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COMPARISON BETWEEN SUPRA-SCAPULAR NERVE BLOCK AND INTRA ARTICULAR STEROID IN PAIN MANAGEMENT FOR FROZEN SHOULDER (ADHESIVE CAPSULITIS) PATIENTS.

Anaesthesiology

KEYWORDS: Adhesive capsulitis, Frozen shoulder, Intra-articular injection, Supra scapular nerve block.

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ABSTRACT

Objective: The objective of this study was to compare the effect of supra scapular nerve block and intra articular injection to relieve pain and reduce disability in the patients of frozen shoulder.

Materials and Methods: Patients diagnosed as the cases of frozen shoulder in outpatient department of anaesthesia irrespective of their gender were included in the study.52 patients were divided into two groups by randomization, one group received supra scapular nerve block and second group received intra-articular steroid injection. Both groups were advised for supervised physiotherapy after procedures. Patient's pain levels and ranges of movement were assessed over a period of twelve weeks.

Results. The study included total 52 patients to a supra scapular nerve block and intra articular steroid injection, 26 in each group .The mean age of the patients was 53.92 ±8.64 years and the range was 18 to 80 years. There were 21 females and 31 males patients. Post injection assessment of patients was done at one, three, seven and twelve weeks. There was a significant decrease in pain and marked improvement in range of movement with supra scapular nerve block and intra articular injection, but supra scapular nerve block given earlier and fast improvement. Patient's pain levels and ranges of movement were assessed over a twelve week period.

Conclusion: Suprascapular nerve block produced a faster and more complete resolution of pain and restoration of range of movement than intra articular injection.

INTRODUCTION

Adhesive capsulitis (frozen shoulder) has an incidence of 3- 5 % in the general population and upto 20% in those with diabetes. This disorder is one of the most common musculo-skeletal problem seen in orthopaedics and pain physicians.[1,2].

Historically, frozen shoulder has been regarded as a condition for which "recovery is always sure and may be confidently expected "[3]. Earlier several investigators using a variety of treatment methods have reported that a high percentage of affected patients obtain a full range of movement of shoulder as well as complete or nearly complete relief of symptoms [3,4,5,6,7].

The typical patient that develop adhesive capsulitis is a female in her 5th to 7th decade of life [9,10].It can occur sequentially bilaterally in upto 40 – 50 % of patients [13]. Most common co morbid condition is the diabetes mellitus with an incidence of 10 – 36%.

Pathologically the disease is characterized by retraction and thickening of joint capsule and decreased volume of joint fluid. The spontaneous course follows a sequence of 3 phases: pain, decreased range of motion and resolution (freezing, frozen, thawing).

A wide variety of treatments have been investigated including local or oral steroids, supra-scapular nerve block, manipulation under general anaesthesia (MUA), stellate ganglion block, physiotherapy, infiltration brisement and radiotherapy.

Two treatment modalities are included in our study- Intra-articular injection of corticosteroid and Supra-scapular nerve block.

Intra-articular injection of steroid derivatives are the 2nd most common medical intervention for treating painful joint condition (1st is NSAIDs). The rational for injection of an intra-articular steroid derivative is to allow direct delivery of a modest dose of concentrated drug with analgesic and anti-inflammatory properties to the targeted site of pathology. The target in frozen shoulder is the gleno-humeral joint. Supra scapular nerve block is fast emerging as the treatment of choice for chronic shoulder pain, because of simple ,easy , less side effects and cheap method ,and can be performed as a out patient procedure .

In physical therapy, adhesive capsulitis is treated with specific four direction, shoulder stretching and strengthening exercise programs. These procedures will be carried as outdoor procedure and patient can be discharged after 3-4 hours. Best part of it is that patient is having very high degree of apprehension before procedure but after procedure he becomes very much confident about the results.

MATERIALS AND METHODS

The study was done in 52 patients over duration of 1 year and 2 months from October 2015 to November 2016 having frozen shoulder (adhesive capsulitis) at pain clinic, S.M.S. Medical College and Group of Attached Hospitals, Jaipur. With due permission from the institutional ethical committee and review board and written informed patient consent was obtained. Patients with history of chronic shoulder pain with decrease range of motion (active and passive) of shoulder for at least 4 weeks with either sex and of age group 18 to 80 years were included.

