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A Comparative Study of Quality of Ultrasound Guided Supraclavicular and Infraclavicular Blocks for Upper Limb Surgery

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ABSTRACT

Introduction: Ultrasound-guided supraclavicular and infraclavicular brachial plexus blocks are commonly used for upper extremity surgery. Infraclavicular block appears to have a better quality of block and less side effects.
Aim: To compare efficacy of ultrasound guided Supraclavicular and Infraclavicular brachial blocks for upper limb surgery using Ropivacaine 0.5%.
Method: 120 male and female patients aged 18-80 years; of ASA 1 & 2 undergoing upper limb surgery under ultrasound guided Supraclavicular or Infraclavicular blocks were randomized in 2 groups (60 each). Under standard monitoring brachial block was administered to all patients. Group S received ultrasound guided supraclavicular and group I received infraclavicular brachial plexus blocks using Ropivacaine 0.5%, making up to a volume of 0.5 ml/kg (Maximum volume 40ml, Maximum dose-3mg/kg). Hemodynamic parameter, quality and duration of sensory and motor blockade, duration of analgesia, VAS score, side effects (pneumothorax, accidental vascular puncture, suspected diaphragmatic paresis and Horner's syndrome) were noted at specified intervals.
Results: Demographic variables, duration and type of surgery, hemodynamic parameter, respiratory parameters, block performance time and block performance related pain were comparable at all time interval between two groups. In I group higher proportion of patient achieved sensory and motor block of ulnar ($p<0.05$) and median nerve at 30 minute after completion of block than S group. More patient in I group was ready for surgery at 30 minute than S group. More patients in S group required surgical anesthesia supplementation than I group ($p<0.05$). Regarding duration of sensory block, motor block and duration of analgesia, USG guided supraclavicular block was superior. More patients of Group S suffered side effects than group I.
Conclusion: Compared to USG guided supraclavicular block, Ultrasound-guided infraclavicular brachial plexus block provides superior surgical anesthesia with less side effects but with less duration of analgesia.

Keywords: Supraclavicular block, Infraclavicular Block, Ropivacaine

INTRODUCTION

Many millions of patients worldwide undergo surgery every day and effective pain control in the perioperative period is essential for optimal care of such patients. Regional nerve block avoids the unwanted effects of anesthetic drugs used during general anesthesia and laryngoscopic stress response.

Regional anesthesia like brachial plexus block is only successful when local anesthetic is deposited in close proximity to the targeted nerves. There have been several techniques for correct placement of local anesthetic, including paresthesia-seeking, peripheral nerve stimulator, and most recently ultrasound guidance[1].

Ultrasound imaging in supraclavicular brachial plexus block helps to avoid critical structures like subclavian artery and pleura[2]and enable the anaesthesiologist to secure an accurate needle positioning, monitor the distribution

of the local anaesthetic in real time, with the potential advantage of improving the quality, shortening onset, and reducing the minimum volume required to obtain a successful nerve block [3].

However, the major disadvantages in this approach are inadvertent vascular injections, pneumothorax, phrenic nerve palsy and Horner's syndrome.

Brachial plexus block in the infraclavicular approach offers the advantages of avoiding pneumothorax while affording block of the musculocutaneous and axillary nerves. No special arm positioning is required. A nerve stimulator or ultrasound visualization is required because there are no palpable vascular landmarks to aid in directing the needle[1].

The introduction of ultrasonography has increased the interest in infraclavicular block. The main advantage of infraclavicular block is the fewer incidences of complications with ultrasound. The disadvantage is that plexus is situated deeper at this level and the angle of approach is more acute making synchronised visualisation of the relevant anatomy and needle challenging in inexperienced hands specially in obese patients[4].

The advent of ultrasonography has inherent benefits of direct visualisation of nerves and surrounding anatomy, continual observation of the needle tip and spread of local anaesthetic makes ultrasound-guided regional anaesthesia highly appealing.

In this context the present study has been undertaken to compare ultrasound guided infraclavicular and supraclavicular approaches of brachial plexus block for the block performance times (interval between the first needle insertion and its removal at the end of the block), Quality of sensory and motor block, duration of analgesia and safety of both approaches using ropivacaine.

MATERIALS AND METHODS

This comparative study was conducted with 120 ASA Class I and II of either sex, male and female patients of 18-80 years of age who underwent upper limb surgeries (elbow, forearm and hand surgery) under brachial plexus block. The study protocol was reviewed and approved by the hospital ethical committee and a written informed consent was obtained from each and every patient recruited in this study. Each group consists of 60 patients. Group S received USG guided supraclavicular block and Group I received USG guided infraclavicular block.

Exclusion criteria were unwilling patients, coagulopathy, infection at the injection site, allergy to drugs under study, severe pulmonary pathology, age <18 yrs and >80 yrs, body mass index more than 35, preexisting motor or sensory deficit in the operative limb, chronic renal or liver disease, Pregnancy, Failed block requiring general anesthesia or failed to obtain proper image of brachial plexus after 20 minutes of ultrasonography scanning. Each of the patients selected for the study was examined on the day before surgery, was counselled and written informed consent was taken.

The procedures were carried out in the operating theatre of Ramakrishna Mission Seva Pratishthan. 120 patients was randomized into supraclavicular (S) or the infraclavicular (I) group using computer generated random numbers. Visual Analogue Scale (VAS) was explained to every patient.

Routine anxiolysis with 0.25mg Alprazolam was given on the night before surgery. Fasting was ensured as par standard ASA guidelines.

After coming to operating theatre, standard ASA monitors were connected and baseline parameters were recorded. Intravenous access secured.

Both block was performed using Ropivacaine 0.5% making upto a volume of 0.5 ml/kg (Maximum volume 40ml, Maximum dose up to 3mg/kg).

