:

Background: Ultrasound-guided supraclavicular brachial plexus block is widely used for upper limb surgeries due to its effectiveness in providing perioperative anaesthesia and postoperative analgesia while avoiding the adverse effects associated with general anaesthesia. Among the commonly used local anaesthetic agents, bupivacaine provides prolonged sensory and motor blockade, whereas ropivacaine offers a favourable safety profile with reduced cardiotoxicity.

Objective: To compare the efficacy of 0.5% bupivacaine and 0.5% ropivacaine for ultrasound-guided supraclavicular brachial plexus block in patients undergoing upper limb surgery.

Methods: 60 ASA I and II patients of both genders, aged 20 to 60 years, posted for upper limb surgery were randomised: Patients in Group B received 20 mL of 0.5% bupivacaine, whereas patients in Group R received 20 mL of 0.5% ropivacaine. Sensory and motor block characteristics, duration of analgesia, haemodynamic parameters, and perioperative complications were assessed and compared between the groups. Postoperative pain was evaluated using the Visual Analogue Scale, and rescue analgesia was administered when VAS score exceeded 3. Statistical analysis was performed using SPSS version 25.0. Data were analyzed using Independent t-test, Mann–Whitney test, Chi-square test, and Fisher's exact test, with $p < 0.05$ considered statistically significant.

Results: The onset times of sensory and motor blockade were significantly longer in Group R than in Group B ($p < 0.001$), whereas the durations of sensory and motor blockade were significantly prolonged in Group B compared to Group R ($p < 0.001$). No significant intergroup differences were observed with respect to haemodynamic parameters or adverse effects.

Conclusion: At equal volumes and concentrations, 0.5% bupivacaine provided an earlier onset of sensory and motor blockade, along with prolonged motor blockade and postoperative analgesia, compared to 0.5% ropivacaine. Both agents demonstrated stable perioperative haemodynamic profiles without significant adverse effects.

Keywords: Bupivacaine, Ropivacaine, Brachial Plexus Block, Upper Limb and Surgery.

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Introduction

Peripheral nerve blocks have gained popularity in clinical practice because they avoid risks and adverse effects of general anaesthesia. It has been found to be relatively economical as compared to general anaesthesia due to early mobilization and reduced hospital stay. [1]

Patients with comorbidities such as cardiovascular diseases, chronic lung disease, metabolic diseases, neuropathies and immunosuppressive states, when undergoing general anaesthesia, face challenges like changes in hemodynamic stress response and potential for drug interaction due to polypharmacy. These patients would benefit from regional anaesthesia, especially for limb surgeries. The brachial plexus block can be administered through various approaches, including interscalene, supraclavicular,

infraclavicular, and axillary techniques.[2] Supraclavicular approach is the easiest and most consistent method for surgery below the shoulder joint.[3]

The first percutaneous supraclavicular block was performed by Kulenkampff in Germany in 1911. [4] All these approaches of brachial plexus blocks have been successfully used for upper limb surgery but supraclavicular nerve block seems to be the most convenient and safe method for perioperative pain management in surgeries below the shoulder joint. The Supraclavicular approach has the additional anatomical advantage of blockade at a level where the brachial plexus is tightly encased,[5] which facilitates a single point injection and is believed to result in very rapid onset. [6] Supraclavicular brachial plexus block may be performed using landmark-based techniques, peripheral nerve stimulation, ultrasonography, or a combination of ultrasound and nerve stimulation.

Regional anaesthesia can be a good alternative to general anaesthesia with the advent of devices such as peripheral nerve stimulator and ultrasound. The original blind technique has several disadvantages like multiple attempts, arterial puncture, nerve injury and inadvertent pleural puncture. These disadvantages of a block by a blind technique have been overcome with the usage of nerve stimulator and ultrasonology.

Earlier the peripheral nerve stimulator (PNS) was used to locate the nerves using a low-intensity electric current for a short-duration with an insulated needle to obtain a defined response of muscle twitch followed by injecting local anaesthetic solution in close proximity to the nerve [7] but the neuronal sparing which was seen with this technique was probably due to non-uniform distribution of sensory and motor fascicles in a compound nerve. This meant that the technique was relatively insensitive but very specific.