Documented restriction of passive glenohumeral and scapulothoracic motion of-

- Abduction < 100 degrees.
- External rotation < 50 % of total range of motion (<40 degrees)
- Internal rotation only to the sacrum or less .

Patients with history of recent trauma, Previous injection in involved shoulder, History of allergy to local anesthetics, Medical conditions like coagulation disorders, local infections, anatomic abnormalities, septic and tubercular arthritis, cases with radiculopathy, avulsion fractures of cervical spine, tendinitis, bursitis, rotator cuff tear, impingement syndrome, avascular necrosis and other cause of degenerative joint disease etc were excluded.

Patient were positioned in sitting position with back straight IN operation theatre –**Supra-scapular nerve block**- A mixture of 40 mg methyl prednisolone acetate and 9.5 ml 0.5%Bupivacaine Hydrochloride) was injected using the technique described by **Dangoisse et al**[14] . A 21G ×1.5" needle will be introduced through the skin 2 cm cephaloid to the midpoint of the spine of the scapula .The needle will advanced parallel to the blade of the scapula until bony contact made in the floor of the supra scapular fossa. This technique will effectively block the articular branches of the supra scapular nerve.

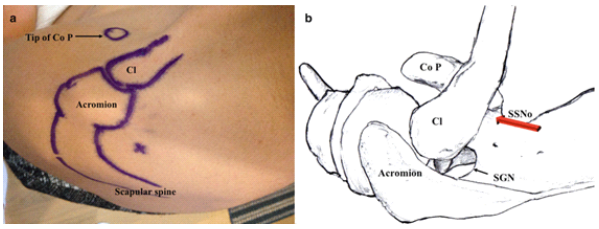

Figure 1. Dangoisse technique.

Posterior shoulder view; the needle is inserted 1 cm above the middle of the spine of scapula to the floor of the supraspinatus fossa.

- **Intraarticular injection**: The solution injected contained 5cc of 2% lidocaine HCL and 1cc (40 mg) methylprednisolone acetate. All patients were injected once. The posterior approach was used to inject glenohumeral joint. The site of entry was same as used for traditional posterior portal for arthroscopy of shoulder. This portal is located 2 to 3 cm inferior and 1 cm medial to the posterolateral tip of the acromion. At this site the attempt was made to pass through the posterior soft spot between the infraspinatus and teres minor muscles. An 18 gauge spinal needle was inserted in this site with tip pointing towards coracoids process anteriorly. The index and middle finger was placed on the coracoid process to direct the tip of needle anteromedially towards the coracoid. When in right direction, the needle faces little resistance on entering the joint. Following each treatment, all patients were given instructions regarding a home exercise programme of self-mobilization, joint-**stretching,** and static rotator cuff **strengthening**. Patients were asked to take only paracetamol for pain relief if its severe.

ASSESSMENT

Pain levels and range of movement were recorded at initial attendance and after one weeks, three weeks, seven weeks, and twelve weeks. To avoid bias, patients graded their pain using SPADI (shoulder pain and disability index). Range of movement was measured using a goniometer in three planes: abduction and external rotation. No attempt was made to isolate gleno-humeral movement, as total shoulder movement in all three planes gave more reproducible results and is a better gauge of function. Data were entered into performa and was analysed using SPSS 12 from values at 3 weeks and 12 weeks follow up

Table I. Comparison Of Two Groups At Initial Assessment

GROUP STUDY	AGE (MEAN)	MALE/ FEMALE RATIO	SPADI SCORE (%)	ABDUCTION (DEGREE)	EXTERNAL ROTATION (DEGREE)
Group A	52.54	1.16	68.15	79.23	45.00
Group B	55.31	1.90	94.46	40	94.46
TOTAL	53.93	1.47	81.31	59.62	81.31

Table II: Pain scores and range of movement in suprascapular nerve block (SNB) and intraarticular groups (IA) at 3rd week.

	SPADI	Abduction	External rotation
Group A	12.69	145	60
Group B	24.62	86.15	50.76
P value	<0.001 (significant)	<0.001 (significant)	<0.001 (significant)

Table III: Pain scores and range of movement in suprascapular nerve block (SNB) and intraarticular groups (IA) at 12th week.

	SPADI	Abduction	External rotation
Group A	0.89	175	80
Group B	9.11	140.77	70.38
P value	<0.001 (significant)	<0.001 (significant)	<0.001 (significant)

RESULTS

The average age of the patients is 53.92 years .About 46 % patients (24 patients) were in between 50—60 years. The oldest patient in our study was 80 years old and the youngest patient was 18 years old . In our study ,there was male predominancy and the male : female ratio was 1.47:1 , probably due to poor health awareness and low female literacy rate in our country .

