

Functional Outcome of Hydrodilatation Versus Intra-Articular Corticosteroid Injection in Patients with Frozen Shoulder.

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Abstract

Background : To compare hydrodilatation with intra-articular injection of corticosteroid in patients with frozen shoulder.

Methods: In this comparative study a total of 80 patients with frozen shoulder were divided into two groups. Patients in group A were treated with hydrodilatation under local anaesthesia . The joint capsule was distended by injecting 40 ml of normal saline. Patient was observed for 30 min and then assisted range of motion and supervised active exercises were performed. Group B patients were treated with intra-articular steroid (triamcinolone acetate) 40 mg along with 1 ml of 1 % w/v of lidocaine . The patient was advised to do shoulder exercises from the next day, three times a day along with oral non-narcotic analgesics. Patients were evaluated by recording pre-procedure pain scoring and range of motion and post-procedure scoring at 4 weeks after the procedure. Effectiveness was taken as improvement in the final score of at least 9 (pain improvement of 5 and ROM score of 4) or more at four weeks follow up.

Results: Majority (60.62%) were male. Group A patients had mean pre procedure score of 9.87 ± 4.44 and post procedure score was 22.8 ± 5.14 , while in group B, pre procedure score was 9.78 ± 4.49 and post procedure score was 21.49 ± 5.56 . Out of 80 patients in group A, the effectiveness was observed in 92.50%, while in group B patients had effectiveness in 73.75%. The chi square test showed the p-value of 0.003, which was quite significant.

Conclusion: Hydrodilatation was found to be effective and convenient outpatient department procedure with better functional outcome, at four weeks follow up, than corticosteroid injection alone.

Key Words: Frozen shoulder, Hydrodilatation, Corticosteroid,

Introduction

Adhesive capsulitis, known as frozen shoulder is a common condition, which involves the glenohumeral joint, caused by inflammation of joint capsule leading

to joint stiffness.¹ In 1934, Codman used the term 'frozen shoulder' for the first time, while Neviasier in 1945, explained the condition as adhesive capsulitis because of the texture and integrity of the joint capsule.²⁻⁴ In general population frozen shoulder has a prevalence of 2-5 % with even higher percentage in diabetics i.e. 11-30%.⁵ Frozen shoulder is commonly associated with other medical conditions such as diabetes mellitus, rheumatoid arthritis, heart disease, hyperthyroidism.⁶ Frozen shoulder is common in women and occurs mostly in 4th to 6th decade of life.^{7,8}

Untreated frozen shoulder courses through three phases. Freezing phase is the first phase, which is painful, phase lasting 2-9 months. In the next phase, which is the frozen phase, there is gradual reduction in pain and the joint becomes stiff with restricted range of motion. Its duration is 4-12 months. While thawing phase is the recovery phase lasting for 6-9 months.^{2,9} Various modalities have been used to treat frozen shoulder, which includes conservative as the main stay of treatment with non-steroidal anti-inflammatory drugs (NSAID), oral glucocorticoids, intra-articular steroid injection, hydrodilatation, physical therapy and manipulation under anesthesia (MUA), but still the results appear to be inconclusive.¹⁰⁻¹⁶ In majority of cases hydrodilatation treatment of frozen shoulder can result in effective outcome.^{2,18}

Patients and Methods

This comparative study was performed in outpatient department of Orthopaedics Unit of Fauji Foundation Hospital Rawalpindi, from September 2014 to December 2017. A total of 80 patients were divided into two groups. Group A patients were treated with hydrodilatation under local anaesthesia, using technique by Shah MA et al.¹⁹ Two ml of plain lidocaine (1% v/v) was injected into the skin and surrounding soft tissue by anterior approach (through deltopectoral groove and then directing medially to the tip of coracoids process, through the

coracobrachialis- biceps origin and subcapsularis). The joint capsule was distended by injecting 40 ml of normal saline. Patient was observed for 30 min and then assisted range of motion and supervised active exercises were performed. Group B patients were treated with intra-articular steroid (triamcinolone acetate 40 mg along with 1 ml of 1 % w/v of lidocaine), followed by oral NSAIDS and muscle relaxants for three days and range of motion physiotherapy for four weeks.^{5,6} The patient was advised to do shoulder exercises from the next day, three times a day along with oral non-narcotic analgesics. Inclusion criteria was patients with clinical diagnosis and normal radiograph for frozen shoulder ,patients having moderate to severe pain in late frozen and early thawing phase (four months to eleven months),patients with limited abduction (less than 121°) and internal rotation which is dorsum of hand to waist or below, with an age group of 20-60 years. Patients with stiff shoulder with other causes, with previous surgical intervention on the same shoulder, with history of recent fracture of humerus, rheumatoid arthritis and osteoporosis and local skin infections and osteomyelitis, detected clinically or radiologically were excluded. Criteria of frozen shoulder were based upon thorough history and proper physical examination regarding pain and range of motion using goniometer to score the patient. The radiographs of all the patients were taken to exclude any other cause of stiffness and shoulder pain. We evaluated the patients by recording pre-procedure pain scoring and range of motion and post-procedure scoring at 4 weeks after the procedure by using constan CR and Murley AHG scoring system as used by Ghauri S.K et al.²⁰ Frozen shoulder pain we used visual analogue scale (VAS) for scoring pain , i.e., No pain = (VAS 0, score 15); Mild pain = (VAS 1-3, score; 10);Moderate pain = (VAS 4-7, score 5);Severe = (VAS 8-10, score 0);Range of motion; maximum score-20.

