



EFFICACY OF SINGLE SHOT INTERSCALENE BLOCK FOR CLAVICLE FRACTURE IN ZENUS HOSPITAL

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ABSTRACT

An interscalene block (ISB) is a technique for anesthesia to the shoulder and lateral regions of the arm and forearm which contribute anesthesia and analgesia of the part supplied. After axillary blocks, ISB is the second most common upper extremity peripheral nerve block performed in outpatient settings. This retrospective cohort study involving 45 participants who performed interscalene block for clavicle surgery in Zenus Hospital and Research Centre Pvt. Ltd. from 14th April 2017 to 16th Dec 2019 was carried out to determine the efficacy of single shot interscalene block. Different tools and technique for the study include patient's information from hospital record (pre-operative checklist and post-operative observation). 24 hour post-operative NSAIDs or opioid consumption record was obtained from patient's treatment record which assisted to evaluate the efficacy of anaesthesia. Accuracy of block were measured in three categories as adequate, partial and failed. The study explore that among 45 participants, who had underwent clavicle surgery among them 40 (88.9%) males whereas 5 (11.1%) were females. The block success rate was 80%. No any side effects or complications were observed in any of the case. Only 1 (2.2%) respondent was found consuming opioid in 12 hours post-operative period. It revealed no complaints of post-operative pain in any of the participants except the 1 (2.2%) respondents who was prescribed with opioid analgesic in 12 hours post-operative pain. None of the patients were observed complications and the block success rate was found to be (80%) with complete block and (20%) with partial block. Hence, single shot interscalene block is effective technique for clavicle surgery.

KEYWORDS: Efficacy, interscalene block, clavicle fracture.

INTRODUCTION

The prevalence of clavicle fractures is reported (2-5%) in adults, children (10-15%) and represent the (44-66%) of all shoulder fractures.^[1] Mostly, males are affected approximately 70% has been reported. The maximum (69-82%) of fractures occur in mid shaft of clavicle, (12-26%) in the lateral part and (2-6%) in the medial part.^[2, 3] Females show higher prevalence in the sixth decade of life as a result of osteoporosis. The various causes of clavicle fracture includes moderate to high-energy mechanisms such as motor vehicle accidents or sports injuries in younger individuals and sequelae of a low-energy fall in elder individual.^[4]

Clavicle surgery is usually performed under general anesthesia. There are minimum reports concerning regional anesthesia for surgery of the clavicle however, peripheral nerve blocks are most prevalent for a wide variety of surgical procedures on the upper extremity.^[5]

An interscalene block (ISB) is a technique for anesthesia to the shoulder and lateral regions of the arm and forearm which contribute anesthesia and analgesia of the part supplied. The process involves injection of local anesthetic to block the brachial plexus. After axillary blocks, ISB is the second most common upper extremity peripheral nerve block performed in outpatient settings. More than 60% administer ISBs in their practice, and these respondents expected the use of this block to increase over time was reported by the study of anesthesiologists in the United States.^[6]

The block benefits due to the complete block of pain impulses to the central nervous system, supplying significant pain relief when a patient wakes from surgery, in that way decreasing his or her length of stay in the postoperative care unit the interscalene blocks are favored by some clinicians. Maximum studies reported improvements in patient satisfaction and comfort.^[7]

Moreover, various studies observed there is less intraoperative blood loss while using ISB as compared to general anesthesia. ISB may also decrease or prohibit physiological responses interrelated with inadequately treated pain, such as increased sympathetic nervous system activity and increased production of antidiuretic hormone, cortisol, glucagon, aldosterone, and catecholamines. ISB enhances shoulder mobility in the immediate postoperative period, facilitating physical therapy. A 25% increase in the number of ISBs administered has been reported over 5 years. Probably, ISBs are widely being accepted.^[6]

Bupivacaine and ropivacaine are most frequently practiced local anesthetics (amide linked anaesthetics) which are long-acting (4–18 hours). The patient can expect pain relief and limb heaviness for the duration of local anesthetic action when the local anesthetic is administered.^[8]

There are few studies on the efficacy of single shot interscalene block for clavicle fracture. So, the study was conceptualized with a purpose to determine the efficacy of single shot interscalene block for clavicle fracture in Zenus Hospital.

METHODS

A retrospective cohort study who have got surgical procedure done for clavicle in Zenus Hospital and Research Centre Pvt. Ltd. from 14th April 2017 to 16th Dec 2019 was measured as sample size of the study. Ethical approval was taken from Nepal Health Research Council, Kathmandu. Respondents who undergone the clavicle surgery, agreed to sign informed consent and willed to take part in the study were included in the study. Similarly, patients receiving chronic analgesic therapy, neuropathy, neurologic disorders such as stroke and Parkinson disease, severe broncho pulmonary disease, chronic opiate use or contraindications to interscalene blocks including allergies to lignocaine or bupivacaine were excluded in the study. The subject was assured for the anonymity and confidentiality of the information.

