

ORIGINAL RESEARCH

Analysis of Efficacy of Combined Supraclavicular-Interscalene Block versus Interscalene Block Under Ultrasound Guidance for Humerus Shaft Fracture Surgery at a Tertiary Care Hospital

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ABSTRACT

Background: The present study was undertaken for comparing the efficacy of combined Supraclavicular-Interscalene Block versus Interscalene Block Under Ultrasound Guidance in Patients Undergoing Humerus Shaft Fracture Surgery. **Materials & Methods:** A total of 50 patients of ASA group I & II within the age range of 20 to 60 years were enrolled. Group A: Patients who received combined Supraclavicular-Interscalene Block and Group B: Patients who received Interscalene Block. Both performed with the use of ultrasound localization. The stimulating needle was inserted perpendicular to the skin's surface and pointed toward the suspected nerve structures for both blocks, which allowed for the best possible visualization of the vascular and neurological systems. All the results were recorded in Microsoft excel sheet followed by statistical analysis. **Results:** Mean procedural time among patients of group A and group B was 212.7 seconds and 192.3 seconds respectively. non-significant results were obtained while comparing the degree of sensory block. However, while comparing the degree of ulnar motor block in between the study groups, significant results were obtained. Non-significant results were obtained while comparing duration of anaesthesia & postoperative analgesia (mins). **Conclusion:** Under ultrasound supervision, brachial plexus blocks can be used in conjunction to safely limit the need for analgesic and anesthetic drugs in order to achieve complete upper extremity pain relief following surgery without putting the patient at further risk of local anesthetic toxicity.

Key words: Supraclavicular-Interscalene, Ultrasound Guidance.

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INTRODUCTION

A direct blow commonly causes fractures that occur in the middle third of the shaft of the humerus. Humeral shaft fractures account for about 3% of all fractures. These fractures are classified based on their location, open or closed status and the type of fracture line. The majority of humeral shaft fractures are unstable but non-surgical treatment is the standard of care.^{1, 2} Fractures of the humerus shaft are relatively common, with an annual incidence rate varying from 12.0 and 23.4 fractures per 100,000 people and an increasing incidence with age. Most fractures of the humeral shaft can be managed conservatively. The indications for operative treatment include open

fracture, pathological fracture, polytrauma, fracture with radial nerve or vascular injury, and failed non-surgical treatment leading to delayed or nonunion.^{3, 4} Stabilization surgery is recommended for clavicular fractures as it results in a high surgeon and patient satisfaction and early mobilization. Although regional anesthesia techniques such as the superficial cervical plexus blocks (SCPB), the combined SCPB and deep cervical plexus block, and the interscalene brachial plexus block (ISB) are utilized to provide anesthesia and effective postoperative analgesia for clavicular surgery, existing data is not sufficient to enable favoring the best technique. During arthroscopic shoulder surgery, selective

supraclavicular nerve block (SNB) has been reported to decrease the pain radiating over the acromioclavicular region when administered concomitantly with ISB.⁵⁻⁷

Hence; under the light of above-mentioned data, the present study was undertaken for comparing the efficacy of combined supraclavicular-interscalene block versus interscalene block under ultrasound guidance in patients undergoing humerus shaft fracture surgery.

MATERIALS & METHODS

The present study was conducted in Department of Anesthesia & Critical Care, World College of Medical Sciences Research and Hospital, Jhajjar, Haryana (India) for comparing the efficacy of combined supraclavicular-interscalene block versus interscalene block under ultrasound guidance in patients undergoing humerus shaft fracture surgery. A total of 50 patients of ASA group I & II within the age range of 20 to 60 years were enrolled. Complete demographic and clinical details of all the patients was obtained. Only those patients were enrolled who were scheduled to undergo Humerus Shaft Fracture Surgery. All the subjects were randomly divided into two study groups with 25 patients in each group as follows:

Group A: Patients who received combined Supraclavicular-Interscalene Block and

Group B: Patients who received Interscalene Block.