Lateral abduction score was calculated as :Abduction 0-30°=score-0;Abduction 31-60° =score-2;Abduction 61-90°= score-4;Abduction 91-120° = score-6;Abduction 121°-150° = score-8;Abduction 151°-180°= score-10. Internal rotation score was calculated as:Patient is able to touch lateral thigh with dorsum of hand = score-0;Dorsum of the hand to buttock = score-2;Dorsum of the hand to lumbosacral joint = score-4;Dorsum of the hand to waist = score-6;Dorsum of the hand to 12th dorsal vertebra = score-8;Dorsum of the hand to inter scapula region = score-10. Total score (pain score + range of motion)=

15+20= 35. Effectiveness was taken as improvement in the final score of at least 9 (pain improvement of 5 and ROM score of 4) or more at four weeks follow up.

Results

Out of 160 patients there were 51.25% females and 48.75% males. Group A patients had mean age of 46.21± 8.74 years, while in group B mean age was 45.84 ± 9.16years (Table 01). Group A patients had duration of frozen shoulder for 6.17± 1.91 months, while in group B, duration of frozen shoulder was 7.41± 1.93 (Table 1). In group A the mean pre procedure score was 9.87± 4.44 while the mean post procedure score was 22.8± 5.14, while pre procedure score in group B was 9.78± 4.49 and post procedure score was 21.49± 5.56(Table 2) . In Group A, the effectiveness was observed in 92.50%,while in group B patients had effectiveness in 73.75%. The chi square test showed the p-value of 0.003, which was quite significant (Table 3).

Table 1: Frozen Shoulder- Age, sex and duration

| Characteristic | Group A (Hydrodilatation) | Group B (Corticosteroids) |
|--------------------------------------|-----------------------------------|---------------------------------------|
| Age (years) (Mean ± SD) | 46.58 ± 8.34 | 45.84 ± 9.16 |
| Gender No(%) | Female:52 (65%) Male: 28 (35%) | Female:45(56.25%) Male:35 (43.75%) |
| Duration of frozen shoulder (months) | 6.17 ± 1.91 | 7.41 ± 1.93 |

Table 2. Pre and post procedure scores in group A and group B.

| Group | Pre procedure score | Post procedure score |
|-------|---------------------|----------------------|
| A | 9.87 ± 4.44 | 22.8 ± 5.14 |
| B | 9.78 ± 4.49 | 21.49 ± 5.56 |

Table 3. Effectiveness of procedures in group A and group B

| Group | Effectiveness of procedure |
|-----------------------------|----------------------------|
| A(Hydrodilatation) | 93.67 % |
| B(Corticosteroid Injection) | 77.21 % |

p-value = 0.003

Discussion

Frozen shoulder is a common shoulder joint pathology encountered in orthopedic department. Up to 3% of general population are affected with idiopathic loss of shoulder ROM.²¹ In our

study, women were more commonly affected with frozen shoulder than males (M:F ratio= 1:1.5), which was observed by Richard Dias et al as well.²¹ Literature has shown quite variable age distribution for frozen shoulder patients, affecting from twenty years to eighty-five years.²² In our study, the mean age of patients in our study group was 46.21 ± 8.74 . The literature on frozen shoulder is quite confusing and replete with contradictory information concerning its treatment.²³

According to Sharma RK²⁴ frozen shoulder patients who had no improvement with physical therapy exercises, were treated by manipulation under anesthesia or by injection of corticosteroid and hydraulic distention under local anesthesia and recommended that hydrodilatation gave better results than manipulation.²⁴

Hydrodilatation is believed to exert its positive effects by improving glenohumeral joint motion stretching or joint capsule rupture. Gam et al found marked improvement in range of motion in patients with hydrodilatation and corticosteroid injection than corticosteroid injection only, which was similar to our findings in this study.²⁵ In our study, the patients treated with hydrodilatation had better functional outcome in 74 patients (92.50%) than patients treated with corticosteroid with better functional outcome in only 59 patients (73.75%), with the p-value 0.003 (< 0.005). Buchbinder et al also had a double blind randomized placebo controlled trial, and supported the use of hydrodilatation of frozen shoulder.²⁶ We did not find any side effects in our study except mild pain in hydrodilatation procedure and one female in group A patients had transient hypotension (vasovagal) during hydrodilatation.

Conclusion

Hydrodilatation was found to be effective, convenient outpatient department procedure with better outcome than corticosteroid injection alone.

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