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Original Research Article

Comparison between Conventional and Ultrasound Guided Supraclavicular Brachial Plexus Block in Upper Limb Surgeries

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Abstract:

The study compares the conventional subclavian perivascular approach with the ultrasound-guided technique for supraclavicular brachial plexus blocks. It examines parameters such as procedure time, block onset and duration, success rate, overall effectiveness, and complications. The goal is to assess the advantages and limitations of each technique. This study involves 60 patients divided into two groups: conventional and ultrasound-guided blocks. Parameters such as procedure time, block onset and duration, success rate, and complications were assessed. The study followed ethical guidelines, used randomized sampling, and employed statistical analysis. Preoperative evaluations, standard procedures, and continuous monitoring were conducted during surgery. Data collection occurred post-operatively at specific intervals. Statistical tests were used for comparison, considering p-values for significance. The demographic data showed an equal distribution of age groups between the two groups, and the gender distribution was comparable as well. The ultrasound-guided technique took slightly more time for the procedure compared to the conventional technique. However, the onset of motor and sensory blockade was significantly faster with the ultrasound-guided technique. The duration of sensory and motor blockade was shorter in the ultrasound group compared to the conventional group. There were no significant changes in pulse rate, systolic blood pressure, or diastolic blood pressure between the two groups. The incidence of complications and the need for analgesic supplementation were lower in the ultrasound group. Overall, the study suggested that the ultrasound-guided technique for supraclavicular brachial plexus block provided faster onset of blockade, shorter duration, and reduced analgesic supplementation compared to the conventional technique.

Keywords: Upper Limb Surgeries, conventional blocks, ultrasound-guided blocks, subclavian perivascular, supraclavicular brachial plexus

Introduction

Pain is a general term used to describe unpleasant sensations in the body, ranging from mild discomfort to severe debilitation. The International Association for the Study of Pain (IASP) recently revised the definition of pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Pain can have various causes and interpretations, leading to differences in severity, quality, and duration [1].

To alleviate pain during surgical procedures, anesthesia is used to reduce or eliminate discomfort. Anesthesia involves the administration of anesthetics, either orally, intravenously, or both, to block pain and other sensations during medical procedures. Different types of anesthesia include local anesthesia, regional anesthesia, and general anesthesia [2].

In certain cases, such as upper extremity fractures, dislocations, and abscesses, local anesthetics may not provide sufficient pain relief. Conscious sedation is often used as an alternative, but it carries the risk of side effects such as apnea and hypotension. General anesthesia can also be used, but it may involve unwanted side effects like tracheal intubation and laryngoscopy. Regional anesthesia, which involves injecting local anesthetics around important body nerves or the spinal cord, offers better intraoperative and postoperative pain relief while minimizing side effects. Peripheral nerve blocks and epidural nerve blocks are examples of regional anesthesia techniques [3].

For surgeries involving the upper limbs, brachial plexus blocks are a suitable alternative to general anesthesia. The brachial plexus is a network of nerves responsible for sensory, motor, and sympathetic innervation of the upper extremities.

By administering regional anesthesia to the brachial plexus, deep and predictable anesthesia can be achieved rapidly. The supraclavicular approach is often preferred due to its simplicity, low risk of complications, and ability to cover a large area of the brachial plexus [4, 5, 6].

The first brachial plexus block was performed in 1889 by William Stewart Halsted using cocaine. Since then, various modifications have been made to reduce the risk of complications. The supraclavicular block technique has been considered challenging and associated with a higher risk of pneumothorax. However, its benefits, such as rapid onset, reliable anesthesia, and high success rate, make it a valuable option for upper extremity regional anesthesia [7, 8, 9, 10, 11].

Traditional techniques for supraclavicular brachial plexus blocks, despite being preferred by many anesthesiologists for their efficiency, have limitations. The conventional subclavian perivascular paresthesia technique is blind and may result in a higher failure rate and potential damage to the vascular and nerve systems [5]. To address these issues, ultrasound-guided techniques have been introduced, allowing for safer and more precise needle placement, increased success rates, and improved block quality [12].

This study aims to compare the conventional subclavian perivascular approach, a well-established technique, with the newer ultrasound-guided technique for supraclavicular brachial plexus blocks. The study evaluates factors such as procedure time, block onset and duration, success rate, overall effectiveness, and the incidence of complications. By analyzing these parameters, the study aims to determine the relative advantages and limitations of each technique [12].

This study compared the time required for the procedure, the onset and duration of the block, the success rate, the overall effectiveness of the block, and the incidence of complications involved between the conventional, well-established

subclavian perivascular approach and the more recently popular ultrasound guided technique for the block.

Material and Methods

Materials

The study titled "Comparison between conventional and ultrasound-guided supraclavicular brachial plexus block in upper limb surgeries" was conducted at the Department of Anesthesiology & Critical Care, Darbhanga Medical College and Hospital Laheriasarai, Darbhanga. The study took place from 1 March 2021 to December 2022 and followed a prospective randomized design. The sample consisted of 60 patients of both sexes, divided into two groups: Group C for conventional supraclavicular brachial plexus block and Group US for ultrasound-guided supraclavicular brachial plexus block. The sampling method used was randomized sampling. The statistical analysis employed Student's t-test and chi-square test.