RESULTS

Table 1: Demographic profile of respondents (n=45)

Variables	Category	Frequency (n)	Percentage (%)
Age of respondents	18-30	15	33.3
	31-43	17	37.8
	44-56	10	22.2
	57 and above	3	6.7
Gender	Male	40	88.9
	Female	5	11.1
Ethnicity of respondents	Brahmin	14	31.1
	chhettri	9	20
	Indegenous tribe	14	31.1
	Dalit	2	4.4
	Others	6	13.3
Alcohol consumption	Regular	11	24.4

Different tools and technique for the study include patient's information from hospital record (pre-operative checklist and post-operative observation). Demographic data including age, gender, ethnicity, alcohol consumption and ASA physical status were recorded. A diagnosis of a pre-existing disease conditions such as asthma, chronic obstructive pulmonary disease, diabetes, hypertension was noted.

Pain scale was used for measuring pain intensity which helps to determine severity and duration of pain. 24 hour post-operative NSAIDs or opioid consumption record was obtained from patient's treatment record which assisted to evaluate the efficacy of anaesthesia.

A total of 30 ml local anaesthesia mixture was made with 21 ml of 0.5% bupivacaine, 9 ml of 2% lignocaine with adrenaline and water for injection in three 10 ml syringe. Landmark and nerve stimulator technique was used for anaesthesia. 500ml normal saline or ringer lactate bottle is placed at interscapular region for the extension of neck, with the head slightly turned away from the side being blocked and patient is asked to raise the neck. After locating the groove 10ml syringe beveled is inserted to the location at an angle of 30 degree to skin and 30ml of local anaesthesia is injected. After completion of injection bottle from interscapular region is removed and head is placed to the centre. The needle gauge and bevel, and local anesthetic solution and volume was noted. These data are routinely recorded as part of our anesthesia block record. Supplementation of the plexus block distally by the anesthesiologist or surgeon was noted. Accuracy of block were measured in three categories as adequate, partial and failed. Success rate, defined as the ability to proceed surgically without supplementation of additional local or general anesthesia, was determined. Assessment of block was done with pinching with forcep around the clavicle region. Loss of pain with pinching is considered as adequate block. The block was considered to be failed if the block was not completed 15 min after the injection. Time to first analgesic was recorded. The postoperative course was reviewed for neurologic and pulmonary complications.

	Irregular	12	26.7
	Occasional	3	6.7
	No consumption	19	42.2
Mechanism of injury	Road traffic accident (RTA)	37	82.2
	Fall from height	7	15.6
	Slipping	1	2.2
ASA physical status	I	24	53.3
	II	21	46.7

The demographic characteristics of respondents are summarized in Table 1. Total 45 patients had undergone clavicle surgery from 14th April 2017 to 16th Dec 2019. Among 45 respondents maximum no 40 (88.9%) of patients were male whereas 5 (11.1%) were females. Similarly, highest no of respondents 17 (37.8%) were found in 31-43 age groups. Likewise, 15 (33.3%) were found in 18-30 age groups. Lowest no 3 (6.7%) of respondents were observed in 57 and above age groups.

In our study, Brahmin and Janajati tribes 14 (31.1%) were equally found whereas Chettri were observed 9 (20%). The lower number of people were observed in Dalit tribes i.e 2 (4.4%). Most of the patients 19 (42.2%)

were found who didn't consumed alcohol whereas 15 (33.3%) found consuming alcohol irregularly/occasionally and 11 (24.4%) found taking alcohol regularly.

Similarly, in the distribution of mechanism of injury maximum number of participants 37 (82.2%) were from Road traffic accidents, 7 (15.6%) fall from height whereas 1 (2.2%) from slipping were observed in our study. Respondents ASA physical status was also observed. 24 (53.3%) were found in ASA category I whereas 21 (46.7%) were seen in ASA category II in our study.

Table 2: Distribution of Efficacy of anaesthesia (n=45)

Efficacy of anaesthesia	Frequency (n)	Percentage (%)
Adequate	36	80
Partial	9	20
General anaesthesia	-	-

Table 2 represents the distribution of efficacy of anaesthesia. It was observed that among 45 respondents, 36 (80%) were performed under anaesthesia block

whereas 9 (20%) were male respondents were undergone via IV anaesthesia in clavicle surgery.

Table 3: Complications from anaesthesia.

Complications from anaesthesia	Frequency (n)	Percentage (%)
No	45	100

Table 3 shows the distribution of complications from anaesthesia of the respondents. No any complications were observed in all the subjects.

