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A COMPARATIVE ANALYSIS BETWEEN USG GUIDED INTERSCALENE BRACHIAL PLEXUS BLOCK WITH SUPERFICIAL CERVICAL PLEXUS BLOCK VERSUS GENERAL ANAESTHESIA FOR CLAVICLE FRACTURE SURGERY.

Anaesthesiology

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ABSTRACT

Background: Clavicular surgeries have traditionally been performed under general anaesthesia due to inability to access the airway intraoperatively, position during surgery and complications of blind interscalene brachial plexus block. Upper extremity surgeries are being routinely carried out under peripheral nerve block. However, only a few case reports of clavicular surgeries being performed successfully under regional anaesthesia that consist of interscalene brachial plexus block combined with superficial cervical plexus block are present. **Materials and Methods:** In our study total 60 patients between 18 to 60 years old ,ASA class I and II undergoing clavicular surgeries were randomly and equally divided into Group B and Group G. Group B received ultrasound guided interscalene brachial plexus block with superficial cervical plexus block. In patients with Group G received general anaesthesia while those in Group B received interscalene brachial plexus block with superficial cervical plexus block **Results:** Average PR, SBP,DBP were more significant in group G as compared with group B immediate post-operatively [$p<0.05$]. Patient having complain of pain was significantly higher in Group G as compared to Group B[$p<0.05$].The incidence of postoperative nausea and vomiting was significantly higher in group G as compared to Group B [$p<0.05$]. **Conclusion:** From our study we conclude that USG-guided interscalene brachial plexus block with superficial cervical plexus block is superior to general anaesthesia in intraoperative period as well as postoperative period in patient undergoing clavicle fracture surgery.

KEYWORDS

interscalene brachial plexus block with superficial cervical plexus block. General anaesthesia. Ropivacaine.

INTRODUCTION:

Clavicular surgeries have traditionally been performed under general anaesthesia due to inability to access the airway intraoperatively, position during surgery and complications of blind interscalene brachial plexus block. [1]Upper extremity surgeries are being routinely carried out under peripheral nerve block. However, only a few case reports of clavicular surgeries being performed successfully under regional anaesthesia that consist of interscalene brachial plexus block combined with superficial cervical plexus block are present [2]. With the advent of ultrasound- guided technology in interscalene brachial plexus block, efficacy and safety have significantly improved and complication have decreased[3,4] . The cervical plexus is formed by the ventral rami of C1-C4 cervical roots. It can be blocked at the superficial, intermediate and at deep levels[5].The superficial cervical plexus block results in anaesthesia of skin over the anterolateral neck, skin over clavicle and sternoclavicular joint, and anterior auricular and retroauricular areas.[5,6] Blocking superficial cervical plexus involves field block by subcutaneous injection of local anaesthetic.[7] Ultrasound-guided interscalene brachial plexus block has lead to greater precision in blocking the plexus by visualization of needle, the plexus and surrounding structures[8] Previous study has been shown that the time duration between start of anaesthesia to the incision was significantly more in patient receiving interscalene block with superficial cervical plexus block than general anaesthesia .

This finding correlates with studies that compared interscalene block for shoulder arthroscopy with general anaesthesia[9] and compared interscalene brachial plexus block with general anaesthesia.[10] Hence, in our study an attempt was made to evaluate the efficacy of ultrasound-guided interscalene brachial plexus block along with superficial cervical plexus block compared to general anaesthesia in various parameters.[3]

Methodology:

Our study was conducted in Swaroop Rani Nehru Hospital ,Moti Lal Nehru Medical College, Prayagraj over a period of one year [August 2021 to July 2022] after the Ethical Committee approval. Total 60 patients between 18 to 60 years old of ASA class 1&2 scheduled for clavicular surgery were taken and equally divide into two group , Group G and Group B.

Group G -Received general anaesthesia.

Group B-Received ultrasound guided interscalene brachial plexus block with superficial cervical plexus block.

