

## Original Article

## COMPARISON OF THE MEAN DECREASE OF PAIN SCORE (ACCORDING TO ULCA SHOULDER RATING SCALE) WITH INTRA ARTICULAR NSAID INJECTION VERSUS STEROID INJECTION FOR THE MANAGEMENT OF ADHESIVE CAPSULITIS

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**Objective:** Adhesive capsulitis is a common condition in which the shoulder capsule swells and stiffens, restricting its mobility. It is a common cause of shoulder pain and disability, estimated to affect 25% of the general population. The objective of the study was to compare the mean decrease of pain scores (according to ULCA shoulder rating scale) with intra-articular non-steroidal anti-inflammatory (NSAID) injection versus steroid injection for the management of adhesive capsulitis of the shoulder.

**Material and Methods:** A Randomized controlled trial was carried out in Department of Orthopedic Surgery at Services Hospital Lahore from September 2012 to March 2013. A total of 150 patients with adhesive capsulitis of the shoulder were included in the study and were assigned into two groups using random number table. Group A patients received intra-articular NSAID (Ketorolac) and Group B patients were treated with intra-articular steroid (Triamcinolone) injection for the treatment of adhesive capsulitis. The pain scores were recorded before and four weeks after the intra-articular injections using ULCA shoulder rating scale.

**Results:** The age distribution of the 150 patients shows that majority of the patients i.e. 37.33% (n=28) in Group A and 33.33% (n=25) in Group B were between 51-60 years, mean and SD was calculated as 53.55+5.11 and 55.21+5.76 years respectively. In Group-A 45.33% (n=34) and in Group-B 48% (n=36) were males whereas 54.67% (n=41) and 52% (n=39) were females. The pre-treatment pain score in both groups was recorded as 4.43+1.76 in Group A and 5.92+1.31 in Group B. The post-treatment pain score was 7.95+0.32 in Group A and 6.76+0.63 in Group B ( $p=0.01$ ), showing significant difference in both groups.

**Conclusion:** The intra-articular NSAIDs injection is a more effective treatment option compared to intra-articular steroid injection for the management of adhesive capsulitis of the shoulder.

**Key words:** Adhesive capsulitis, intra-articular injection, NSAIDs, ULCA Pain score.

### Introduction

The shoulder is a unique joint with an extraordinary range of motion allowing us to interact freely with our environment.<sup>1</sup> Any reduction in shoulder mobility causes functional disabilities for the patients. Frozen shoulder is defined as a clinical syndrome characterized by painful restriction of active and passive movements of shoulder joint.<sup>2</sup> It is also known as Adhesive Capsulitis but frozen shoulder is the term which is most commonly known and used.<sup>3</sup> Although the pathogenesis progresses through fibrosis and culminates in joint contracture, it is generally recognized as a self-limiting process with an unknown etiology.<sup>4</sup>

The natural history is not completely understood and recent literature has shown that long term disability may occur following resolution of the disease.<sup>6</sup> Further, it is not entirely clear how much a specific treatment improves long-term outcomes.

Exercises, physiotherapy programs, ultrasound therapy, laser therapy, trans-cutaneous electrical stimulation, iontophoresis, oral non-steroidal anti-inflammatory drugs and intra-articular injections to the glenohumeral joint, or their combinations are used to treat adhesive capsulitis.<sup>7</sup> NSAIDs have potent anti-inflammatory properties and several have been used to treat tendonitis of the rotator cuff.<sup>8</sup> A study compared the efficacy of a single subacromial NSAID injection with a single injection of corticosteroid in patients with subacromial impingement and recorded that the mean improvement in Constant-Murley score at six weeks was greater in steroid group versus NSAID group, creating discrepancy regarding the effectiveness of NSAIDs.<sup>9</sup> The advantage of the current study was that It was carried out on a greater number of patients as compared to previous studies.<sup>8,9</sup> This study was conducted to evaluate the effectiveness of intra-articular NSAID vs steroid injection of the

shoulder in treatment of adhesive capsulitis of the shoulder.

### Material and Methods

This Randomized controlled trial was carried out in Department of Orthopedic Surgery at Services Hospital Lahore from September 2012 to March 2013. Non-probability consecutive sampling was done. Sample size of 150 cases, 75 cases in each group was calculated with 95% confidence level and 80% power of test. Patients of both genders aged between 18 to 70 years with history of adhesive capsulitis for last six months were included in the study. Patients having uncontrolled diabetes mellitus, contraindications of intra-articular injections (i.e. history of drug reaction, renal failure, local skin infection), previous history of treatment with any intra-articular shoulder injections or shoulder surgery were excluded. One hundred and fifty patients fulfilling the inclusion criteria were enrolled after obtaining the informed consent. Approval from the hospital ethical committee was obtained for this study. Randomization using a random number table was done by the researcher. Patients were divided in two equal groups Group A and Group B. Patients in Group A received 6ml of 1% lidocaine with epinephrine and ketorolac 60 mg injection whereas Group B patients received 6ml of 1% lidocaine with epinephrine and triamcinolone 40mg injection. Standard posterior approach was used to administer intra-articular injections in all the patients. The demographic information was recorded on a proforma, pain score was assessed and recorded before administration of the injections and 4 weeks following the injection according to ULCA shoulder rating scale<sup>10</sup>.