Ultrasound guidance allows direct visualisation of the brachial plexus, needle trajectory, targeted and focused installation of the local anaesthetic agents, thereby improving block success rates, reducing procedure time, minimising drug volume, and lowering complication rates.

Bupivacaine is one of the most frequently used local anaesthetic agent for supraclavicular block as it has long duration of action. [8] It is an amide local anaesthetic agent commonly used as local anaesthetic agent for peripheral nerve blocks because of its high quality sensory and motor blockade and longer duration of action. Ropivacaine, a propyl derivative of bupivacaine with a good nerve blocking potential along with a reduced cardiac toxicity.

The purpose of this study is to use ultrasound guided technique of brachial plexus block enabling lower volume of same concentration of these two local anaesthetic agents, ropivacaine and bupivacaine and thereafter comparing their effect.

Methods

This investigation was conducted within the Department of Anaesthesiology, Deen Dayal Upadhyay Hospital, Hari Nagar, New Delhi, with approval from the Institutional Ethics Committee. All participants gave written informed consent.

A separate anaesthesiologist, who was not involved in data collection or patient care, prepared the study drugs. The drugs were administered according to a computer-generated randomisation list, with group assignments concealed using opaque, sealed envelopes.

Sixty consenting patients of both genders, aged 20–60 years, classified as ASA I–II and scheduled for upper limb surgery below the elbow under brachial plexus block participated in the study. Patients with uncontrolled hepatic, renal, or cardiac disorders were excluded from the study. The materials required for the study included an anaesthesia workstation with standard monitoring equipment, a resuscitation trolley equipped with airway devices, laryngoscope, and appropriately sized endotracheal tubes, sterile gloves, disposable syringes and needles, intravenous cannulas and fluids, povidone-iodine and spirit for aseptic preparation, sponge-holding forceps, emergency medications, and an ultrasound machine. The drugs used during the study included 0.5% bupivacaine hydrochloride, 0.5% ropivacaine, and intravenous midazolam. A comprehensive history was taken from all cases followed by thorough general physical and systemic examination. All investigations of the patients were done as per indications. Eligible participants were allocated into two groups: Group B received 20 mL of 0.5% bupivacaine, while Group R received 20 mL of 0.5% ropivacaine for ultrasound-guided supraclavicular brachial plexus block. All the patients were prescribed 0.5mg of Alprazolam and 150mg of ranitidine orally to be taken on the night before surgery. Patients were advised to be nil orally from 10pm onward on the night before surgery.

Ensured overnight NPO status, on arrival in the OT, then the patient was made to lie in supine position on the OT table and. Standard monitors that include ECG, non-invasive blood pressure and pulse oximeter were applied. Baseline readings of heart rate, blood pressure (systolic, diastolic and mean) and oxygen saturation were noted. Vascular access was secured using 18-gauge intravenous cannula. Oxygen was given at 6L\min through an oxygen mask.

Premedication which included injection Midazolam 0.04mg/kg iv was administered. Under strict aseptic precautions supraclavicular brachial plexus block was performed by ultrasound guided approach after

visualization of the Sono anatomy of the brachial plexus, dynamic needle movement was done till the tip of the needle approached the bunch of grapelike structure and following negative aspiration for blood, first 2ml of NS was injected to confirm the position of needle, then drug solution was injected around the brachial plexus. The onset and duration of sensory and motor blockade were noted.

Onset of Sensory Block was assessed from the end time of the local anaesthetic administration and establishment of score 2 on 3-point scale at all dermatome levels. Sensory block was assessed by pinprick at all dermatomes using the blunt end of a 27-gauge needle starting from 5 minutes and thereafter every 5 minutes till 30 minute or till sensory block was achieved, whichever was earlier.

Sensory blockade was assessed using a three-point scale.[9] A score of 0 indicated sharp pain on pinprick, a score of 1 indicated dull pain sensation (analgesia), and a score of 2 indicated complete absence of pain perception to pinprick (anaesthesia).

Onset of Motor Block was assessed from the interval of the administration of local anaesthetic to the absence of voluntary hand and forearm movements i.e., score 2 on Modified Bromage Scale.

Motor block was measured starting from 5 minute and thereafter every 5 minutes till 30 minute or till motor block was achieved whichever was earlier.