Inclusion Criteria:

1. Age between 18-60 year.
2. Patients are either gender.
3. ASA grade 1 and 2.
4. Having normal sensory and motor function of affected side arm.

Exclusion Criteria:

1. Patients who refused to give informed consent.
3. Patient belonging ASA physical status >3 or=3.
4. Patient having coagulopathies disorder.
5. Local site infection.
6. History to allergy to any study drugs.
7. Blood dyscrasias.
8. Alcohol, narcotics abuse, previous opioid therapy.
9. Patient having severe obstructive and restrictive lung disorder.

Group B:

These patients received in plane ultrasound-guided combined interscalene brachial plexus block with superficial cervical plexus block. The patient was placed in supine position with slight elevation of head end with head turned away from the side to be blocked. Skin was prepared using antiseptic solution, and transducer was wrapped in sterile cover. The brachial plexus at the interscalene groove was identified either by distal to proximal approach or by medial to lateral approach. A short bevel 50mm, 21G insulated nerve stimulator needle was used by an in-plane approach from lateral to medial. 20ml of local anaesthetic consisting of 10ml of 2% lignocaine with adrenaline along with 10ml of 0.5%ropivacaine was given and spread of local anaesthetic was be seen. The superficial cervical plexus block by ultrasound guided technique with the transducer over the midpoint of the posterior border of sternocleidomastoid muscle. Probe being kept in transverse position, an inplane approach was made. needle was positioned under the sternocleidomastoid muscle below the prevertebral fascia, where10ml of local anaesthetic mixture consisting of 5ml of lignocaine with adrenaline and 5ml of 0.5% ropivacaine was

injected. Block was assessed after 15 minute. Motor blocked was assessed by the shoulder abduction and fixation, sensory blocked was assessed by the loss of sensation to cold over relevant dermatomes and pinprick sensation at the surgical site. In case of failed block patient were excluded from the study and then it was converted into General Anaesthesia.

Group G:

Patients was receive general anaesthesia with premedication injection Ranitidine 1mg/kg i.v., injection Glycopyrrolate0.005 mg/kg i.v., injection Midazolam 0.007mg/kg i.v. and injection Fentanyl 2µg/kg i.v. . Induction with injection propofol 1.5 mg/kg i.v. Intubation was facilitated by the use of injection Vecuronium 0.08mg/kg i.v. anaesthesia was maintained by Isoflurane and intermittent injection Vecuronium 0.01 mg/kg i.v. . Injection Paracetamol 100 ml i.v. was given 30 minute after incision. All patients received injection Ondansetron 0.1 mg/kg just before Reversal. Extubation will be performed when the patient was breathing spontaneously and was fully awake . Patient was then transferred to post anaesthesia care unite where the patient was monitored in propped-up position.

The following observation was made postoperatively:

- Heart rate monitoring
- Blood pressure monitoring
- Oxygen saturation(SpO2) monitoring
- Respiratory rate
- Complication if any postoperatively

OBSERVATION & RESULT

Table no. 1 Demographic data of the groups

		Group B	Group G	p-value	Statistical Significance
Gender	F	8(26.7%)	9(30%)	0.99 (Chi-square test)	Not significant
	M	22(73.3%)	21(70%)		
Mean (SD) Age (in year)		40.8(12.1)	42.8(9.8)	0.4933 (t-test)	Not significant
Mean (SD) Weight (in Kg)		70.8(7.1)	73.5(9.5)	0.23 (t-test)	Not significant
Mean (SD) Duration of Surgery (in Min.)		52.2(6.4)	51.7(7)	0.7735 (t-test)	Not significant
Mean (SD) Duration of Anesthesia (in Min.)		83(6.6)	66.7(8.1)	0.0001 (t-test)	Significant
ASA Grade	I	28(93.3%)	27(90%)	0.99 (Chi-square test)	Not significant
	II	2(6.7%)	3(10%)		

From table no.1 Demographic data like Gender,Mean age,Wieght, ASA class and Mean duration of surgery were comparable between both group with no significant different.

