

Interscalene Brachial Plexus Block for Hydrodilatation with Normal Saline in Patients of Frozen Shoulder

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ABSTRACT

Objective: To observe the anesthetic efficacy and safety of interscalene brachial plexus block for hydrodilatation in patients undergoing arthrolysis for frozen shoulder. **Materials & Method:** We have done a study, at the GMERS Medical College, Vadodara, Gujarat in which fifty patients with frozen shoulder were selected for the present study. This study evaluates the clinical efficacy of interscalene brachial plexus block for hydrodilatation with normal saline in patients of frozen shoulder. Satisfaction scores with a visual analog scale, side effects, circulatory and respiratory parameters were assessed by Fast Track Criteria. **Results:** All the patients were in the age group of 40 to 60 years and showed no significant changes in heart rate and SpO₂ after anesthesia. There was a complete block during the procedure all the patients were absolutely comfortable. **Conclusion:** With the use of this regional anesthesia technique, it was possible to provide comfort, pain relief during mobilization with the gentle breaking of adhesions with high patient satisfaction.

Key-words: Frozen shoulder, Adhesive capsulitis, Interscalene Brachial plexus block, Anesthesia.

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INTRODUCTION

Frozen shoulder, which is also known as ‘adhesive capsulitis’ is a painful condition of the shoulder joint in which there is an inflammation of articular shoulder capsules, restricting the mobility of the shoulder joint. It commonly affects the people who are above the 40 years of age. The incidence of surgery for frozen shoulder in England was calculated by Kwaees and Charalambous as 2.67 procedures per 10,000 general population per year in their study, and at 7.55 for those aged 40-60.¹

Frozen shoulder can be easily diagnosed by signs, symptoms and a physical examination of the patients by doing various movements of the shoulder joint with the help of imaging techniques like X-ray and MRI.² During primary stages, these cases are treated with the help of analgesics, hot compresses and physiotherapy but at later stage injectable drugs or surgery may be required to alleviate the pain and to increase the mobility of the shoulder joint. Shoulder arthroscopy is the most common surgical procedure to remove the adhesions in cases of the frozen shoulder and various types of anesthesia methods have been suggested by various authors. The present study was conducted to evaluate the clinical efficacy of interscalene brachial plexus block for the surgical management of frozen shoulder with.

MATERIAL & METHODS

This prospective and experimental study was conducted in the department of Anesthesia, GMERS Medical College, Gotri, Vadodara, Gujarat on the patients of frozen shoulders who were managed surgically during the period of one year in 2014. Total 50 patients, who were diagnosed as a case of frozen shoulder and ready to give informed consent were selected randomly for this study. The patients of more than 40 years were taken into consideration as the severe degree of frozen shoulder occurs in old age. The patients, who was having respiratory diseases like COPD, pneumothorax, unilateral phrenic nerve palsy and myasthenia gravis were excluded from the present study. The side effects of interscalene brachial plexus block like phrenic nerve block, miosis, recurrent laryngeal nerve palsy, etc. were explained to the patients before the procedure.

The interscalene brachial plexus block was given them after proper premedication, monitoring of vital signs & securing of intravenous access. The interscalene brachial plexus block was given with 15ml of 2% Lignocaine with 15ml of 0.5% Bupivacaine and 10ml of sterile water by using modified Winnie technique in which patient lies supine with head turned slightly to the opposite side. The posterior border of sternocleidomastoid was identified at the level of the cricoid cartilage (C6). The groove between scalene anterior & medial scalene muscle palpated and at the level of C6 skin infiltrated with 2ml of 2% lignocaine hydrochloride with 5cm short bevelled needle at 30⁰ angles of the skin. Paresthesia was located at the level of shoulder and elbow joints. Head up is given and pressure applied above to prevent cranial spread of local anesthetic drugs. Effect of block was assessed by both the surgeon and anesthesiologist simultaneously. Satisfaction scores with a visual analog scale, side effect, circulatory and respiratory parameters were assessed continuously by Fast Track Criteria (According to White and Song).³

Procedure

During the procedure, 50ml of normal saline, 5ml of 0.5% Bupivacaine and 1ml of Depomedrol (Methyl Prednisolone) were taken. After locating the shoulder joint space under IITV, the injection was given. During the procedure all the 50 patients were absolutely comfortable. The injection of normal saline causes the gentle breaking of the adhesions within the joint space (due to capsulitis). Post procedure the joint space was increased compared to the previous IITV image, then the success of the procedure was assured. A Fastrack criterion > 12 was considered as acceptable.