Motor block was assessed using the Modified Bromage Scale [10], where Grade 0 represented normal motor function with preserved flexion and extension of the elbow, wrist, and fingers. Grade 1 indicated partial motor blockade with reduced muscle strength, allowing movement of the fingers only, while Grade 2 denoted complete motor blockade characterised by the inability to move the fingers. (Flexion at the elbow -musculocutaneous nerve, thumb abduction- radial nerve, thumb adduction- ulnar nerve, wrist flexion-median nerve)

If after 20 minutes of administering the supraclavicular block, the desired sensory and motor blockade was not achieved at the dermatome levels required for the particular surgery, General Anaesthesia (GA) was administered to the patient. Patients having an inadequate block (sensory block score less than 2 on a 3-point scale) was supplemented with General Anaesthesia.

Duration of Sensory Block: The duration of sensory block defined as the time interval between the end of local anaesthetic administration and the complete resolution of anaesthesia (score 0 on a 3-point scale). Patients were assessed at 0hr, 1hr, 2 hr, 4hr, 6hr, 12hr, 18hr, and 24hr hours for pin prick sensation.

Duration of Motor Block: The duration of a motor block was defined as the time interval between the end of local anaesthetic administration and the recovery of complete motor function of the hand and forearm (score 0 on the Modified Bromage Score). It was assessed and documented at 0hr, 1hr, 2hr ,4hr ,6hr ,12hr ,18hr ,24 hours by asking the patient to move their fingers and see if they are able to raise their hand or not.

Duration of Analgesia: The duration of analgesia was taken from the time of onset of block to the first complaint of pain i.e., VAS $\geq$ 3. The time to first analgesic use and total need for analgesics was recorded during the postoperative 24 hours period. Visual Analogue Scale (VAS) score for postoperative pain was noted in the postoperative period at intervals of at 0minute, 30minutes,1hr,2hr,4hr,4.5hr,5hr,5.5hr,6hr,6.5hr,12 hr,18 hr and 24 hours.0 was considered no pain and 10 was considered 'worst imaginable pain'. VAS $\geq$ 3 was considered for rescue analgesia with IV Diclofenac 75 mg was administered and the time noted.

Monitoring of Haemodynamic Parameters: The patients were monitored throughout the surgery and postoperatively. HR, SBP, DBP, Mean BP and Spo2 values were recorded pre op at 0minute,5min,10min, 20min,30min, 45min, 60min, 75min, 90min, 2hrs, 2.5hrs, 3 hrs intraoperatively and 0minute,30minute,1hr,2hr,4hr,6hr,12hr,18hr,24 hrs postoperatively.

Intraoperative and Postoperative Complications: The observation was made for episodes of perioperative hypotension (a 20% decrease from the baseline value), bradycardia (HR<60beats/min), hypoxemia (SpO2<90%), nausea/vomiting, pruritus, shivering, drowsiness, vascular puncture, pneumothorax, respiratory depression and sign and symptoms for local anaesthetic toxicity were recorded and managed accordingly

Statistical analysis: The presentation of the Categorical variables was done in the form of number and percentage (%). On the other hand, the quantitative data were presented as the means ± SD and as median with 25th and 75th percentiles (interquartile range). The data normality was checked by using Shapiro-Wilk test. The cases in which the data was not normal, we used non parametric tests. The following statistical tests were applied for the results:

1. The comparison of the variables which were quantitative and not normally distributed in nature were analyzed using Mann-Whitney Test and variables which were quantitative and normally distributed in nature were analyzed using independent t test.
2. The comparison of the variables which were qualitative in nature were analyzed using Chi-Square test. If any cell had an expected value of less than 5 then Fisher's exact test was used.

The data entry was done in the Microsoft EXCEL spreadsheet and the final analysis was done with the use of Statistical Package for Social Sciences (SPSS) software, IBM manufacturer, Chicago, USA, version 25.0.

For statistical significance, p value of less than 0.05 was considered statistically significant.

Results

Baseline demographic and clinical characteristics are presented in Table 1. Both Group R and Group B comprised 30 patients each, with a male predominance (73.33% in Group R vs 60.00% in Group B). The groups did not differ significantly in mean age (36.00 ± 11.27 vs 37.73 ± 10.63 years; p = 0.542), gender distribution (p = 0.273), or ASA grade (p = 0.292). The distribution of patients across the different age groups was also comparable between the two groups (p = 0.662).