The average (SD) duration of anesthesia (in Min) was 83 (6.6) in Group B while 66.7 (8.1) in Group G and both the groups are differ significantly to each other as the p-value of t-test (0.0001) is less than 0.05.

Table no. 2 Mean (SD)/Percentage of immediate post-operative vitals and their significance

Parameter		Group G	Group G	p-value & statistical significance
Pulse rate (PR)		78.3(7.1)	93.8(6.5)	0.03×10-10 (Significant)
SBP		126.2(8.4)	152.7(6.7)	.03×10-17 (Significant)
DBP		82.1(5)	92.5(2.9)	0.04×10-11 (Significant)
SPO2		99(0.2)	99(0)	0.3256 (Not Significant)
PONV	No	30(100%)	25(83.3%)	0.03142 (Significant)
	Yes	0(0%)	5(16.7%)	
C/O Pain	No	30(100%)	0(0%)	0.00000 (Significant)
	Yes	0(0%)	30(100%)	

From table no. 2 it was observed that pulse rate , systolic blood pressure, diastolic blood pressure, incidence of postoperative nausea and vomiting and complain of pain wasc significantly higher ($p<0.05$) in Group G as compared to Group B.

Table no. 3 Frequency (percentage) of post-operative nausea and vomiting in patients between the groups and their significance

Time	Result	Group B	Group G	p-value & statistical significance
1 Hour	No	30(100%)	28(93.3%)	0.472 (Not Significant)
	Yes	0(0%)	2(6.7%)	
2 Hours	No	29(96.7%)	21(70%)	0.01531 (Not Significant)
	Yes	1(3.3%)	9(30%)	
4 Hours	No	27(90%)	23(76.7%)	0.2987 (Not Significant)
	Yes	3(10%)	7(23.3%)	
6 Hours	No	28(93.3%)	28(93.3%)	0.999 (Not Significant)
	Yes	2(6.7%)	2(6.7%)	
8 Hours	No	30(100%)	28(93.3%)	0.472 (Not Significant)
	Yes	0(0%)	2(6.7%)	
10 Hours	No	30(100%)	29(96.7%)	0.999 (Not Significant)
	Yes	0(0%)	1(3.3%)	
12 Hours	No	30(100%)	30(100%)	0.999 (Not Significant)
	Yes	0(0%)	0(0%)	

From table no. 3, it is can be seen that the cases of nausea and vomiting in Group G were either equal of more than the cases of nausea or vomiting in Group B. At the time point 1 hours, there was 02(6.7%) cases of nausea or vomiting in Group G while no any case in Group B. The cases started increasing in both the groups then after. At the highest, there were 09(30%) cases in Group G at the time point 2 hour while there was 01(3.3%) case in Group B. after this time point, the cases of nausea and vomiting started decreasing and reached at 0 cases in both the groups at the time point 12 hours. But both the groups were not significantly differ from each other at any post operative time point on the basis of cases of nausea and vomiting as all the p-values are greater than 0.05

DISCUSSION:

Our study was conducted to compare between two Group. Group G(general anaesthesia) and Group B(USG guide interscalene brachial plexus block with superficial cervical plexus block)

Immediate postoperative vitals (0 minutes)

In our study immediate poste-operative vital was stable in USG-guided interscalene brachial plexus block with superficial cervical plexus and in General anaesthesia immediate poste-operative (SBP, DBP, PR) vital was significantly high.

Our study was supported by a study done by **Swarna Banerjee et al 2019**[11]**-** they reported that in postoperative care unit , heart rate and blood pressure were significantly more in Group G probably due to higher pain scores.