Method of Collection of Data

The study was carried out in 60 ASA I or ASA II patients, aged from 18 to 50 years, who underwent elective upper limb surgeries under supraclavicular block after receiving approval from the institutional ethics committee, Darbhanga Medical College and Hospital Laheriasarai, Darbhanga. All patients were told about the procedure before being included in the study, and the patient or the patient's attendants signed a written informed consent form. A pre-established proforma was used to record the result values. Patients were chosen based on following inclusion and exclusion criteria.

Inclusion criteria

1. Patients of either sex, aged between 18 and 50 years
2. Patients with American Society of Anesthesiologists (ASA) Grade I and II
3. Elective upper limb surgeries.

Exclusion criteria

1. Patients <18 years and >50 years of age
2. Patient refusal
3. Patients with significant coagulopathy or peripheral neuropathy
4. ASA Grade IlI and IV patients
5. Allergy to local anesthetics.
6. Infection at local site.

Parameters to be studied:

The study assessed various parameters including the time taken for the procedure, onset and duration of sensory neural blockade, onset and duration of motor blockade, success rate, and incidence of complications. The time taken for the procedure was measured differently between groups C and US, with group C measuring from needle insertion to removal, and group US measuring from the beginning of scanning to needle removal.

The onset of sensory block was determined by the interval between needle removal and the patient reporting reduced pain from a pin prick in the blocked limb compared to the unaffected limb. The onset of motor block was measured from needle removal to the patient experiencing joint weakness during active movement.

Grading of sensory blockade: (by pin prick method)

- 0 no pain
- + mild pain
- ++ moderate pain
- +++ severe pain.

Grading of motor blockade:

- 0 no contraction
- 1 Flicker of contraction
- 2 Active movement with gravity eliminated
- 3 Active movement with gravity
- 4 Active movement with gravity and resistance
- 5 Normal powers

Any perioperative problems, such as bradycardia, hypotension, nausea, vomiting, and respiratory distress; as well

as local hematoma, pneumothorax, and surgical emphysema, were documented and attended to. Unaware of the method utilised, an impartial observer evaluated the sensory and motor blocks.

Procedure

Patients underwent standard preoperative evaluations and received approval from an institutional review board. In the operating room, they received pre-medication intravenously. Aseptic procedures were followed, and patients were positioned supine with their heads turned to the unaffected side for supraclavicular blocks. Randomization assigned patients to two groups. The block was performed using a mixture of normal saline, rupivacaine 0.75%, and lignocaine with adrenaline. During surgery, vital signs such as heart rate, blood pressure, ECG, and oxygen levels were continuously monitored. After surgery, patients were observed in the recovery area and ward, with data collected every 3 minutes for the first 15 minutes and every 30 minutes for at least 8 hours post-operatively.

Statistical Analysis

The mean and standard deviation were used to express all values. Student's t-test and chi-square test were used to perform statistical comparison. A two-tailed p value of > 0.05 was regarded as statistically insignificant, while p values of <0.05, <0.01, and <0.001 were regarded as statistically significant, very significant, and highly significant, respectively.

Results

The prospective, randomized, comparative study was conducted in the Department of Anesthesiology & Critical Care, Darbhanga Medical College and Hospital Laheriasarai, Darbhanga on 60 patients aged between 18-50 years posted for upper limb surgeries to compare the conventional & Ultrasound guided supraclavicular brachial plexus block in terms of time taken for the procedure, onset & duration of sensory & motor blockade respectively, success rate & complications.

Demographic data

Age

As shown in Table 1, the minimum age of the patient was 18 years and the maximum age was 50 years. The total numbers of persons in Conventional Group and Ultrasound group in the age group 18-50 years were 30 each respectively.

The total number of persons in Conventional Group within the age group 31-40 years is 6 (20%) and in Group US also, it is 6 (i.e., 20%). The total number of persons in Group C in the age group 41-50 years was 12 while in Group US, it was 13. The highest numbers of (40% each) patients were there in the age range of 18-30 and 41-50 years under conventional group while under US group the (43.3%) patients were highest in age group of 41-50 years. Statistical analysis was done between both groups age range and p value of 0.765 ($p>0.05$) was obtained, hence statistically not significant. So, the age distribution between the two groups is comparable.

Gender distribution

As shown in the figure 1, the gender distribution (male: female ratio) in group C was 20:10 while in group US, it was 17:13. It was observed that the highest number of patients were male as compared to female in both of the groups. The P value of 1 ($p>0.5$) was obtained, hence, it is not significant and the groups are comparable.

Time taken for the procedure As shown in figure 2, the mean time taken to perform a conventional block was 4.83±0.5 minutes and in group US, it was 5.43 ± 1.11 minutes. Gender wise, in US group the time taken by male patients was 5.08±0.69 minutes while female patient's time taken for the procedure was 5.88±1.41 minutes. Similarly, in Conventional group the time taken by male patients was 4.87±0.53 minutes while female patient's time taken for the procedure was 4.75±0.63 minutes.