Table 1: Comparison of demographic characteristics between group R and B.

Demographic characteristics	Group R(n=30)	Group B(n=30)	Total	P value
Age				
20 to 30 years	8 (26.67%)	9 (30%)	17 (28.33%)	0.662*
31 to 40 years	13 (43.33%)	9 (30%)	22 (36.67%)	
41 to 50 years	5 (16.67%)	8 (26.67%)	13 (21.67%)	
51 to 60 years	4 (13.33%)	4 (13.33%)	8 (13.33%)	
Mean ± SD	36 ± 11.27	37.73 ± 10.63	36.87 ± 10.9	0.542‡
Median(25th-75th percentile)	35.5(30.25-43.5)	35.5(28.5-44.75)	35.5(29.5-44.25)	
Range	20-58	22-58	20-58	
Gender				
Female	8 (26.67%)	12 (40%)	20 (33.33%)	0.273†
Male	22 (73.33%)	18 (60%)	40 (66.67%)	
ASA grade				
1	20 (66.67%)	16 (53.33%)	36 (60%)	0.292†
2	10 (33.33%)	14 (46.67%)	24 (40%)	

‡ Independent t test, * Fisher's exact test, † Chi square test

The onset of sensory block was significantly longer in Group R than in Group B (21.33 ± 0.71 vs 18.47 ± 0.86 minutes; p < 0.001) (Table 2)

Table 2 - Comparison of onset of sensory block(minutes) between group R and B.

Onset of sensory block(minutes)	Group R(n=30)	Group B(n=30)	Total	P value
Mean ± SD	21.33 ± 0.71	18.47 ± 0.86	19.9 ± 1.64	<.001‡
Median(25th-75th percentile)	21(21-22)	18(18-19)	20(18-21)	
Range	20-22	17-20	17-22	

‡ Independent t test

The duration of sensory block was significantly longer in Group B than in Group R (363.13 ± 9.13 vs 330.57 ± 17.74 minutes; p < 0.001) (Table 3).

Table 3: Comparison of duration of sensory block(minutes) between group R and B.

Duration of sensory block(minutes)	Group R(n=30)	Group B(n=30)	Total	P value
Mean ± SD	330.57 ± 17.74	363.13 ± 9.13	346.85 ± 21.57	<.001‡
Median(25th-75th percentile)	326(316-346)	365.5(358-368.75)	350(327-366)	
Range	308-368	342-379	308-379	

‡ Independent t test

The onset of motor block was significantly longer in Group R than in Group B (27.33 ± 1.18 vs 26.23 ± 0.82 minutes; p < 0.001) (Table 4).

Table 4: -Comparison of onset of motor block(minutes) between group R and B.

Onset of motor block (minutes)	Group R(n=30)	Group B(n=30)	Total	P value
Mean ± SD	27.33 ± 1.18	26.23 ± 0.82	26.78 ± 1.15	0.0001‡
Median(25th-75th percentile)	27(26-28)	26(26-27)	27(26-27.25)	
Range	26-30	25-28	25-30	

‡ Independent t test

The duration of motor block was significantly longer in Group B than in Group R (382.17 ± 10.00 vs 350.43 ± 14.40 minutes; p < 0.001) (Table 5).

Table 5: Comparison of duration of motor block(minutes) between group R and B.