Table-2: Fastrack Criteria-According to White and Song

CRITERIA	SCORE	GRADE
Level Of Consciousness	* Awake and oriented	2
	*Aarousable on minimal stimuli	1
	* Arousable on tactile stimuli	0
Physical Activity	* Able to move all four limbs on command	2
	* Some weakness in movement of extremities	1

	* No movement voluntarily	0
Hemodynamic Stability	* Blood pressure < 15% of baseline map value	2
	* Blood pressure 15-30% of baseline map value	1
	* Blood pressure > 30% of baseline map value	0
Respiratory Stability	* Able to breathe deeply	2
	* Tachypnoea with good cough	1
	* Dyspnoeic with weak cough	0
Oxygen Saturation Status	* Maintains > 90% on room air	2
	* Requires oxygen supplementation	1
	* < 90% with supplemental oxygen	0
Postop Pain	* None or mild discomfort	2
	* Moderate to severe pain.controlled with iv analgesics	1
	* Persistent severe pain	0
Postop Emetic Symptoms	* None or mild nausea with no vomiting	2
	* Transient nausea or vomiting	1
	* Persistent moderate to severe nausea or vomiting	0
Total		14

RESULTS

Total 50 cases were selected randomly for the present study. All the patients were between 40-60 years of age and majority of the patients were in their 7th decade of life. In the present study, Males were almost double in numbers than the females, making a male to female ratio 1.94:1. In most of the cases (82%) the etiology was unknown and only in 18% cases the frozen shoulder was associated with a history of trauma. Diabetes was associated with majority (76%) of the cases and was probably responsible for the severity of the symptoms while cardiovascular disease was found in 66% of the cases. Post procedure, manipulation was done very gently and the hand was kept under the head. Satisfaction scores with a visual analog scale, side effects, circulatory and respiratory parameters were assessed by Fast Track Criteria of White and Song,³ and observed that all the patients were comfortable and got excellent analgesia for about 8 hours after the procedure.

Table-2 Age and Sex wise distribution of the cases

Age Groups (In Years)	Male (%)	Female (%)	Total (%)
40-50 yrs	04 (08%)	01 (02%)	05 (10%)
50-60 yrs	09 (18%)	08 (16%)	17 (34%)
60-70 yrs	16 (32%)	06 (12%)	22 (44%)
> 70 yrs	04 (08%)	02 (04%)	06 (12%)
Total	33 (66%)	17 (34%)	50 (100%)

Table-3 Distribution of cases as per Etiology

Significant Associated Finding	Number of cases	Percentage
Trauma	09	18%
Not known	41	82%
Diabetes	38	76%
Cardiovascular disease	33	66%

DISCUSSION

The use of regional anesthesia in various surgical procedures is increasing because it provides more expedient recovery and subsequently more rapid discharge of the patient as compared to general anesthesia.⁴ Results of the present study show that the majority of the patients of frozen shoulder, who admitted for surgery were male in their 7th decade of life and having an associated problem of diabetes and hypertension. The use of interscalene brachial plexus block in cases of frozen shoulder surgery showed an effective analgesia during the postoperative period and there was also the absence of a sudden breakthrough in pain postoperatively, which enables the patients to undergo physiotherapy on the very same evening. This procedure was found effective to reduce the painful physiotherapy for 3 to 4 days postoperative period. All the patients were found comfortable during and after the procedure and there was a 100% patient satisfaction. The Edde & Deutsch,⁵ have reported a case of sudden cardiac arrest after the use of interscalene brachial-plexus block while transient postoperative neurapraxia and seizures were noted by Faryniarz et al.⁶ The effect of addition of interscalene block to general anesthesia was shown by Gohl et al⁷ in their study done on patients undergoing open shoulder surgeries while Fibuch et al⁸ has reported neuritis. There was no major side effect of interscalene brachial plexus block noticed in the present study. In ultrasound-guided supraclavicular brachial plexus block, complete block of the axillary nerve and dorsal scapular nerve was observed in a study done at China and the authors found that suprascapular nerve was 92.6% blocked while phrenic nerve block occurred partially in 1 case with mild local anesthetic toxicity in another.⁹ The another study shows the effects of adhesion releasing under nerve block and arthrolysis on adhesive scapulohumeral periarthritis.¹⁰ In our study, satisfactory results were obtained in almost all patients during and after the procedure, indicating the safety and feasibility of interscalene brachial plexus block for pain relief during management of frozen shoulder.

CONCLUSION

The present study shows that the interscalene brachial plexus block for hydrodilatation in patients undergoing arthrolysis for frozen shoulder is quite safe and effective and can be used as a regional anesthetic for pain relief. It provides a pain free period after the surgical procedure,

which is very important for the patient to start early physiotherapy and to do an early discharge to home with a high patient satisfaction.

Conflict of Interest: None.

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