Thus it was observed that the time taken for the procedure was less in conventional group as compared to US group. The statistical analysis by Anova: Single Factor showed that, ultrasound guided technique was significantly faster to perform when compared to conventional technique (p=0.01).

Onset of Motor blockade

As shown in Table 2, the mean time for onset of motor block in group C was 11.05±4.19 minutes and in group US, it was 8.26 ±1.89 minutes. The minimum onset minutes of motor blockade in both groups were 6 minutes while maximum onset minutes of motor blockade in Conventional group were 20 minutes while 16 minutes were there in US group. The statistical analysis by t-Test: Two-Sample Assuming Equal Variances showed that the time for onset of motor block in group US was significantly faster when compared to group Conventional (p= 0.001).

Onset of Sensory blockade

As shown in Table 3, the mean time for onset of sensory blockade in group C was 11.21±4.22 minutes and in group US, it was 9 ±3.44 minutes. The minimum onset minutes of sensory blockade in Conventional group and US group were 5 minutes and 4.5 minutes respectively while maximum onset minutes of sensory blockade were 17 minutes in Conventional group while 15 minutes were there in US group. The statistical analysis by t-Test: Two-Sample Assuming Equal Variances showed that the time for onset of sensory blockade in group US was significantly faster when compared to group Conventional (p= 0.02).

Duration of Sensory blockade

As shown in Table 4, the mean time for duration of sensory blockade in group Conventional was 331.06±50.08 minutes and in group US, it was 298.7±42.4 minutes. The minimum duration minutes of sensory blockade in Conventional group and US group were 260 minutes and 252 minutes respectively while maximum duration minutes of sensory blockade were 410 minutes in Conventional group while 425 minutes were there in US group. The statistical analysis by t-Test: Two-Sample Assuming Equal Variances showed that the time for duration of sensory blockade in group US was significantly faster when compared to group Conventional (p= 0.009).

Duration of motor blockade

As shown in Table 5, the mean time for duration of motor blockade in group Conventional was 323.16±48.2 minutes and in group US, it was 284.2±38.5 minutes. The minimum duration minutes of motor blockade in Conventional group and US group were 245 minutes and 240 minutes respectively while maximum duration minutes of motor blockade were 400 minutes in Conventional group while 410 minutes were there in US group. The statistical analysis by t-Test: Two-Sample Assuming Equal Variances showed that the time for duration of motor blockade in group US was significantly faster when compared to group Conventional (p= 0.001).

Haemodynamic parameters

Pulse Rate (Beats per Min)

As shown in the figure 3, there is no significant change in the pulse rate between the US group and conventional group with the p value of >0.05 in each of the time assessment range for pulse rate.

Systolic BP

As shown in the figure 4, there is no significant change in the systolic blood pressure between the US and conventional groups (p>0.05). There was no episode of hypotension in both the groups.

Diastolic BP

As shown in the figure 5, there is no significant change in the diastolic blood

pressure between the US and conventional groups with (p>0.05).

Complications

Incidence of vessel puncture/ hematoma was 4% in Conventional group compared to 3.3% in US group which was not significant with a p value = 0.16. While the patients with no complications were 86.6% in conventional group and 96.6% in US group. No other complication was elicited in either of the groups (Figure 6).

Supplementation As shown in the figure 7, in Group US, 1 out of 30 patients required analgesic supplementation (Ketamine 100 mg) during surgery and in conventional group, it was 6 out of 30 patients. The requirement of analgesics was significantly reduced in ultrasound group than in conventional group with the p value of (p = 0.04)

Table 1: Age-Wise Distribution of study groups

	Conventional		US		P
Age in years	No. of patients	Percent (%)	No. of patients	Percent (%)	value
18-30	12	40	11	36.66667	0.765
31-40	6	20	6	20	
41-50	12	40	13	43.33333	
Total	30	100	30	100	
Mean	35.8		36.7		
Standard deviation	11.8		12.2		
Standard error	2.16		2.23		

Table 2: Comparison of conventional and ultrasound guided block on the basis of time taken for the onset of motor blockade

Onset of motor blockade (mins)	US	Conventional	P Value
Average	8.26	11.05	0.001606
SD	1.897064	4.196365	
Min Onset (mins)	6	6	
Max Onset (mins)	16	20	

Table 3: Comparison of conventional and ultrasound guided block on the basis of time taken for the onset of sensory blockade

Onset of sensory blockade (mins)	US	Conventional	P Value
Average	9	11.21	0.02
SD	3.441632	4.227748	
Min Onset (mins)	4.5	5	
Max Onset (mins)	15	17	

Table 4: Comparison of conventional and ultrasound guided block on the basis of duration of sensory blockade

Duration of sensory blockade (mins)	US	Conventional	P Value
Average	298.7	331.06	0.009
SD	42.41352	50.08678	
Min duration (mins)	252	260	
Max duration (mins)	425	410	