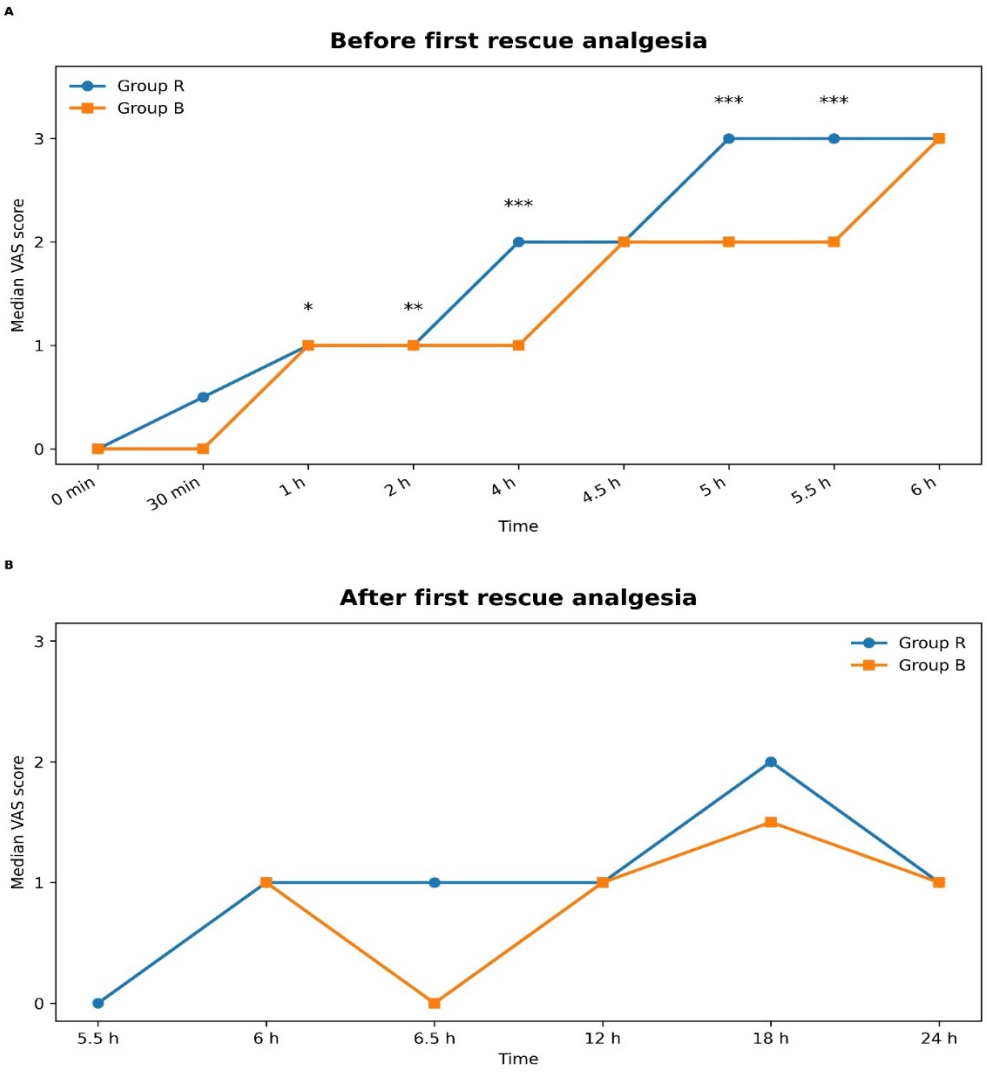
Duration of motor block(minutes)	Group R(n=30)	Group B(n=30)	Total	P value
Mean ± SD	350.43 ± 14.4	382.17 ± 10	366.3 ± 20.18	<.001‡
Median(25th-75th percentile)	344(340-364)	383(374-388)	368(345-381.5)	
Range	330-378	362-398	330-398	

‡ **Independent t test**

Haemodynamic parameters, including heart rate, systolic and diastolic blood pressure, mean arterial pressure and SpO_2, remained comparable between the two groups throughout the intraoperative and postoperative periods, with no statistically significant differences observed at any of the assessed time points ($p > 0.05$).

Pre-rescue VAS scores were comparable between the two groups at 0 minute, 30 minutes, 4.5 hours and 6 hours ($p > 0.05$). However, Group R had significantly higher median VAS scores than Group B at 1 hour [1 (1–1) vs 1 (0–1); $p = 0.010$], 2 hours [1 (1–2) vs 1 (1–1); $p = 0.001$], 4 hours [2 (2–2) vs 1 (1–2); $p < 0.001$], 5 hours [3 (2–3) vs 2 (2–2); $p < 0.001$], and 5.5 hours [3 (3–3) vs 2 (2–2); $p < 0.001$] (Figure 1A). Following rescue analgesia, median VAS scores were comparable between Group R and Group B at 6, 6.5, 12, 18 and 24 hours, with no statistically significant differences observed ($p > 0.05$) (Figure 1B).