A LOGIQe ultrasound machine equipped with a linear probe 8-13 MHz probe (12L-RS)[5], cross beam imaging capability and a colour Doppler was used for all patients. An exploratory scan was

performed in each patient before the block, by positioning the probe in a coronal oblique plane above the clavicle (S group) or the parasagittal plane below the clavicle (I group). The frequency was set to 10MHz. The targets were: the plexus trunks/divisions in the S group and the axillary artery in the I group.

Position of the patient was supine with head rotated to the contralateral side. The upper limb to be anesthetized was adducted and extended along the side toward the ipsilateral knee as far as possible. After Antiseptic dressing and draping Ultrasound probe was covered by sterile probe cover and sterile gel was used. After anaesthetizing the skin and the subcutaneous tissue with 2-4 ml of lignocaine 20 mg/ml, a 25G, Quinke's needle was inserted under the probe's long axis (in plane).

In the S group, the first half of the LA volume was injected superficial to the plexus and the remaining volume was injected after repositioning the needle tip to obtain a full circumferential LA spread around the nerves.

In the I group, the first half of the volume was injected posterior to the artery and the second half after repositioning the tip to obtain a posterolatero-medial, U-shaped LA spread. The end of the injection is defined as time 'zero'. The time from the first insertion of the needle to its removal (block performance time) was recorded by an independent observer.

Block performance-related pain was evaluated immediately after removal of the needle by Visual analogue scale for level of pain during the procedure by an independent observer.

SBP, DBP, MAP, heart rate and SPO_2 were recorded at 0, 1, 3, 5, 10, 15, 20& 30mins after brachial plexus block.

Sensory blockade was assessed by touch and needle (25G) prick test in all the 4 nerve areas i.e. lateral side of the forearm for musculocutaneous nerve; lateral side of the palm, thumb, second and third finger for median nerve; medial side of the palm and the dorsum of the hand, fourth and fifth finger for ulnar nerve; lateral side of the dorsum of the hand for radial nerve, every 10 mins until 30 mins. Failed block was considered if analgesia was not present in 4 peripheral nerve distributions and such patients were excluded from the study.

The quality of the sensory block to be quantified using the following scoring system[1]:

ANESTHESIA (NO PAIN AND TOUCH) → 2
ANALGESIA (NO PAIN BUT TOUCH PRESENT) → 1
PAIN → 0

If 20 min elapsed without obtaining a proper image of the target, the procedure was abandoned.

Duration of sensory block was defined as the time interval between the onset of sensory block of all four nerve (anesthesia, score-2) and complaining of first postoperative pain.

Motor block was assessed by loss of thumb adduction for ulnar nerve; thumb abduction for radial nerve; thumb opposition for median nerve; flexion of the elbow and pronation of forearm for musculocutaneous nerve at 30 minutes after completion of block.

Motor block was graded according to modified Bromage scale for upper extremities on a 3-point scale:

Grade 0: Normal motor function with full flexion and extension of elbow, wrist and fingers → NO BLOCK
Grade 1: Decreased motor strength compared with contralateral arm with ability to move the fingers only→ PARTIAL BLOCK
Grade 2: Complete motor block with inability to move the fingers→ COMPLETE BLOCK

Duration of motor block was defined as the time interval between the onset of motor block of all four nerve to complete recovery of motor function. (NO BLOCK-Grade 0).

Surgical anesthesia supplementation rate was defined as the proportion of patients needed supplementation of the block for achieving surgical anesthesia.

After confirming the success of the block, surgical incision was allowed.

Intravenous fluids and Oxygen supplementation given throughout the procedure. If a part of the surgical territory was not completely anesthetized at the time of surgery, the block was supplemented at the elbow or wrist. If the patient still experience pain despite supplementation, general anesthesia was and this group of patients will be excluded from this study.
The anesthesiologist who assessed the sensory and motor blockade was blinded to group allocation and type of block given.

POST OPERATIVE MANAGEMENT AND DATA COLLECTION

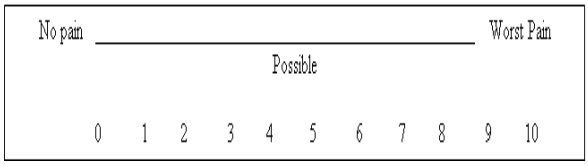
After the end of surgery patients were sent to Post Anesthesia Care Unit under the observation of a resident (blinded from executed procedure). Occurrences of any complication due to accidental vascular puncture, suspected diaphragmatic paresis resulting in a change in the breathing pattern and/or coughing difficulty, the appearance of Horner's syndrome and clinically significant pneumothorax (respiratory distress or desaturation) were noted The time of occurrence of first postoperative pain and the time of complete recovery of motor functions of the forearm and hand were recorded in every patient.

The patients who needed supplementation after completion of supraclavicular or infraclavicular block were not taken into consideration during postoperative data collection.

The duration of analgesia (the time between onset of sensory block of all four nerve and the first dose of rescue analgesic based on patient's need/request or VAS score>4) were recorded in each case.

Pain was assessed by Visual Analogue Scale at skin closure and 30 minute interval till patient received first rescue analgesia by anaesthesiologist team in PACU. VAS scale consisted of a 10 cm line, where the patients were asked to mark the pain intensity on the line in between 0 (no pain) to 10 (worst possible pain).

VISUAL ANALOGUE SCALE



Inj. Diclofenac Sodium 75mg were given IM as rescue analgesic when VAS>4 or patient demanded analgesia.

RESULTS

The patients of the two groups were matched for all demographic parameters (Age, Weight, Height, proportions of Gender) and ASA grade of the patients. (P>0.05)

There was no significant association between type of surgery and patients of the two groups (p=0.99).

There was also no significant difference in mean heart rate, mean SBP/DBP/MAP, SPO_2, Block performance time, Block performance related pain, duration of surgeryof the patients of the two groups for different time intervals (p>0.05).