Table 5: Comparison of conventional and ultrasound guided block on the basis of duration of motor blockade

Duration of motor blockade (mins)	US	Conventional	P Value
Average	284.2	323.16	0.001
SD	38.51502	48.23869	
Min duration (mins)	240	245	
Max duration (mins)	410	400	

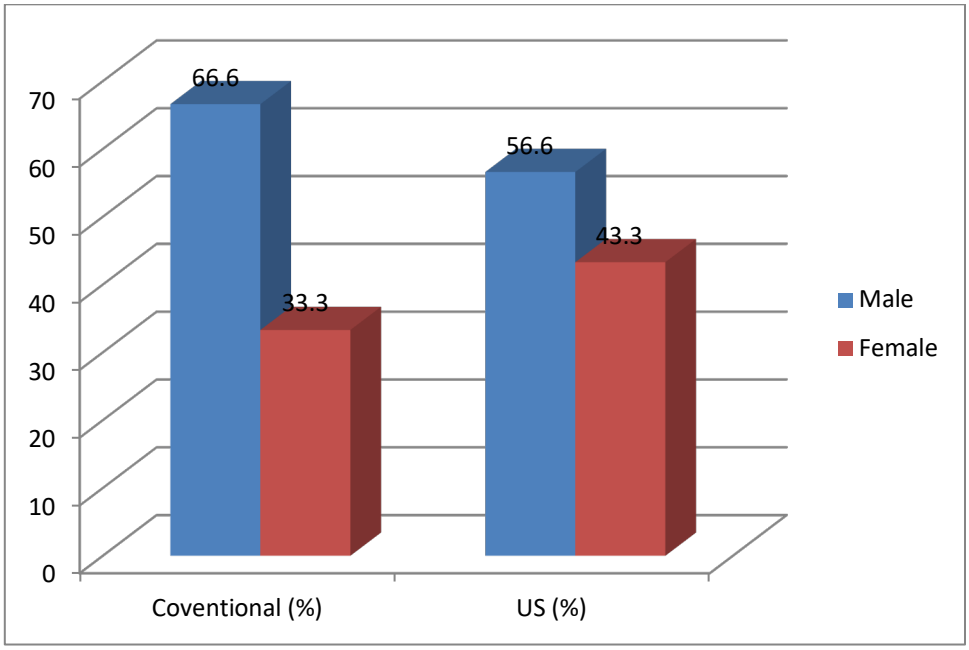

Figure 1: Gender based distribution of patients in Conventional and US groups

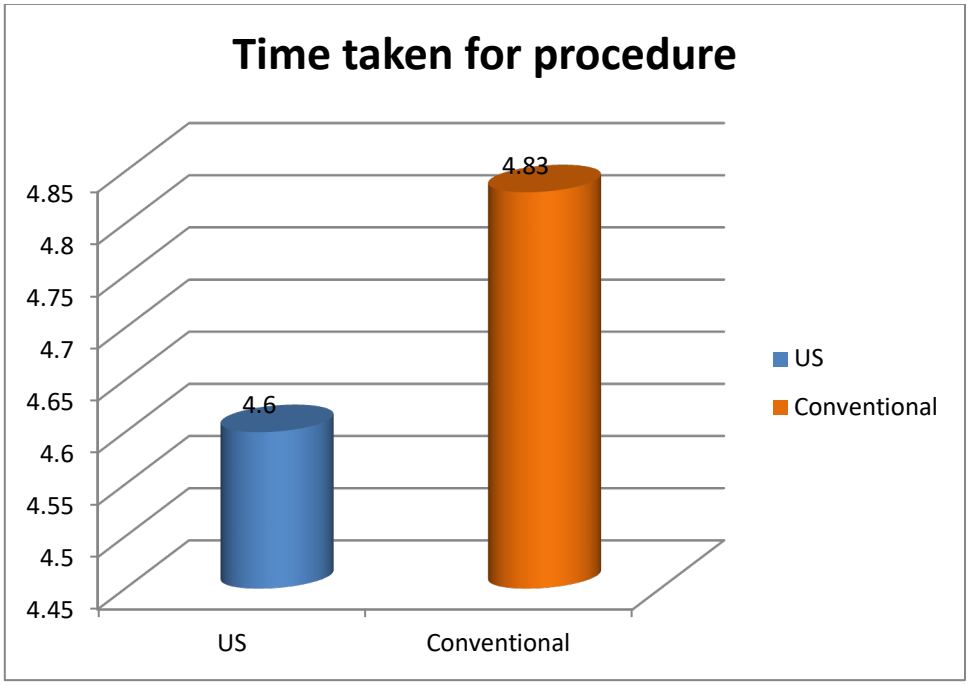

Figure 2: Time taken for the procedure in US and Conventional group

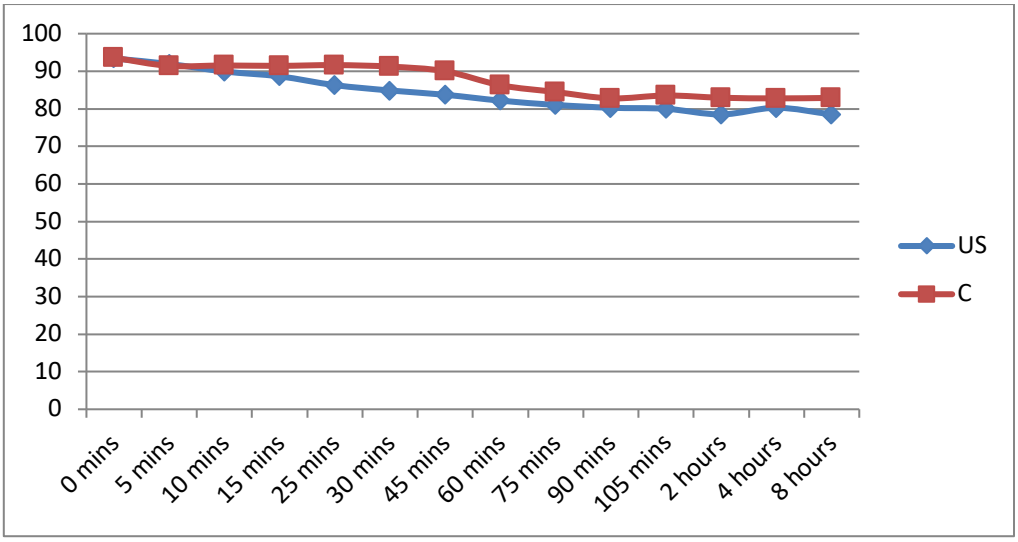

Figure 3: Pulse rate variation in both groups

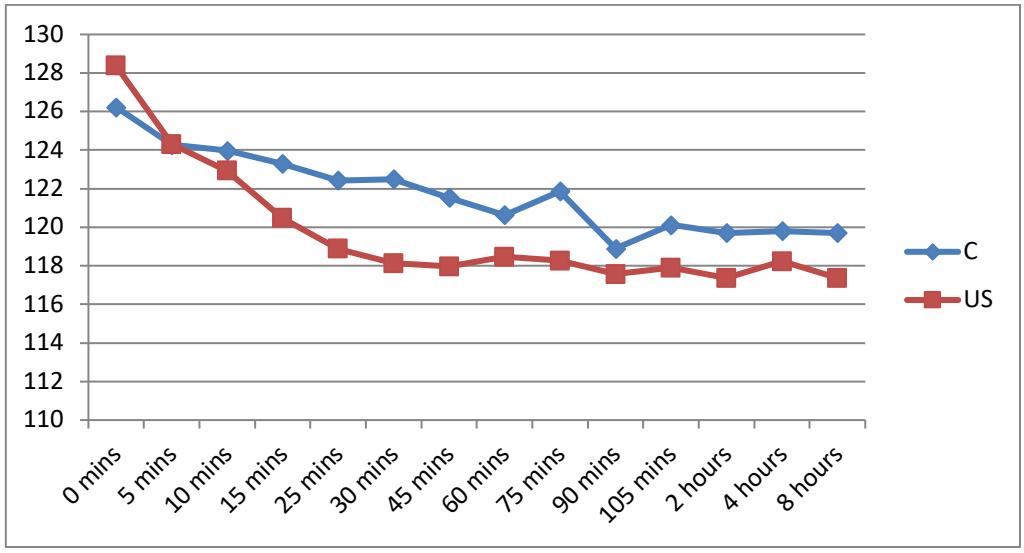