Frozen shoulder is usually disease of Non dominant limb. In our study, non-dominant limb involvement accounts for 27%.Out of 52 patients, 13 patients (25 %) are diabetic. Group B had higher number of diabetics 9 (69.2% of diabetics).The average duration of pain was 6.5 months, with S.D. of 3.7 .The average duration of restriction of movement in our study was 4.38 months.

The average abduction in our study was 58.62°. It was 79.23° in supra scapular nerve block group and it was less compromised than intra articular steroid injection group (40°).The average external rotation was 37.31°. Patient in supra scapular nerve block group had less compromised external rotation (45°) than intra articular steroid group (29.61°) .

In early follow ups there is significant improvement in abduction in group A, than group B but at the final follow up almost normal range of motion achieved in both groups .The average improvement in abduction in group A was 96.15 and 100.77 in group B at final follow up .

DISCUSSION

Three sequential phases are described in its clinical course [8]. After the painful and stiff phases, the last phase, the resolution phase, is a selflimited.

Membrane of the joint are innervated via axillary, suprascapular, subscapular, and musculocutaneous nerves. The suprascapular nerve, which provides sensory fibers to approximately 70% of the shoulder joint has afferent, efferent, and sympathetic fibers [12]. The efferent fibers innervate the supraspinatus and infraspinatus muscles. The afferent fibers distribute to the articular capsule and ligaments of the glenohumeral and acromioclavicular (AC) joints and to the periosteum and tendons of the scapula. Significant pain relief can be produced if the nerve block can be performed before it gives 8, 12 off to its articular branches.

Both groups achieved almost normal range of ER movement at the final follow up. The average improvement in ER was 37.31 .Both groups achieved normal range of internal rotation movement at 3 weeks follow-up , which continued upto final follow up .Both groups achieved significant improvement in pain and restriction of movement and achieved almost normal day to day activity at final follow up.

Overall good to excellent results in both groups.

Although frozen shoulder is considered as a self-limiting disease in which "recovery is always sure and may be confidently expected " .But previous studies has shown very high percentage of morbidity, which may extend upto years. Our study has large number of patients with adequate duration of follow up.

We found that both modalities supra scapular nerve block and intra-articular steroid are highly effective in improving shoulder pain and disability in patients with frozen shoulder. **We concluded that for patients of mild to moderate affection in which performance of post interventional physical therapy is not a problem, a supra-scapular nerve block with supervised physical therapy is highly effective.** Patients of moderate to severe affection with marked peri-articular affection in whom post intervention physical therapy is supposed to be markedly compromised, Intra articular steroid injections with supervised physical therapy is highly effective .

Various suprascapular nerve block techniques have been described

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by several investigators[11,12,14]. Dangoisse et al described indirect suprascapular nerve blocks, using 14 anatomical landmark. We have demonstrated that suprascapular nerve block is efficacious without the need to image the area, by ultrasound or fluoroscopy during the procedure. Our study shows that this treatment not only reduces pain but also decreases disability and gives clinicians a proven efficacious treatment for patients with frozen shoulder. Whether the efficacy would be further improved with guidance of the needle under direct imaging is unknown. Longer period of pain relief and combination of nerve block with other approaches to pain relief would also be a potentially worthwhile area to study. It is not clear how the nerve block acts to produce a resolution of the symptoms.

As the direct action of Bupivacaine cannot extend beyond a few hours or days there must be an effect on the underlying pathology, which owes in part to the patient's ability to perform an adequate exercise programme. The methylprednisolone included in the injection may have a systemic anti-inflammatory effect, but this should be the same in both groups. A more definitive study could also have a third group of patients treated by nerve block without steroid. Since the nerve block produces a faster resolution, its widespread use could produce a saving of time and further economic benefits if patients are able to return to work sooner.

CONCLUSION

Combination of physical treatments with suprascapular nerve block significantly improve early outcome in chronic shoulder pain, and can be more effective than conventional treatments, offering clear advantages (ease of application, low cost, rare side effects) considering that the top priority of a pain control program is restoring the function of the affected area. Further, it may prove to be a useful treatment for patients who are unfit or unwilling to consider manipulation under anesthesia.

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