Figure 1: Comparison of Visual Analogue Scale (VAS) scores between Group R and Group B. (A) Median VAS scores before first rescue analgesia. (B) Median VAS scores after first rescue analgesia. *p < 0.05, **p ≤ 0.01, ***p ≤ 0.001.



The time to first rescue analgesia was significantly longer in Group B than in Group R (5.97 ± 0.13 vs 5.25 ± 0.31 hours; $p < 0.001$). However, the total analgesic requirement during the first 24 hours was

comparable between Group R and Group B (112.50 ± 38.14 vs 110.00 ± 38.06; p = 0.800) (Table 6).

Table 6: Comparison of postoperative analgesic requirements between Group R and Group B

Parameter	Group R (n = 30)	Group B (n = 30)	p-value
Time to first rescue analgesia (h), mean ± SD	5.25 ± 0.31	5.97 ± 0.13	<0.001
Total analgesic requirement in 24 h, mean ± SD	112.50 ± 38.14	110.00 ± 38.06	0.800

Data are presented as mean ± SD. p-values were calculated using the independent t-test.

No complications were observed in Group R, whereas nausea occurred in 4 patients (13.33%) in Group B; however, the difference was not statistically significant (p = 0.112).

Discussion

Brachial plexus block has remained the principal mode of anaesthesia for upper limb surgery since decades. The blind technique gradually got replaced by the use of nerve stimulation which again had its own share of failures and disadvantages. Ever since the first use of ultrasound for nerve blocks in 1978, [11] the technique has been repeatedly assessed using various drugs with respect to their concentration, volume and with or without adjuvants.

Our study is a prospective randomized comparative study of two different local anesthetic drugs 20 ml 0.5% Ropivacaine and 20 ml 0.5% Bupivacaine in ultrasound guided brachial plexus block of upper limb surgeries. The study included 60 patients coming for upper limb surgeries, who were randomized in two groups of 30 patients each. Group R patients were given 20 ml 0.5% Ropivacaine in and Group B given 20 ml 0.5% Bupivacaine in ultrasound guided upper limb surgeries.

In the present study ultrasound guided technique was chosen for administering supraclavicular brachial plexus block as it offers many advantages over the conventional technique of nerve stimulation and paraesthesia like, providing a direct visualization of the anatomical structures, dynamic vision of the needle advancement and local anaesthetic spread around the nerve roots. It has also been shown to reduce the number of needles passes or redirections needed to perform the block, provide enhanced sensory and motor blocks, allow shorter procedure times with negligible vascular punctures. The technique is also considered to be superior when compared to the nerve stimulation technique.

A volume of 20ml of 0.5% of ropivacaine was used by Usha et al. [12] where they have used ultrasound for giving the block. So, from above studies it was concluded that the volume of 0.5% ropivacaine and 0.5% bupivacaine required for ultrasound guided supraclavicular brachial plexus block was 20ml.Our study was also designed on similar volume of 20 ml of 0.5% ropivacaine and 0.5% bupivacaine.

Statistical analysis of the demographic profile of the patients accepted in both the groups were found to be comparable and was statistically insignificant. The patients were comparable on the basis of ASA grading and duration of surgery.

In our study, we observed that onset time of sensory block was earlier in Bupivacaine group (Group B) having a mean value of 18.47±0.86 minutes in comparison with Ropivacaine group (Group R) having a mean value of 21.33±0.71 minutes. The difference between the two groups in terms of sensory block onset was statistically significant. p value <0.001. These results were comparable with those obtained in the studies conducted by D Tripathi et al., Singelyn FJ et al. [13,14]

Another study done by Hickey. R et al found no significant difference in onset of sensory block between groups received 0.5% ropivacaine or group received 0.5% bupivacaine. [15]

In our study, we observed that onset time of Motor block was earlier in Bupivacaine group (Group B) having a mean value of 26.23±0.82 minutes in comparison with Ropivacaine group (Group R) having a mean value of 27.33±1.18 minutes. The difference between the two groups in terms of motor block onset was statistically significant. p value<0.001. These results were similar with those obtained in the studies conducted by D Tripathi et al., Singelyn FJ et al. [13,14]

Another study done by Hickey et al, [15] found a similar onset time for motor block between 0.5% ropivacaine and 0.5% bupivacaine.