Figure 4. Systolic blood pressure variation in both groups

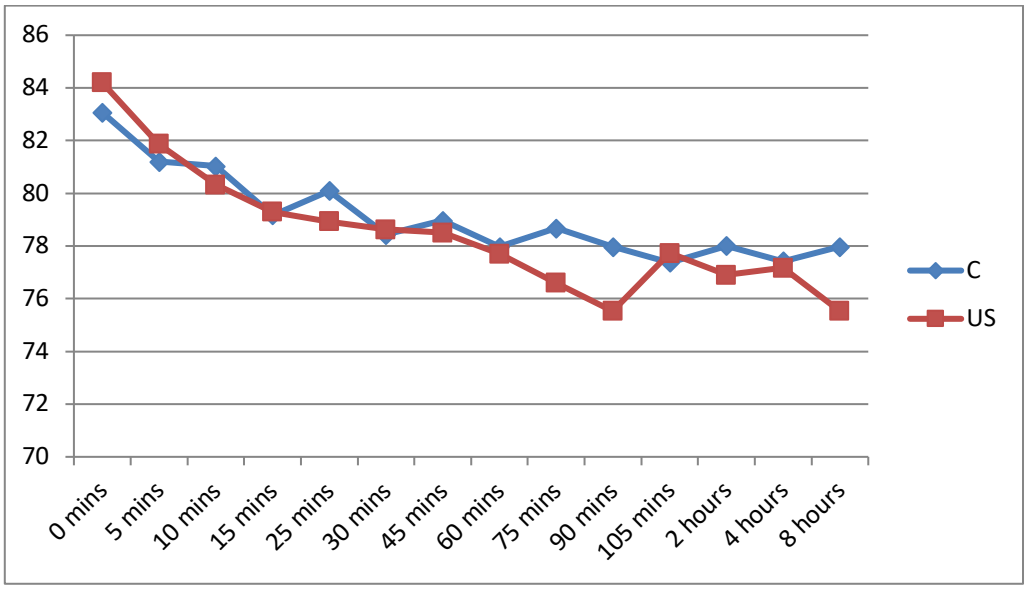

Figure 5: Diastolic blood pressure variation in both groups

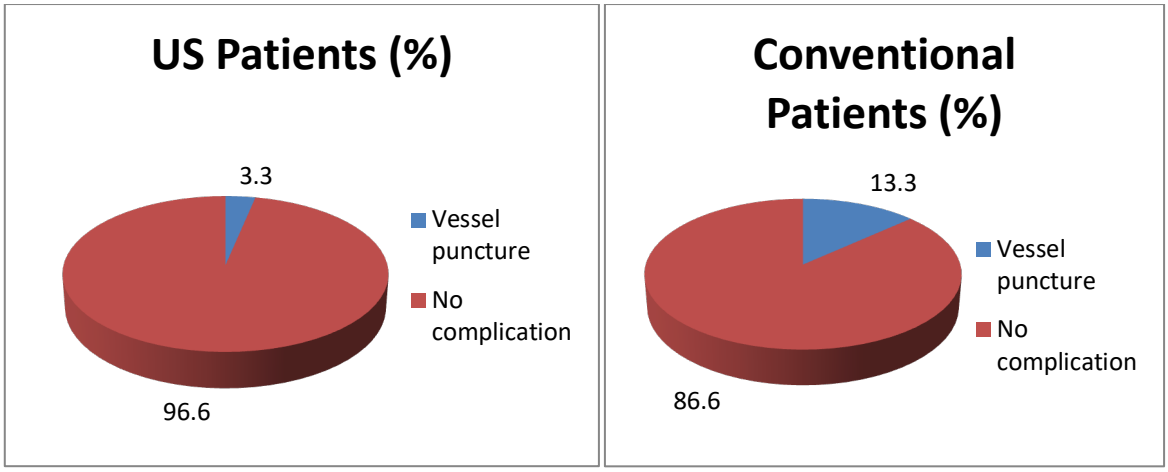

Figure 6: Variation of complications occurred in US and conventional group

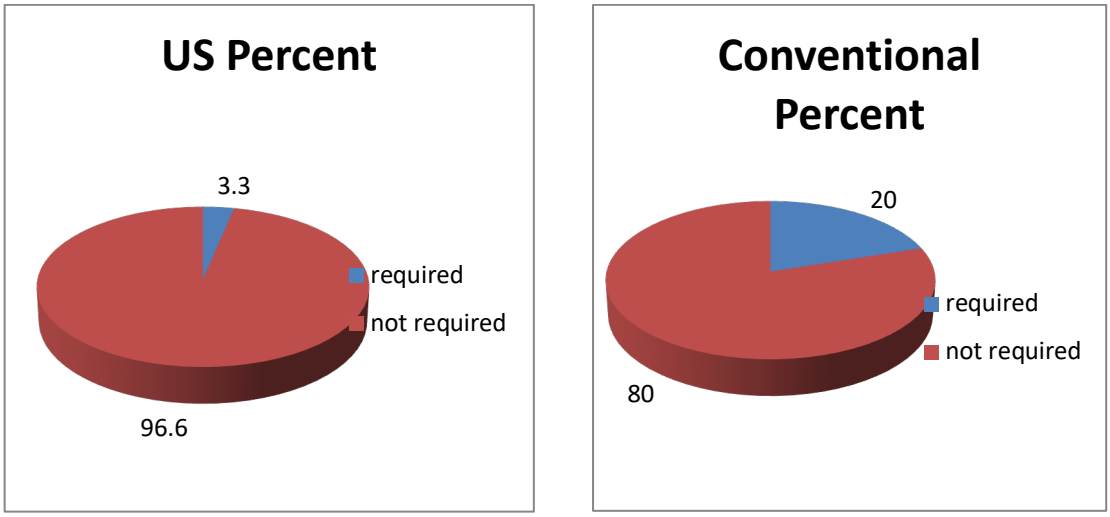

Figure 7: Requirement of supplementation in US and conventional group.

Discussion

Peripheral nerve blocks are an effective and cost-efficient approach to providing high-quality anesthesia and analgesia without the need for airway equipment or the negative effects of general anesthesia. The increasing demand for affordable anesthesia, along with positive postoperative recovery outcomes and patient satisfaction, has led to the growing popularity of regional procedures.

The brachial plexus block, a safe and straightforward method for upper limb surgeries, has been performed using various techniques such as supraclavicular, interscalene, infraclavicular, and axillary approaches [13, 14]. The supraclavicular approach has been associated with fast and consistent anesthesia onset. Despite the development of ultrasound technology, the traditional blind approach, particularly for supraclavicular brachial plexus blocks, remains commonly used by most anesthesiologists [15].