Table-1: Comparison of proportion of patients with Sensory block of radial nerve at different time in two groups

Group	Time Interval			
	0 min	10 min	20 min	30 min
Group-S (n=60)	0(0.0%)	49 (81.7%)	60 (100.0%)	60 (100.0%)
Group-I (n=60)	0(0.0%)	50 (83.3%)	58 (96.6%)	60 (100.0%)
Z-test	0.01	0.29	1.85	0.01
p-value	0.99 NS	>0.05 NS	>0.05 NS	0.99 NS

NS -Statistically Not Significant, S- Statistically Significant

Test of proportion showed that there were no significant differences in the proportions of patients with Sensory block of radial nerve of the two groups at different time intervals. But proportion of patients with Sensory block of radial nerve of Group-I was higher than that of Group-S at 10 minute. But proportion of patients with Sensory block of radial nerve of Group-S

was higher than that of Group-I at 20 minute.

At 30 minute all the patients of both the groups had Sensory block of radial nerve.

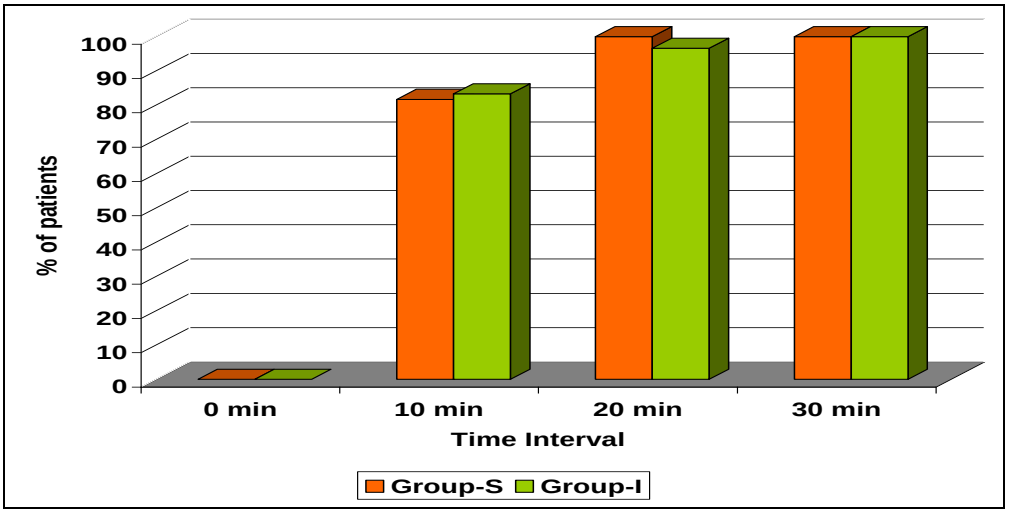


FIGURE-1

Table-2: Comparison of proportion of patients with Sensory block of ulnar nerveat different time of two groups

Group	Time Interval			
	0 min	10 min	20 min	30 min
Group-S (n=60)	0(0.0%)	29 (48.3%)	42 (70.0%)	52 (86.7%)
Group-I (n=60)	0(0.0%)	38 (63.3%)	51 (85.0%)	57 (95.0%)
Z-test	0.01	2.13	2.54	0.01
p-value	0.99 NS	<0.05 S	<0.05 S	0.99 NS

Test of proportion showed that there were no significant differences in the proportions of patients with Sensory block (ulnar nerve) of the two groups at 0 minute and 30 minute.

But proportion of patients with Sensory block (ulnar nerve) at 10 minute and 20 minute of Group-I were significantly higher than that of Group-S ($p<0.05$).

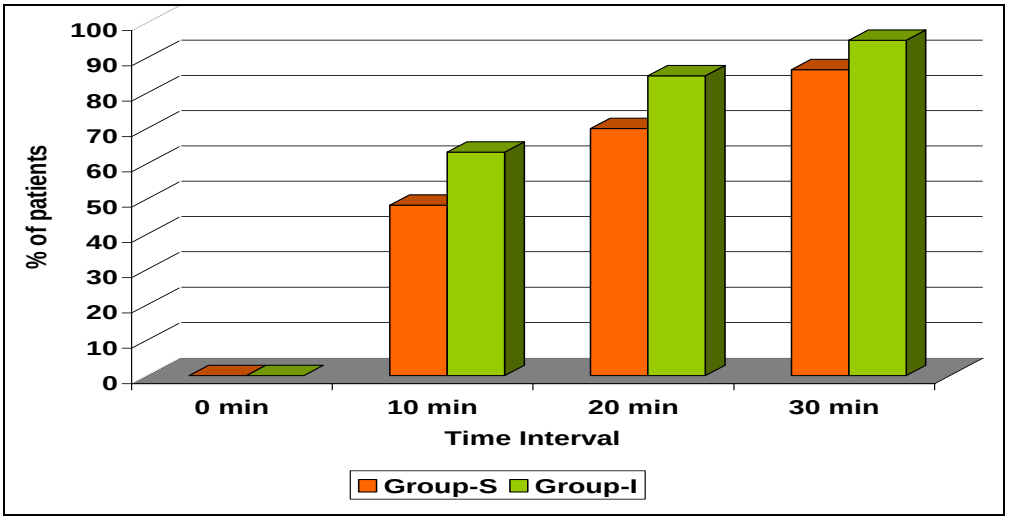


FIGURE-2

Table-3: Comparison of proportion of patients with Sensory block of median nerveat different time of two groups

Group	Time Interval			
	0 min	10 min	20 min	30 min
Group-S (n=60)	0(0.0%)	30 (50.0%)	47 (78.3%)	54 (90.0%)
Group-I (n=60)	0(0.0%)	36 (60.0%)	51 (85.0%)	57 (95.0%)
Z-test	0.01	1.42	1.22	1.34
p-value	0.99 NS	>0.05 NS	>0.05 NS	>0.05 NS

Test of proportion showed that there were no significant differences in the proportions of patients with Sensory block of median nerve of the two groups at all time intervals.

But proportion of patients with Sensory block of median nerve of Group-I were higher than that of Group-S at 10, 20, 30 minute.

