

(RESEARCH ARTICLE)



Evaluation of the role of intra-articular corticosteroids on improvement of range of motion in adhesive capsulitis

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Abstract

Adhesive capsulitis is often described by restricted glenohumeral elevation and external rotation, together with unremarkable radiographic findings, are also observed. The condition is commonly reported burden of middle age between 40 and 65 and is rare in children age group and in manual workers with it being slightly more common in women (3.38 women and 2.36 men per thousand person years). Nowadays, there are many intervention options that are accessible for PAS, manipulation under anaesthesia which the shoulder is freed by rotation while the patient is under short general anaesthesia. This can be undertaken as a day procedure, exercise therapy, electrotherapy, hydrotherapy etc as well as pharmacotherapy and surgery. The present study was done to compare sub-acromial and rotator interval approach of corticosteroid injection in patients with adhesive capsulitis of the shoulder joint and evaluate the improvement in the ROM in such patients.

Keywords: frozen Shoulder; Painful Shoulder Movements; Chronic Shoulder Pain; Intra-Articular Pain Therapy

1. Introduction

Neviaser in 1945 who given the term 'adhesive capsulitis' for painful Stiffening of the shoulder [1-4]. Adhesive capsulitis (AC), also known as frozen Shoulder, is a common and painful musculoskeletal disorder. Frozen shoulder, a term coined by Codman in 1934, is an orthopaedic condition that is commonly encountered general orthopaedic practice. Codman used this term to describe a condition with symptoms of shoulder pain and discomfort that is slow in onset and located around the deltoid insertion. Patients generally complaint of an inability to sleep on the affected side. Restricted glenohumeral elevation and external rotation, together with unremarkable radiographic findings, are also observed [6]. The condition is commonly reported burden of middle age between 40 and 65 and is rare in children age group and in manual workers with it being slightly more common in women (3.38 women and 2.36 men per thousand person years) [7].

PAS is believed to have an incidence of 3% to 5% in the general population and up to 20% in those with diabetes [8], patients with PAS have a higher risk of having certain form of pre diabetic condition with an abnormal fasting glucose or impaired glucose tolerance test [9]. Nowadays, there are many intervention options are accessible for PAS, manipulation under anaesthesia which the shoulder is freed by rotation while the patient is under short general anaesthesia. This can be undertaken as a day procedure [15], exercise therapy, electrotherapy, hydrotherapy [16], bupivacaine suprascapular nerve blocks using bupivacaine and methylprednisolone acetate in chronic shoulder pain [17], which are anti-inflammatories, intra-articular corticosteroid injections to reduce the inflammation and provide the pain relief [18], arthroscopic capsular release and repair a surgical procedure conducted under anaesthesia which the contracted tissue is released [19]. Most of Patients may also choose complimentary therapies like physiotherapy

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[20], arthroscopic capsular distention (also called hydrodilatation) which involves controlled dilatation of the joint capsule with sterile water under local anaesthesia [21].

There are very few studies performed comparing the different routes of corticosteroid administration in case of adhesive capsulitis. Hence, the present study was done to compare sub-acromial and rotator interval approach of corticosteroid injection in patients with adhesive capsulitis of the shoulder joint and evaluate the improvement in the ROM in such patients.

2. Material and methods

This was a prospective study conducted in the Department of Orthopaedics in Justice K.S. Hegde Charitable hospital, Mangalore, India between January 2020- June 2021. The study included a total of 30 study participants, 15 in rotator interval and 15 in subacromial group respectively. The study included patients with symptoms lasting for atleast 1 month, and didn't respond to treatment, aged between 25-80 years. Patient with previous injections to the shoulder, osteoarthritis, fractures involving shoulder joint and rotator cuff tear were excluded from the study.

The ROM- abduction, forward flexion and external rotation, were evaluated in these two groups prior to corticosteroid injection and on 3,6, and 12 weeks follow-up.

The data collected was recorded in a semistructured pro forma, and analyzed using SPSS software v21.

3. Results

The patients in the sub-acromial group were younger, belonging to 41-50 years, while those in the rotator interval group were in the age group of 51-60 years.

The rotator interval group patients were predominantly males (80%), while those in the sub-acromial group were females (53.3%). This difference was statistically significant (0.003*).

3.1. Range of motion- abduction

Table 1 Improvement in abduction with intra-articular corticosteroids

Range of movement-abduction	Pre-injection	Post-injection-3 weeks	Post-injection-6 weeks	Post-injection 12weeks
<90	5	3	2	0
90-110	9	6	3	1
110-120	1	4	1	1
121-140	0	1	6	9
>140	0	1	3	4

The mean abduction prior to the corticosteroid injection in the rotator interval group is 108 +/- 39.68 degrees, while it is 99.33 +/- 33.05 degrees in the sub-acromial group. Mean abduction in the rotator interval group at the 3 week, 6 week and 12 week follow up was 136.67, 144.47 and 144.67 degrees respectively. In the subacromial group on follow-up, the range of abduction was found to be 136.67, 131 and 134 degrees respectively. In each of the groups individually, there was a statistically significant improvement in the range of abduction after corticosteroid injection. However, there was no statistically significant difference between the rotator interval and sub-acromial group.

3.2. Range of motion for forward flexion

The mean forward flexion of the shoulder joint in the rotator interval group in the pre-injection group is 117.67 +/- 40.26 degrees, while that in sub-acromial group is 115 +/- 31.45 degrees. There was a statistically significant difference within the group at the 3,6 and 12 week follow-up. However, there was no significant improvement in the forward flexion between the two groups.

3.3. Range of motion for external rotation

The mean external rotation of shoulder joint pre-injection was 53.67 degrees in the rotator interval group, and 48 degrees in the sub-acromia group. There was a statistically significant improvement in the sub-acromial group on follow up at 3,6 and 12 weeks, however the same was not observed in the rotator interval group. However, this difference between the groups was not statistically significant.

4. Discussion

Adhesive capsulitis is a distressing condition plagued by most diabetics, disrupting their day-to-day activities. It is noted in several studies that corticosteroid injections into the joint capsule, with or without ultrasound guidance, can help in reducing the pain and stiffness associated with it. However, little is known about the ideal method of injection of the same.

In this study, mean age of the study participants was 55.07 years in the rotator interval group, and

54.67 years in the sub-acromial group. In a study by Oh JH et al (9), the mean age was higher in the sub-acromial group (n=34, 58.3 years), which is contradictory to the findings of our study.

In this study, there were more males than females. However, in many studies, it has been found the females are more affected by adhesive capsulitis. For eg, Goyal et al(10) showed that 72/105 of the study participants were females. This contradicts the findings of our study. This could be due to the fact that men are more likely to approach the doctor for pain in the shoulder, rather than a woman.

In this study, there was no significant improvement in ROM. However, a study done by Prestgaard and team (11), they found a significant improvement within each group, but there was no difference between the two groups, which was similar to the findings of the present study. Similar findings were noted by Oh JH et al (9).

5. Conclusion

There is no difference in the range of movement between rotator cuff and sub-acromial injection in patients with adhesive capsulitis. However, a larger sample size is necessary to confirm the same.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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