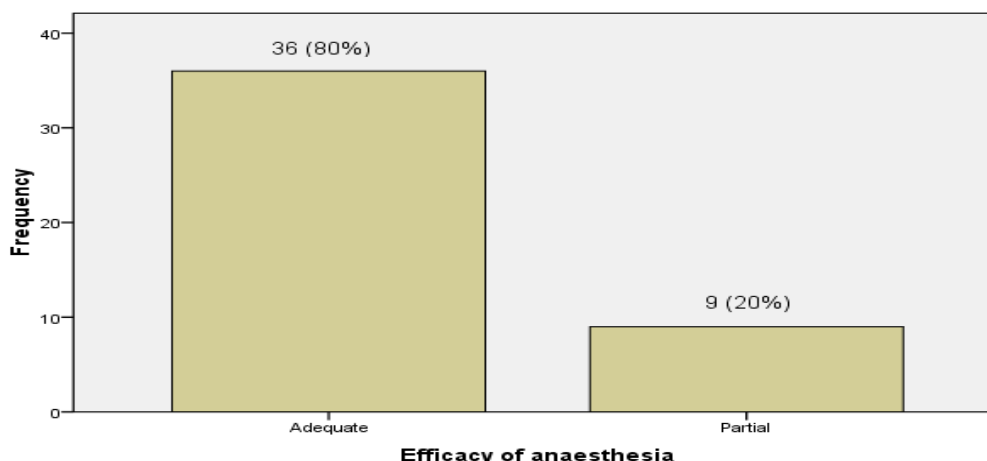


Figure 1: Distribution of respondent's efficacy of anaesthesia.

Figure 1 represents the distribution of respondent's efficacy of anaesthesia. It was observed that among 45 respondents, 36 (80%) were performed under adequate

block whereas 9 (20%) were male undergone surgery via partial block.

Table 4: Distribution of efficacy of anaesthesia regarding age, sex and alcohol consumption (n=45).

Variables	Category		Efficacy of anaesthesia			
			Adequate block		Partial block	
Gender	N	(%)	N	(%)	N	(%)
Male	40	(88.9%)	31	(77.5%)	9	(22.5%)
Female	5	(11.1%)	5	(100%)	0	
Age	18-30	15 (33.3%)	11 (73.3%)	4 (26.6%)		
	31-43	17 (37.8%)	13 (76.4%)	4 (23.5%)		
	44-56	10 (22.2%)	9 (90%)	1 (10%)		
	>57	3 (6.7%)	3 (100%)	0		
Alcohol Consumption	Regular	11 (24.4%)	6 (54.5%)	5 (45.4%)		
	Irregular	12 (26.7%)	10 (83.3%)	2 (16.6%)		
	Occasional	3 (6.7%)	3 (100%)	0		
	No consumption	19 (42.2%)	17 (89.4%)	2 (10.5%)		
Total		45	36	9		

Table 4 shows the distribution of efficacy of ISBs with different variables. A total of 45 participants including 40 (88.9%) males and 5 (11.1%) females, adequate ISB was showed in 36 (80%) whereas 9 (20%) showed partial ISB.

In the present study among 45 total patients, most of the respondents 17 (37.8%) were observed in 31-43 age group. Out of 17 respondents, 13 (76.4%) were found with adequate block and 4 (23.5%) were with partial ISB

in 31-43 age group. Among 15 (33.3%) respondents in 18-30 age groups, 11 (73.3%) were found with adequate block whereas 4 (26.6%) with partial anaesthesia.

Out of 10 (22.2%) respondents in 44-56 age groups, 9 (90%) were found with adequate block and 1 (10%) was observed with partial block. Likewise, minimum no of respondents 3 (6.7%) in 57 and above age groups, all were found with adequate block. No case was observed with partial ISB.