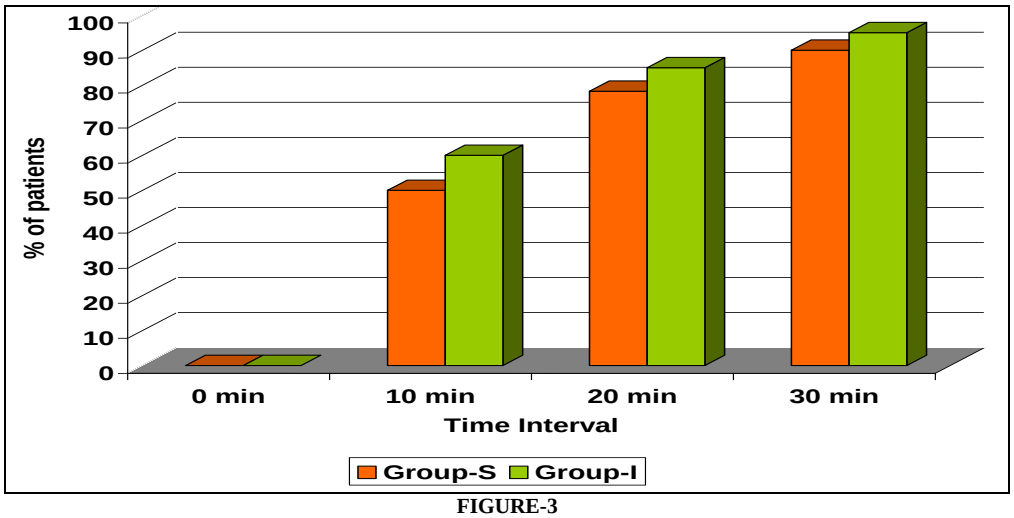


FIGURE-3

Table 4: Comparison of proportion of patients with Sensory block of musculocutaneous nerveat different time of two groups

Group	Time Interval			
	0 min	10 min	20 min	30 min
Group-S (n=60)	0(0.0%)	47 (78.3%)	60 (100.0%)	60 (100.0%)
Group-I (n=60)	0(0.0%)	51(85.0%)	60 (100.0%)	60 (100.0%)
Z-test	0.01	1.22	0.01	0.01
p-value	0.99 NS	>0.05 NS	>0.05 NS	>0.05 NS

Test of proportion showed that there were no significant differences in the proportions of patients with sensory block (musculocutaneous) of two groups at all time intervals.

But proportion of patients of Group-I were higher than that of Group-S at 10 minute. At 20 minute and 30 minute all the patients of both the groups had sensory block of musculocutaneous nerve.

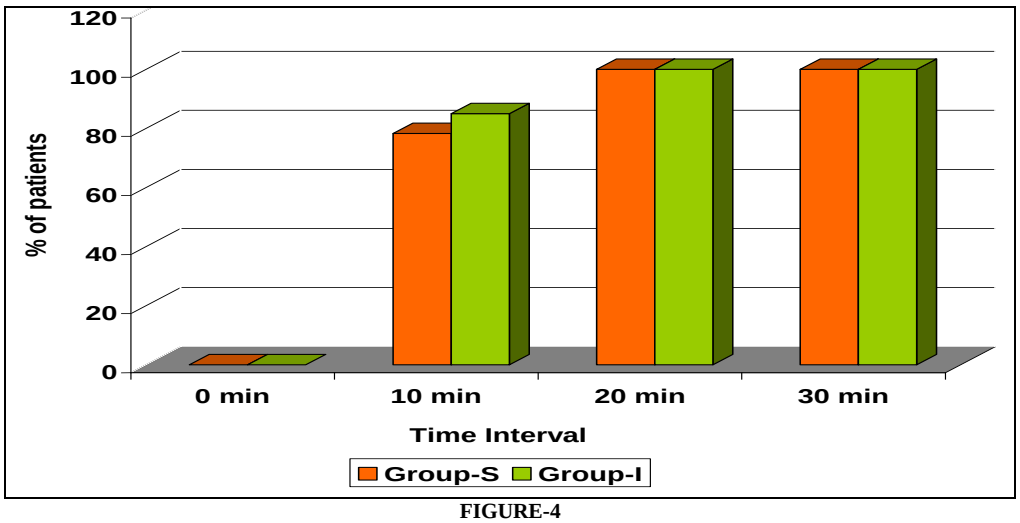


FIGURE-4

Table-5: Comparison of proportion of patients with readiness for surgery of the two groups

Group	Time Interval			
	0 min	10 min	20 min	30 min
Group-S (n=60)	0(0.0%)	23 (38.3%)	39 (65.0%)	51 (85.0%)
Group-I (n=60)	0(0.0%)	29 (48.3%)	49 (81.6%)	56 (93.3%)
Z-test	0.01	1.42	2.65	1.88
p-value	0.99 NS	>0.05 NS	<0.01 S	>0.05 NS

Test of proportion showed that there were no significant differences in the proportions of patients with readiness for surgery of the two groups at all time intervals except at 20 minute.

At 20minute proportion of patients with readiness for surgery of Group-I was significantly higher than that of Group-S ($p<0.01$).