A study is planned to compare the use of conventional and ultrasound-guided supraclavicular brachial plexus blocks for upper limb surgeries [16]. The goal is to assess their effectiveness and determine if ultrasound guidance offers any advantages. Anesthesiologists experienced in peripheral nerve blocks using neurostimulation need to acquire new knowledge and skills to utilize ultrasound for regional anesthesia, as highlighted by previous research [17].

Relevance of the study with age and gender Regarding age and gender, the patients in our study did not vary significantly. Age-wise distribution between groups had a p value of 0.765 and gender distribution had a p value of 1, neither of which are statistically significant ($p>0.05$). In our study, the mean age was 35.8 ±11.8 years for the conventional group and 36.7 ±12.2 years for the ultrasound group. Male patients made up a larger proportion of the patient populations in both groups, with group C having a male to female ratio of 20:10 and group US having a ratio of 17:13. As a result, both groups can be compared. Our findings are analogous to those of Honnannavar et al. [13], who also found no discernible difference in age or gender.

Cardiovascular perioperative parameter

Regarding the pattern of variations in pulse rate, systolic blood pressure, and diastolic blood pressure during surgery, there were no notable differences between the research groups. At 4 minutes, 4.5 minutes, 5 minutes, 6 minutes, 7 minutes, 8 minutes, and 9 minutes, the aforementioned parameters were recorded. The p values obtained for the aforementioned variables throughout these intervals were assessed to be non-significant ($p>0.05$).

Heart rate, systolic blood pressure, and diastolic blood pressure were comparable between the study groups (ultrasound vs. conventional) and did not change significantly in the intraoperative or postoperative period ($p>0.05$), according to Gajendra Singh et al studies comparing ultrasound guided versus conventional supraclavicular block [17]. The effectiveness of an ultrasound-guided method and a nerve stimulator-guided supraclavicular block were compared by Kapral et al. Furthermore, there is no discernible difference in hemodynamics across the groups in this investigation. The findings of the studies described above on the hemodynamic variables were in agreement with our study [18].

Time taken for the procedure

In our study, the average time for an ultrasound-guided supraclavicular block was 5.43±1.11 minutes, compared to 4.83±0.5 minutes for a conventional technique. It had a p value of 0.01. As a result, the conventional method is much quicker to execute than the ultrasound-guided method ($p<0.05$). This study demonstrates that the traditional method is more technically viable than the ultrasonic method. The varied sonoanatomy, difficulties in positioning the shaft and tip of the needle longitudinal to the probe, and difficulty in maintaining the probe at one location were shown to be the causes of the ultrasound guided technique's time delay.

A research comparing conventional and ultrasound-guided supraclavicular blocks was undertaken by Gajendra Singh et al. They came to the conclusion that the average time required for an ultrasound-guided supraclavicular block was 10.1±1.15 minutes, compared to 5.43±1.45 minutes for a traditional approach. The conventional method is likewise much quicker in this investigation than the ultrasound-guided method ($p<0.0001$). This matches our study more closely. In their study to contrast ultrasound with the traditional method of supraclavicular brachial plexus block, Veeresham et al. [19] discovered that the average procedure duration was 5.37±1.45 minutes in the conventional group against 9.97±2.44 minutes in the ultrasound group ($p<0.0001$).

The above fits with what we found in our investigation. However, Stephan William et al. discovered that the operation duration for the nerve stimulator approach was 9.8 minutes while the ultrasound guided technique took 5.0–2.4 minutes. Contrary to our research, this. They noted in their study that the time taken to identify and mark the anatomy for the nerve stimulator technique was the cause of the time delay in the nerve stimulator group [20].

Onset of sensory block

In group C, the mean time for the start of sensory blocking was 11.214.22 minutes, but in group ultrasound, it was 93.44 minutes. Minimum sensory blockade onset durations in the conventional group and US group were 5 and 4.5 minutes, respectively, whereas maximum onset durations in the conventional group were 17 and 15 minutes, respectively. A p value of 0.02 ($p < 0.05$) indicated that there was a statistically significant difference between the two groups. This might be because ultrasound technology allows for direct visualisation of structures. According to Sivashanmugham et al investigation's intrafascial injection of local anaesthetic solution induced blockage more quickly than extrafascial injection [21]. Sahu et al. found that the onset of blockage in the lateral route was substantially quicker than in the subclavian perivascular approach. When compared to the subclavian perivascular method, more of the plexus receives an initial drug deposit as a result of the needle's placement and travel being parallel to the plexus's course [22]. Shweta S. Mehta et al. found that the ultrasound guided technique considerably accelerated the onset of sensory blocking (6.64±0.89 minutes) compared to the traditional nerve stimulator technique (9.64±1.14 minutes). This agrees with our research, which found that the ultrasound group took 5.47 minutes, but the nerve stimulator group took 5.90 minutes. This accompanied our research [23].