Both performed with the use of ultrasound localization. The stimulating needle was inserted perpendicular to the skin's surface and directed towards the nerve bundles under the USG guidance and 25ml of 0.5% bupivacaine is injected after negative aspiration check under direct vision. Twenty minutes after the local anesthetic was injected, an anesthesiologist not engaged in the Brachial plexus block assessed the degree of motor and sensory blocking. The sensory blocking of the shoulder's C5 to T1 dermatomes was assessed using an alcohol swab, ranging from 0 (loss of cold sensitivity) to 100 (intact sensation). All the results were recorded in Microsoft excel sheet followed by statistical analysis. Student t test and chi-square test were used for evaluation of level of significance.

RESULTS

Among the patients of Group A and Group B, mean age was 51.7 years and 56.3 years respectively. Majority proportion of patients of both the study groups were males. Mean procedural time among patients of group A and group B was 212.7 seconds and 192.3 seconds respectively. non-significant results were obtained while comparing the degree of sensory block. However, while comparing the degree of ulnar motor block in between the study groups, significant results were obtained. Non-significant results were obtained while comparing duration of anaesthesia & postoperative analgesia (mins).

Table 1: Comparison of operative variables

Variables		Group A	Group B	p-value
Procedural time (seconds)		212.7	192.3	0.338
Degree of sensory block	C5	0	0	0.124
	C6	0	0	
	C7	0	0	
	C8	12	13	
	T1	13	12	
Degree of ulnar motor block		0 (0 to 1)	2 (2 to 3)	0.001 (Significant)

Table 2: Comparison of analgesic variables

Variables	Group A	Group B	p-value
Duration of surgery (mins)	135.8	143.6	0.62
Duration of anaesthesia & postoperative analgesia (mins)	418.1	389.2	0.33

DISCUSSION

Humeral shaft fractures (HSF) are relatively common, representing approximately 1% to 5% of all fractures. The annual incidence ranges from 13 to 20 per 100,000 persons and has been found to be higher with age. HSF have a bimodal age distribution with the first peak seen in men aged 21 to 30 years following high-energy trauma, commonly resulting in comminuted fractures with associated soft tissue injuries. The second peak is witnessed in women aged 60 to 80 years, typically following low-energy trauma.⁷⁻⁹ Postoperative analgesia after shoulder surgery constitutes a challenge in patients with preexisting pulmonary pathology, as interscalene

brachial plexus block (ISB), the standard nerve block for shoulder surgery, carries a prohibitive risk of hemidiaphragmatic paralysis (HDP). A recent Daring Discourse identified several possible diaphragm-sparing alternatives to ISB: combined axillary-suprascapular blocks, combined infraclavicular suprascapular blocks, and small-volume supraclavicular brachial plexus block (SCB). Two recent trials (combined n = 129) have compared ISB with combined axillary/suprascapular blocks and concluded that ISB results in decreased pain and lower opioid consumption in the postanesthesia care unit (PACU), as well as improved patient satisfaction at 6 hours.¹⁰⁻¹²

Among the patients of Group A and Group B, mean age was 51.7 years and 56.3 years respectively. Majority proportion of patients of both the study groups were males. Mean procedural time among patients of group A and group B was 212.7 seconds and 192.3 seconds respectively. non-significant results were obtained while comparing the degree of sensory block. Onur Balaban et al reported their experiences regarding the implementation of the ultrasound-guided combined interscalene-cervical plexus block (CISCB) technique as a sole anesthesia method in clavicular fracture repair surgery. During the performance of each block, the block areas were visualized by using a linear transducer, and the needles were advanced by using the in-plane technique. Block success and complication rates were evaluated. 12 patients underwent clavicular fracture surgery. Surgical regional anesthesia was achieved in 100% of blocks. None of the patients necessitated conversion to general anesthesia during surgery. There were no occurrences of acute complications. The ultrasound-guided combined interscalene-cervical plexus block was a successful and effective regional anesthesia method in clavicular fracture repair.¹³ However, while comparing the degree of ulnar motor block in between the study groups, significant results were obtained. Non-significant results were obtained while comparing duration of anaesthesia & postoperative analgesia (mins).

CONCLUSION

Under ultrasound supervision, brachial plexus blocks can be used in conjunction to safely limit the need for analgesic and anesthetic drugs in order to achieve complete upper extremity pain relief following surgery without putting the patient at further risk of local anesthetic toxicity.

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