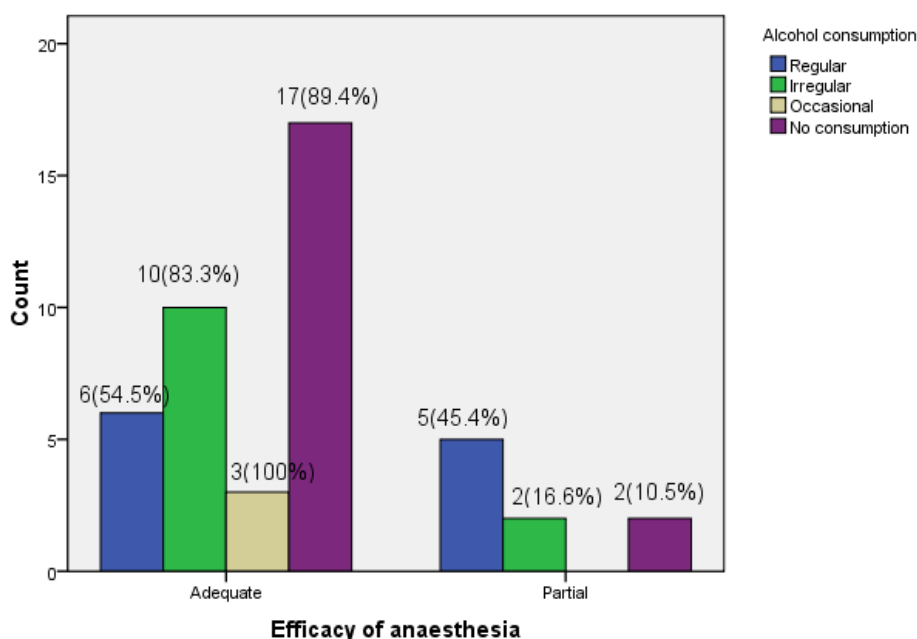


Figure 2: Distribution of respondent's efficacy of anaesthesia regarding alcohol consumption.

Figure 2 shows distribution of respondent's efficacy of anaesthesia regarding alcohol consumption. It is observed that highest no of respondents 19 (42.2%) had not had the habit of taking alcohol of which 17 (89.4%)

undergone clavicle surgery with adequate block and 2 (10.5%) with partial block. Similarly, 15 (33.3%) consumed alcohol irregularly in which 13 (86.6%) had adequate block and 2 (13.3%) with partial block. Total

11 (24.4%) consumed alcohol regularly. Among which 6 (54.5%) had adequate block and 5 (45.4%) with partial block.

Table 5: Opioid consumption in 12 hour.

Opioid consumption	Frequency (n)	Percentage (%)
Tramadol	1	2.2
No opioid consumption	44	97.8

In the present study, out of 45 respondents, 1 (2.2%) respondent was found consuming opioid in 12 hours post-operative period.

DISCUSSION

The present retrospective cohort study assessed the efficacy of single shot interscalene block in clavicle surgery. Our study included 45 patients who had undergone clavicle surgery among them 40 (88.9%) males whereas 5 (11.1%) were females. The block success rate was 80%. No any side effects or complications were observed in any of the case. No complaints of pain were noted in any of the participants except the 1 (2.2%) respondents who was prescribed with opioid analgesic in 12 hours post-operative period. Interscalene block (ISB) of the brachial plexus is advantageous to patients undergoing shoulder surgery, in terms of analgesic benefits including a reduction in pain scores, opioid consumption, and postoperative nausea and vomiting.^[9,10]

Similar study was conducted by Tamosiunas R et.al, 2004, comprising seventy-three patients who undergone shoulder surgery applying interscalene block. The success rate was 97% with less side effects and high patient satisfaction. It was reported that single injection interscalene brachial plexus block is a reliable anesthetic and effective method of providing postoperative pain relief after shoulder surgery.^[11]

In a retrospective observational study by Turan Cihan Dülgeroğlu, and Tayfun Aydın, 12 patients underwent clavicular fracture surgery. Surgical regional anesthesia was achieved in 100% of blocks. There was no requirement of general anesthesia during surgery. No acute complications were occurred. The ultrasound-guided combined interscalene-cervical plexus block was a successful and effective regional anesthesia method in clavicular fracture repair which supports our present study.^[12]

Likewise, a Prospective Randomized Clinical Trial of shoulder Arthroplasty done by Hasan S.S et.al, 2019, reported that seventy-six patients were randomized to ropivacaine single-shot interscalene block or Continuous interscalene block after prosthetic shoulder arthroplasty. Postoperative pain scores and opioid use, hospital length of stay (LOS), adverse events, and catheter tip withdrawal were recorded. Pain scores and opioid use on

the first postoperative day were lower in the Continuous interscalene block group, compared to single-shot interscalene nerve block but, there was no difference in LOS. Adverse events were more common in the Continuous interscalene block group and 10% of catheters pulled out prematurely.^[13] Similarly, another study by VJ Sabesan et.al, 2016, compared the two groups of shoulder arthroplasty, one treated with Liposomal Bupivacaine and another with Continuous Peripheral Nerve Block and observed that patients receiving Continuous interscalene block had increased pain levels and a longer Length of stay.^[14] Whereas, another prospective randomized study conducted by KR Okorooha et.al, 2016, revealed that local liposomal bupivacaine provides similar overall pain relief as that of Interscalene nerve block, with no increase in complications or length of stay and a decrease in narcotic requirements on the day of surgery.^[15]

CONCLUSION

Our study revealed the efficacy of single shot interscalene block in clavicular surgery and revealed no complaints of post-operative pain in any of the participants except the 1 (2.2%) respondents who was prescribed with opioid analgesic in 12 hours post-operative pain. None of the patients were observed complications and the block success rate was found to be (80%) with complete block and (20%) with partial block. Further comparative studies are required to study the benefits and accuracy of block, longer effects and complications rate, long term post-operative pain, hospital length of stay.

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