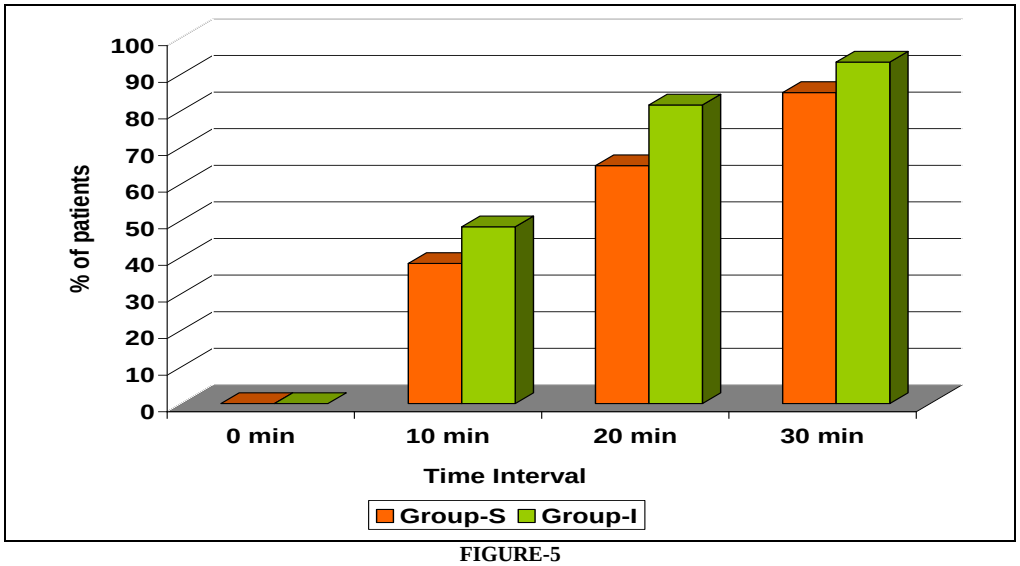


FIGURE-5

Table-6: Comparison of proportion of patients with motor block of two groups at 30 minute

Group	Block			
	Radial	Ulnar	Median	Musculocutaneous
Group-S (n=60)	60 (100.0%)	52 (86.6%)	54 (90.0%)	60 (100.0%)
Group-I (n=60)	60 (100.0%)	57 (95.0%)	57 (95.0%)	60 (100.0%)
Z-test	0.01	2.05	1.34	1.88
p-value	0.99 NS	<0.05 S	>0.05 NS	>0.05 NS

Test of proportion showed that there were no significant difference in the proportions of patients with motor block of median nerve of Group-S with Group-I ($p<0.05$) but significant difference noted in motor block of median nerve.

For both the groups all the patients had radial and Musculocutaneous ($p>0.05$).

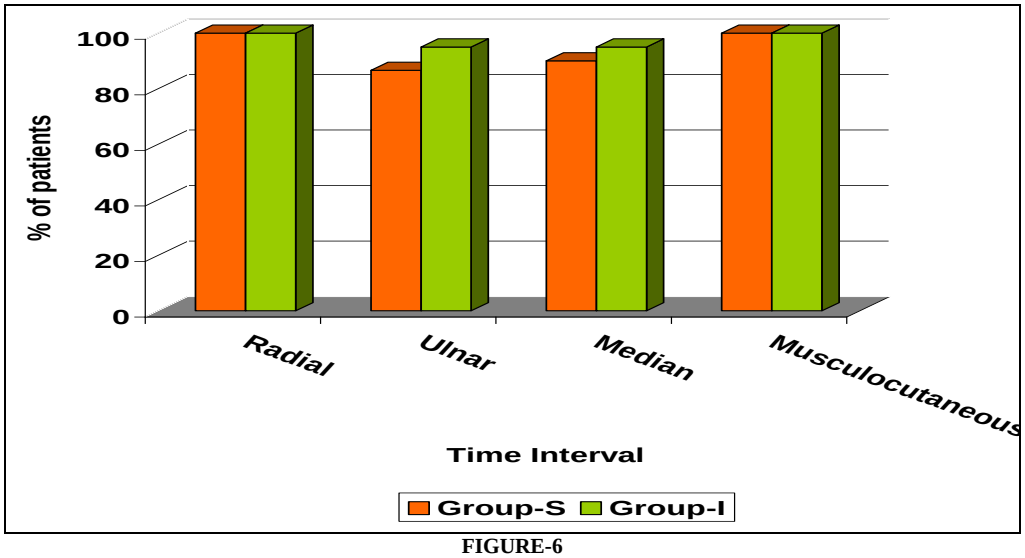


FIGURE-6

Table-7: Comparison of Surgical Anesthesia Supplementation between two groups.

	Group-S (n=60)	Group-I (n=60)	Z-value	p-value
Surgical Anesthesia Supplementation	9(15.4%)	4(6.7%)	2.58	<0.01S

Proportion of patients had Surgical Anesthesia Supplementation of Group-S was significantly higher than that of the patients of Group-I ($p<0.01$).

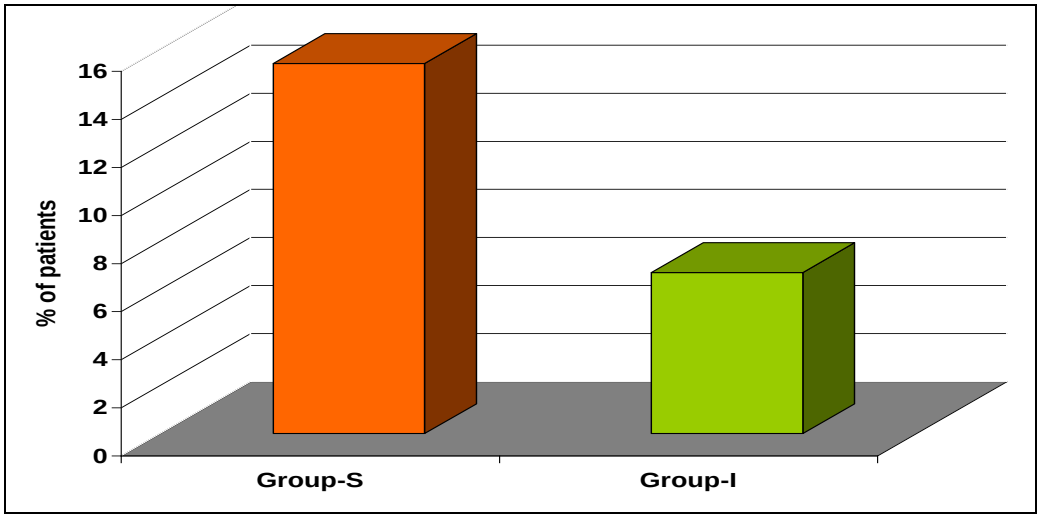


FIGURE-7

Table-8: Comparison of duration of sensory block between two groups

Parameters	Group-S (mean±s.d.) (n=51)	Group-I (mean±s.d.) (n=56)	Test Statistic	p-value
Duration of Sensory Block (min)	794.51±29.35	745.71±23.63	9.41	<0.0001S

't-test' showed that the mean duration of sensory block of Group-S were significantly higher than that of Group-I ($p<0.01$).