The Duration of Motor block was 382.17±10 minutes with Bupivacaine group and 350.43±14.4 minutes with Ropivacaine group. The duration of Motor block was longer in Bupivacaine group compared with Ropivacaine group. The difference between the two groups was statistically significant. p value<0.001. These results were similar with those obtained in the studies conducted by Mcglade D.Pet al., Hickey R, et al. [16,17]

However, studies done by Hickey et al showed similar duration of block between the two group. [15] The reduced intensity and quicker recovery of motor block with ropivacaine in comparison to bupivacaine has been repeatedly proven by many authors. [18] The lesser motor blockade of ropivacaine in comparison to bupivacaine can be explained by its lesser lipid solubility and myelin sheath penetration,

thereby causing selective action on A-delta and C fibres that carry pain rather than A-beta fibres which are involved in motor function.[19] This greater degree of differential block with ropivacaine at low concentrations has a clinical advantage in surgeries which needs minimal motor block. This property of ropivacaine holds definitive advantage in situations like labour analgesia and postoperative pain management where early ambulation is desirable.[20]

In our study most of the patients in Group R attained a VAS Score of 3 at 5 hours, while in Group B a VAS Score of 3 was attained at 6 hours in most of the patients, thus making the duration of analgesia statistically significant. Bupivacaine was found to provide better analgesia than Ropivacaine. These results were similar with those obtained in the studies conducted by McGlade D.P et al., Hickey. R, Rowley. C.L, et al. [16,17]

The duration of analgesia was taken as the time interval between the administration of block till the first dose of diclofenac(75mg) given intravenously when the VAS score was more than or equal to 3.

In our study duration of analgesia lasted for 5.97±0.13 hours with Bupivacaine group (Group B) and 5.25±0.13 minutes with Ropivacaine group (Group R) with the difference between the two groups was statistically significant P value< 0.001. These results were similar with those obtained in the studies conducted by McGlade D.P et al., Hickey. R, Rowley. C.L, et al. [16,17]

Hickey et al [15] found that 0.5% bupivacaine and 0.5% ropivacaine had an average duration of sensory block of 9-11 hrs. The probable reason for these variations in duration of sensory blockade was due to different parameters deciding the duration.

We, therefore, concluded that both the groups provided analgesia for a duration of 5-6 hrs. The postoperative VAS scores were similar in these groups except for the reading at 5.5 hours in ropivacaine 0.5% and bupivacaine 0.5% which imply that the analgesic requirement was earlier in ropivacaine 0.5% than bupivacaine 0.5%.

Total analgesic requirement patients were given rescue analgesia at a VAS Score of equal to or more than 3. The amount of diclofenac requirement postoperatively was noted which revealed higher requirement in 0.5% ropivacaine group than 0.5% bupivacaine which was not significant.

Post block hemodynamic parameters like pulse rate, systolic, diastolic and mean arterial pressures were within normal limits in both the groups requiring no intervention.

No major block-related complications were observed in either group. Nausea occurred in 4 patients (13.33%) in Group B and none in Group R; however, the difference was not statistically significant ($p = 0.112$). No other significant adverse effects such as vomiting, haematoma formation and bruising were observed between the groups.

The present study has certain limitations. It was conducted at a single centre with a relatively small sample size, which may limit the generalizability of the findings. Additionally, a single-point injection technique was used for the supraclavicular brachial plexus block, which may be associated with ulnar sparing compared with a double-point injection technique. Furthermore, the volume of local anaesthetic used was relatively higher than the lower volumes that may be sufficient with ultrasound guidance. Larger multicentric studies using lower drug volumes and alternative injection techniques are warranted to validate these findings.

Conclusion

After analysing the results of our study, it can be concluded that supraclavicular brachial plexus block under ultrasound guidance is a far superior technique as it gives a targeted approach allowing adequate anaesthesia while using a much lower dose as compared to the higher volumes used in other methods.

On comparing equivalent doses of Bupivacaine and Ropivacaine we concluded that, Bupivacaine 0.5% has early onset of sensory blockade, early onset of motor blockade, prolonged duration of motor blockade, prolonged duration of analgesia when compared to Ropivacaine 0.5% at equal volumes. Both the drugs maintain stable hemodynamic profile perioperatively and are devoid of any side effects at the concentration and volumes used for the study.

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