Onset of motor blockade

In groups C and US, the mean time for the onset of motor block was respectively 11.05 and 4.19 and 8.26 and 1.89 minutes. The minimum onset minutes of motor blockage in both groups were 6 minutes, whereas the highest onset minutes in the US group were 16 minutes and 20 minutes, respectively, for the conventional group. When compared to group Conventional, group US's time for the onset of motor block was much quicker ($p=0.001$). It became clear that the motor block manifests itself substantially more quickly in the ultrasound group than in the conventional group. In contrast to nerve stimulation, Mithun Duncan et al. discovered that ultrasound guided approach has a quicker onset of motor block. This agrees with the findings of our investigation [24]. In a study, Shweta S. Mehta et al. compared the effectiveness of the peripheral nerve stimulator approach with that of an ultrasound-guided supraclavicular block. In their investigation, the mean time for the onset of motor block was 10.1±1.14 for the ultrasound group and 12.18±1.48 for the nerve stimulator group. It agrees with the findings of our investigation [74]. In their investigation, Veeresham et al. discovered that the ultrasound group's sensory block lasted longer (444.16±116 minutes) than the conventional group's (393.2±95.33 minutes). It is comparable to our research [19].

Duration of Motor and sensory blockade

In the conventional group, the mean duration of sensory blocking was 331.06±50.08 minutes, whereas in the US group, it was 298.7±42.4 minutes. In the conventional group and the US group, the sensory blockade prolonged between less than 260 minutes and 252 minutes, respectively, while in the conventional group the highest length of the sensory blockade was 410 minutes and in the us group it was 425 minutes. At a p value of 0.009 ($p< 0.05$), the difference between the two groups was statistically significant. While the mean time for the duration of motor blockade in groups Conventional and US was 323.16±48.2, and 284.2±38.5 minutes, respectively. With a p value of 0.001 ($p<0.05$), the difference between the two groups was statistically significant in terms of the length of the motor blockade.

The duration of motor blockage was substantially longer in the US group (343.45 ± 60.84 minutes) than in the

paresthesia group (305.19 ± 60.08 minutes) in the study by Gajendra Singh et al. using the identical medication combination. Corresponding to this, they demonstrated that in Group 1 (US), the mean time of sensory blocking was 397.931 min and in Group 2, it was 352.22. Our investigation [18] and the length of this are consistent.

Complications

One patient suffered a subclavian artery vascular puncture out of the 30 instances in the ultrasonography group, but it healed up quickly. In the ultrasonography group, there was no evidence of pneumothorax, nerve damage, or local anaesthetic toxicity. Six of the 30 patients in the conventional group experienced vascular punctures, while the other 24 had no clinically evident complications. In this group, no further complications emerged. With a p value of 0.16 ($p>0.05$), the difference between the two groups was not statistically significant.

In the blind paresthesia approach, Raizada et al. reported 5 occurrences of hematoma formation among 60 patients, which went away in 3–4 days [25]. Hematoma with a 22 G huber point needle is reportedly uncommon, according to Winnie and Collins [26]. In 15 out of 66 patients, Chethananda et al. reported puncturing a subclavian vessel using the subclavian perivascular approach without any hematoma formation or other significant problems [27].

In their investigation of 1321 patients, Yuan JM et al. found that ultrasound reduced the likelihood of full hemi diaphragmatic paresis and the rate of vessel puncture. When compared to standard paresthesia approach, Gajendra singh et al. [18] and Veeresham et al. [19] also noted a notable decrease in the incidence of vessel puncture. In our investigation, the differences in complications between the conventional and ultrasound groups were statistically negligible.

Supplementation

In the conventional group, 6 out of 30 patients required analgesic support during surgery, compared to 1 out of 30 patients in the US group. With a p value of ($p = 0.04$), the need for analgesics was substantially lower in the ultrasound group than in the conventional group. For the supraclavicular brachial plexus block, Williams et al. compared ultrasonography and nerve stimulator. They reported that in the US Group, 85% of blocks (surgical anaesthetic) could be successfully achieved without supplementation, compared to 78% in the nerve stimulator Group. About 0% and 8%, respectively, of US and NS patients needed general anaesthesia [27]. According to the current study, out of 30 patients in the ultrasonography group, 24 blocks (80%) were entirely successful; two blocks (6.66%) required supplementation; and four blocks (13.3%) were unsuccessful and need general anaesthesia. Twenty blocks (66.66%) of the thirty patients in the conventional group had perfect success; four (13.2%) needed supplementation; six (20%) failed; and six (20%) required general anaesthesia.

Conclusion

We draw the conclusion from our study that, when compared to the conventional subclavian perivascular technique, the ultrasound-guided supraclavicular block for upper limb surgeries has a higher success rate with fewer complications and a quicker onset of both sensory and motor blockade. It also has a longer duration of blockade. The ultrasound guided technique requires a less time to execute than the conventional method. In terms of cost-effectiveness, peripheral nerve blocks offer acceptable levels of anaesthesia and analgesia while avoiding the drawbacks of general anaesthesia. For surgeries on the upper extremities, a US-guided approach can be used to deliver the same standard of surgical anaesthetic with no major drawbacks.

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