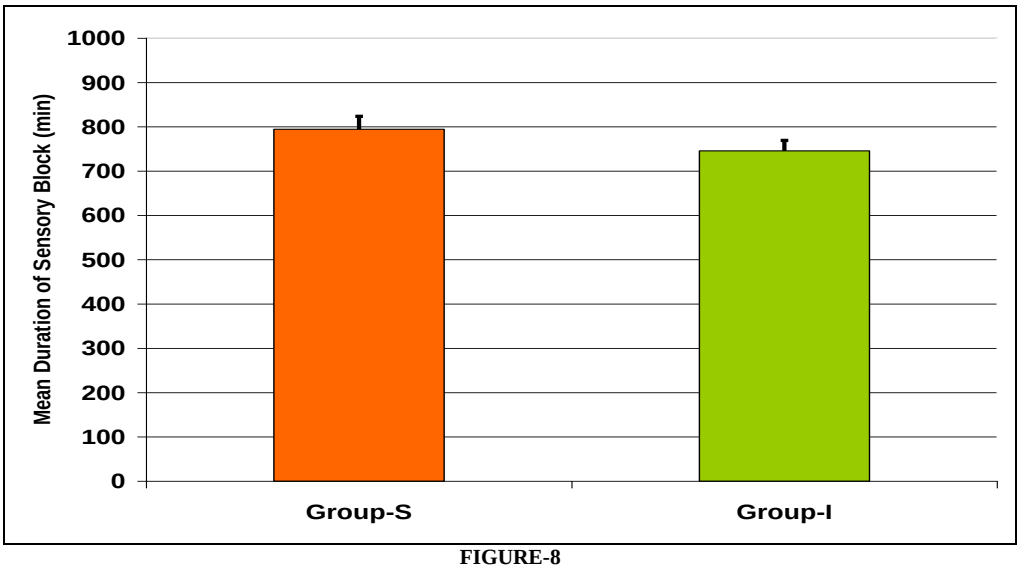


FIGURE-8

Table-9: Comparison of duration of motor block between two groups

Parameters	Group-S (mean±s.d.) (n=51)	Group-I (mean±s.d.) (n=56)	Test Statistic	p-value
Duration of Motor Block (min)	722.94±24.60	668.93±23.17	11.66	<0.0001S

't-test' showed that the mean duration of motor block of Group-S were significantly higher than that of Group-I ($p<0.01$).

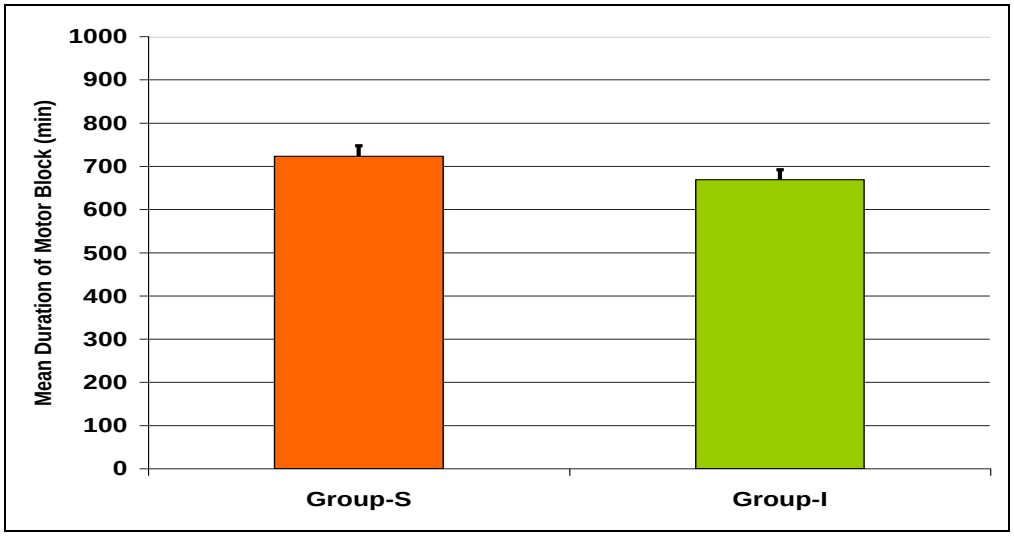


FIGURE-9

Table-10: Comparison of Duration of analgesia between two groups

Parameters	Group-S (mean±s.d.) (n=51)	Group-I (mean±s.d.) (n=56)	Test Statistic	p-value
Duration of analgesia (min)	805.88±29.81	755.27±23.48	9.69	<0.0001S

't-test' showed that the mean duration of analgesiaof Group-S were significantly higher than that of Group-I ($p<0.01$).