In our study immediate post-operative nausea and vomiting was more significant in Group G as compared with Group B (p value 0.03142)

Postoperative Nausea And Vomiting

In our study at the time point 1 hour ,2 hour, 4 hour, 6 hour, 8 hour, 10 hour and 12hours postoperatively the incidence of PONV is higher in group G as compared to group B but both the groups were not significantly different from each other at any post operative time point on the basis of cases of nausea and vomiting as all the p-values are greater than 0.05.

A study was conducted by **HU Contractor et al**[3]**.** it was seen that in combined interscalene brachial plexus block with superficial cervical plexus block there was decreased incidence of postoperative nausea and vomiting and shorter hospital stay. Where as in general anaesthesia has disadvantage of increase incidence of postoperative nausea and vomiting and also delayed recovery . which support our study.

A study done by **Brown et al**[9]**.** also support our study that a lower incidence of complications such as nausea, vomiting, urinary retention, and overnight hospital admission after interscalene block was administered for shoulder surgery than in the general anaesthesia group.

CONCLUSION:

In our study, it was seen that there was more rise in the PR(Pulse Rate) and B.P. (Blood Pressure) and also the incidence of PONV was higher when the surgery was done under general anaesthesia as compared to USG-guided interscalene brachial plexus block with superficial cervical plexus block during immediate postoperative period. Thus we conclude that USG-guided interscalene brachial plexus block with superficial cervical plexus block is superior to general anaesthesia in intraoperative period as well as postoperative period in patient undergoing clavicle fracture surgery.

REFERENCES

1. Park SK, Sung MH, Suh HJ, Choi YS. Ultrasound Guided Low Approach Interscalene Brachial Plexus Block for Upper Limb Surgery. Korean J Pain. 2016;29(1):18-22.
2. Shrestha BR, Sharma P. Regional Anaesthesia in Clavicle Surgery. JNMA J Nepal Med Assoc. 2017 ;56(206):265-267. PMID: 28746327.
3. Contractor HU, Shah VA, Gajjar VA. Ultrasound-guided superficial cervical plexus and interscalene brachial plexus block for clavicular surgery. Anaesth Pain Intensive Care 2016;20:447-50.
4. Winnie AP. Interscalene brachial plexus block. Anaesthanalg 1970;49:455-66.
5. L. F. R. Falcão, M. V. Perez, I. de Castro, A. M. Yamashita, M. A. Tardelli, J. L. G. Amaral, Minimum effective volume of 0.5% bupivacaine with epinephrine in ultrasound-guided interscalene brachial plexus block, *BJA: British Journal of Anaesthesia*, Volume 110, Issue 3,2013, Pages 450–455.
6. Shanthanna H. Ultrasound guided selective cervical nerve root block and superficial cervical plexus block for surgeries on the clavicle. Indian J Anaesth. 2014;58(3):327-9.
7. Kim JS, Ko JS, Bang S, Kim H, Lee SY. Cervical plexus block. Korean J Anesthesiol. 2018;71(4):274-288.
8. Kumar K, GurramR.Fultambkar G, Omprakash Gupta A, Swami OC. Evaluation of ultrasound-guided versus nerve stimulator technique of interscalene brachial plexus block: Insight from Indian multi-super specialty hospital, Int J Res Med Sci2018;6:25:25503-7.
9. Brown AR, Weiss R, Greenberg C, Flatow EL, Bigliani LU. Interscalene block for shoulder arthroscopy: comparison with general anesthesia. Arthroscopy. 1993;9(3):295-300.
10. Lehmann LJ, Loosen G, Weiss C, Schmittner MD. Interscalene plexus block versus general anaesthesia for shoulder surgery: a randomized controlled study. Eur J Orthop Surg Traumatol. 2015;25(2):255-61.
11. Banerjee S, Acharya R, Sriramka B. Ultrasound-Guided Inter-scalene Brachial Plexus Block with Superficial Cervical Plexus Block Compared with General Anesthesia in Patients Undergoing Clavicular Surgery: A Comparative Analysis. Anesth Essays Res. 2019;13(1):149-154.