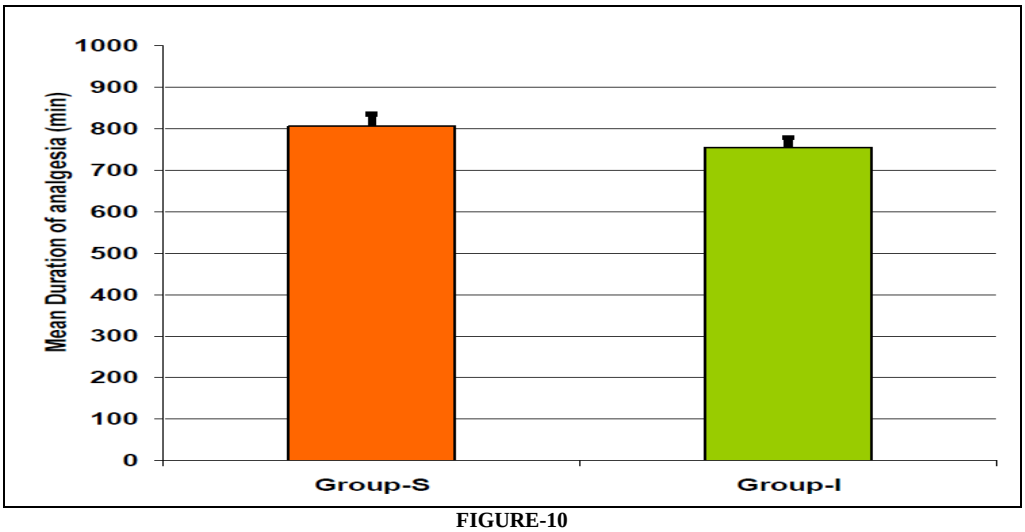


FIGURE-10

Table-11: Comparison of side effects between two groups

Adverse Effect	Group-S (n=60)	Group-I (n=60)	Z-value	p-value
Accidental vascular puncture	0(0.0%)	0(0.0%)	0.01	0.99 NS
Pneumothorax	0(0.0%)	0(0.0%)	0.01	0.99 NS
Suspected diaphragmatic paresis	6(10.0%)	0(0.0%)	3.24	<0.001S
Horner's syndrome	10(16.7%)	0(0.0%)	4.26	<0.001S

There was no difference in the proportion of patients with Accidental vascular puncture and Pneumothorax of the two groups ($p>0.05$).

Proportion of patients with Suspected diaphragmatic paresis and Horner's syndrome of Group-S was significantly higher than that of the patients of Group-I ($p<0.01$).

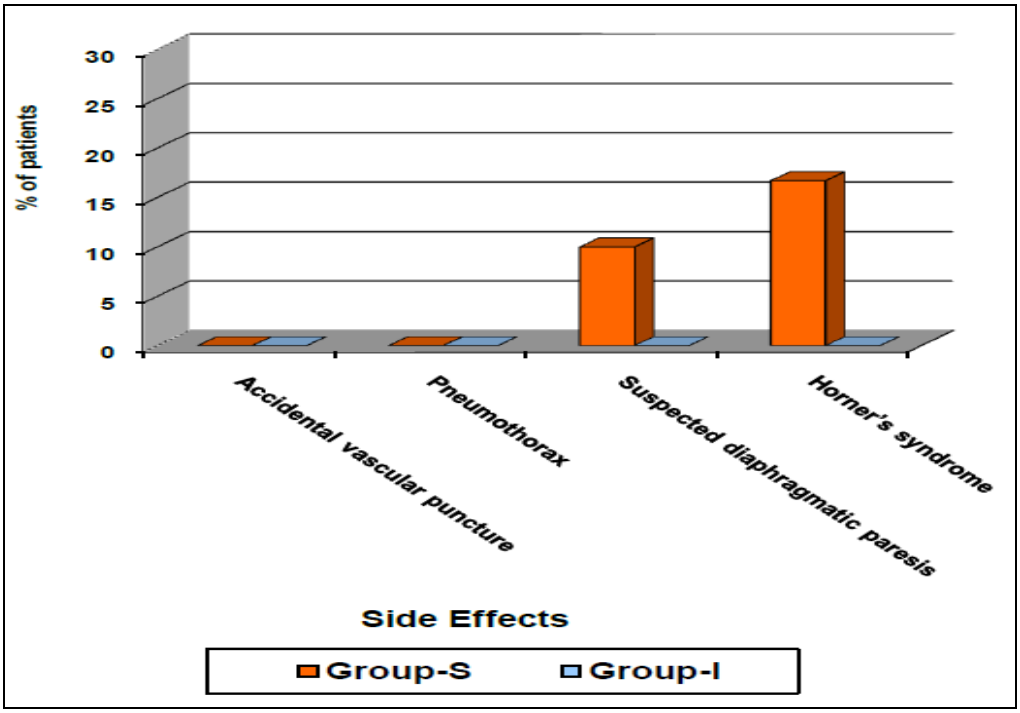


Figure: 11

DISCUSSION

The aim of this study was to compare the efficacy of ultrasound guided supraclavicular block and infraclavicular block for sensory and motor component as well as postoperative analgesia in patients undergoing upper limb surgery.

In this study 120 adult patients of age between 18 and 80, with ASA physical status I & II were randomly allocated to receive either USG guided supraclavicular block (Group S) or USG guided infraclavicular block (Group I). 60(50.0%) patients were in the Group-S and rest 60(50.0%) patients were in the Group-I. Thus the patients of the two groups were in ratio 1:1.

The two groups were similar in terms of demographic parameters, Haemodynamic parameters and respiratory parameters.

The duration and type of distribution of surgery block performance time and block performance related pain was also similar in two groups.

In this study we found that there were no significant differences in the proportions of patients with Sensory block of radial nerve between two groups at different time intervals. p-value was >0.05 in all time interval.

But number of patients with sensory block of radial nerve of Group-I (50, 83.3%) was higher than that of Group-S(49, 81.7%) at 10 minute.

On the other hand number of patients with sensory block of radial nerve of Group-S(60, 100%) was higher than that of Group-I(58, 96.6%) at 20 minute.

At 30 minute all the patients of both the groups had Sensory block of radial nerve. [Tables 1 and figure 1]

There were no significant differences in the proportions of patients with Sensory block of ulnar nerve between two groups at 0 minute and 30 minute (S-86.7% &I-95.0%)(P>0.05).

But proportion of patients with Sensory block of ulnar nerve at 10 minute and 20 minute of Group-I(63.3% &85.0%) were significantly higher than that of Group-S(48.3% &70.0%) (p<0.05)

More number of patients of I group achieved sensory block of ulnar nerve at all time interval than S group.[Tables 2 and figure 2]

Test of proportion showed that there were no significant differences in the

proportions of patients with Sensory block of median nerve between the two groups at all time intervals. But number of patients with Sensory block of median nerve of Group-I (60.0%,85.0%&95.0%) were higher than that of Group-S(50.0%,78.3% &90.0%) at 10, 20, 30 minute. (P>0.05) [Tables 3 and figure 3]

Test of proportion showed that there were no significant differences in the proportions of patients with sensory block (musculocutaneous) of two groups at all time intervals.

At 20 minute and 30 minute all the patients of both the groups had sensory block of musculocutaneous nerve. (P>0.05) [Tables 4 and figure 4]

This finding corroborates with study done by Koscielniak-Nielsen ZJ[6]andGurkan Y et al.[7] where in supraclavicular approach resulted in significantly poorer block of the median and the ulnar nerves than the infraclavicular approach. Either approach resulted in good blocks of the musculocutaneous and the radial nerves.

But in study done by Arcand et al.[8] showed that sparing of radial nerve more in infraclavicular group than supraclavicular group as a single injection technique was used in this study. They explained it as the cords of the brachial plexus were compactly arranged around the axillary artery and the posterior cord was deeper from entry point of the needle than the lateral or median cords, resulted in incomplete block of the radial nerve.

Test of proportion showed that there were no significant differences in the proportions of patients with readiness for surgery of the two groups at all time intervals except at 20 minute. (S group-10min38.3% & 30 min 85.0%; I group-10min48.3% & 30 min 93.3%; p>0.05) [Tables 5 and figure 5]

At 20minute proportion of patients with readiness for surgery in Group-I (81.6%) was significantly higher than that of Group-S (65.0%) (p<0.01)

In study done by Koscielniak-Nielsen ZJ[6] found that after 30 min, the infraclavicular group had a more effective block, with 93% of patients ready for surgery compared with only 78% of patients in the supraclavicular group, corroborates with our study.

In case of motor block, no significant difference was noted in the proportions of patients with motor block of median nerve between two groups but significant difference was noted in motor block of ulnar nerve (86.6% vs95.0%, P<0.05).In this case infraclavicular block better than supraclavicular block.

For both the groups all the patients had motor block of both radial and Musculocutaneous nerve (p>0.05). [Tables 6 and figure 6]

In study done by Koscielniak-Nielsen ZJ[6] et al showed superior motor block quality in infraclavicular group than supraclavicular group.

Proportion of patients having Surgical Anaesthesia Supplementation of Group-S (15.4%) was significantly higher than that of the patients of Group-I (6.7%)(p<0.01). In our study 4 partial block failures required supplementation in the I group compared with 9 partial failures in the S group. The ulnar nerve was the most commonly supplemented nerve in the S group (8 patients), followed by the median nerve (6 patients). In I group both ulnar and median nerve supplemented in 3 patients. Five patients in the S group and two in the I group required supplementary blocks of more than one nerve. [Tables 7 and figure 7]

Study by Koscielniak-Nielsen ZJ[6] et al. showed similar finding as the surgical anaesthesia supplementation required in the I group was 7% and S group was22%, (P=0.017). There were 4 partial block failures requiring supplementation inthe I group compared with 12 partial failures in the S group. Here also ulnar nerve was the most commonly supplemented nerve in the S group (10 patients), followed by the median nerve (6 patients). Seven patients in the S group and two in the I group required supplementary blocks of more than one nerve.

Study done by Gurkan Y et al.[7] showed that Group I patients had a significantly improved block of the median and ulnar nerves than Group S.

So both the study Koscielniak-Nielsen ZJ[6] and Gurkan Y et al.[7]corroborates with our study where success rate in I group higher than S group.

Finding was different in study done by Arcand et al.[8] where partial or complete sensory block of all nerve territories was better in Group S than in Group I, mostly because of radial sparing in Group I as single injection technique used. In another study Sandhu et al.[9], using a triple injection USG guided infraclavicular block, achieved 90% surgical blocks without supplementation in 126 patients undergoing upper extremity surgery.

There was no significant difference between mean duration of surgery of the two groups (p>0.05). Thus two groups were matched for duration of surgery. (S-89.33±6.58, I-89.45±7.72 P=0.92).

The mean duration of sensory block in Group-S (794.51±29.35 min) were significantly higher than that of Group-I (745.71±23.63min) (p<0.01). [Tables 8 and figure 8]

The mean duration of motor block in Group-S (722.94±24.60min) were significantly higher than that of Group-I (668.93±23.17 min) (p<0.01). [Tables 9 and figure 9]

The mean duration of analgesia of Group-S (805.88±29.81 min)were significantly higher than that of Group-I (755.27±23.48 min) (p<0.01).[Tables 20 and figure 47]Study done by Holmberg A et al[10] found that mean (SD) time to first rescue analgesic after emergence from general anaesthesia in infraclavicular group was 544 (217) min. Another study done by MojganVazin et al[11], found that duration of analgesia was more in infraclavicular group than supraclavicular group. Both study finding does not corroborate with our study.

There was no difference in the proportion of patients with Accidental vascular puncture and Pneumothorax of the two groups (p>0.05). Study done by Koscielniak-Nielsen ZJ[6], Arcand et al.[8] found similar finding.

Proportion of patients with Horner's syndrome of Group-S(16.7%) was significantly higher than that of the patients of Group-I(0%) (p<0.01).This finding corroborates with study done by Koscielniak-Nielsen ZJ et al[6] ,Gurkan Y et al.[7], Anatoli Stav et al[13] and De QuangHieu Tran et al[3] where S group experienced more side effect than I group.

In case of suspected diaphragmatic paresis group S (10%) had higher incidence than group I (0%). This finding corroborates with study done by Koscielniak-Nielsen ZJ[6] et al. The study done by Joseph M. Neal et al.[12] showed 50% incidence of hemidiaphragmatic paresis that was not accompanied by clinical evidence of respiratory compromise in supraclavicular block. [Tables 11 and figure 11]

CONCLUSION

We conclude that ultrasound guided infraclavicular block provides superior quality of sensory, motor block and less side effect whereas duration of sensory block, motor block and postoperative analgesia was greater in USG guided supraclavicular block.

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