### Statistical Analysis

The collected data was entered in computer software SPSS software (version 13.0). Mean + standard deviation was calculated for age and pre-and post pain scores. The frequency and percentages were calculated for gender, independent t-test sample was applied on quantitative variable i.e. ULCA shoulder rating score, to compare the mean decrease of pain score in both groups. Stratification of age and gender was also done. P value  $\leq 0.05$  was considered as significant.

### Results

A total of 150 cases (75 in each group) fulfilling the inclusion criteria were enrolled to compare the

mean decrease of pain (according to ULCA shoulder rating scale) with intra-articular NSAID injection versus steroid injection for the management of adhesive capsulitis. Age distribution of the patients was done, which shows 2.67% (n=2) in Group A and 1.33% (n=1) in Group B were between 18-30 years, 8% (n=6) in Group A and 6.68% (n=5) in Group B were between 31-40 years, 24% (n=18) in Group-A and 29.33% (n=22) in Group-B were between 41-50 years of age, 37.33% (n=28) in Group-A and 33.33% (n=25) in Group-B were between 51-60 years while 28% (n=21) in Group-A and 29.33% (n=22) in Group-B were between 61-70 years of age, mean and SD was calculated as 53.55+5.11 and 55.21+5.76 years respectively. **(Table-1)** Gender distribution of the patients was done which shows 45.33% (n=34) in Group A and 48% (n=36) in Group B were male and 54.67% (n=41) in Group A and 52% (n=39) in Group B were females. **(Table-2)** Pre-treatment pain score was recorded 4.43+1.76 in Group-A and 5.92+1.31 in Group-B. **(Table-3)**. Post-treatment pain score was also recorded, which reveals 7.95+0.32 in Group A and 6.76+0.63 in Group B. T-test was applied; p value was recorded as 0.01. This reveals statistically significant pain improvement in NSAID group as compared with the steroid group **(Table-4)**. Stratification of post-treatment pain score in both groups for gender was done which shows 7.32+0.65 in Group A in and 6.54+0.83 in Group B in male participants while 7.43+0.51 in Group-A and 6.22+0.41 in Group-B were females. **(Table-5)**.

**Table-1:** Age distribution of the patients(n=150).

Age (in years)	Group-A (n=75)		Group-B (n=75)	
	No of Patients	%	No of Patients	%
18-30	2	2.67	1	1.33
31-40	6	8	5	6.68
41-50	18	24	22	29.33
51-60	28	37.33	25	33.33
61-70	21	28	22	29.33
Total	75	100	75	100

**Table-2:** Age distribution of the patients(n=150).

Gender	Group-A (n=75)		Group-B (n=75)	
	No of Patients	%	No of Patients	%
Male	34	45.33	36	48
Female	41	54.67	39	52
Total	75	24	76	100

**Table-3:** Pre-treatment pain score (according to ULCA shoulder rating scale) in both groups(n=150)

Pain Score	Group-A (n=75)	Group-B (n=75)
	4.43±1.76	5.92±1.31

**Table-4:** comparison of post-treatment pain score (according to ulc shoulder rating scale) in both groups(n=150).

Pain Score	Group-A (n=75)	Group-B (n=75)	P value
	7.95±0.32	6.76±0.63	0.01

**Table-5:** Stratification of post-treatment pain score in both groups with gender (n=150).

Gender	Group-A (n=75)	Group-B (n=75)
Male	7.32±0.65	6.54±0.83
Female	7.43±0.51	6.22±0.41

## Discussion

Adhesive capsulitis is characterized by a gradual and painful loss of both active and passive range of motion in all planes of glenohumeral joint, especially external rotation, resulting from progressive fibrosis and contracture of the glenohumeral joint capsule. A wide variety of interventions are available for restoring movement and decreasing pain in adhesive capsulitis of shoulder. Different options include rest, oral NSAIDs, physiotherapy, extracorporeal shock wave therapy, intra-articular NSAIDs injection, intra-articular corticosteroids injection, hydro-dilatation, manipulation under anesthesia and arthroscopic capsular release<sup>11</sup>.

NSAIDs are potent anti-inflammatory and analgesic drug commonly used for acute and chronic painful conditions. Studies have been done recently to determine the effectiveness of intra-articular use of NSAIDs as an alternative to steroid injections<sup>8,9</sup>. We planned this study to compare the mean decrease of pain scores with intra-articular NSAIDs injection versus steroid injection for the management of adhesive capsulitis, as no such study was conducted

before. Our study reveals that post treatment scores were  $7.95 \pm 0.32$  in Group A (NSAIDs) and  $6.76 \pm 0.63$  in Group B (Corticosteroids), with p value of 0.01. This reveals statistically significant pain improvement in NSAID group as compared with the steroid group.

Nancy A. Melville<sup>8</sup> reported mean improvement (according to ULCA shoulder rating scale) in the score 7.15 for the NSAID group compared with 2.13 in the steroid group, our findings are in agreement with these findings. Additionally, the group receiving NSAID injections for shoulder pain had an increase in strength on forward flexion, whereas the steroid group showed a marginal decrease in strength. Patients in the NSAID group were also more satisfied with their treatment than those receiving steroid injection. It is also observed that, whilst both groups had initial improvements. But we need a longer follow up study to prove the long term significant pain reducing effects of intra-articular NSAID injection.

Using NSAID injection is preferable to corticosteroid injection as they do not have the same side-effects of tissue loss, tendon rupture and cartilage damage and may be given more frequently. There are some potential disadvantages to NSAIDs injection for shoulder pain in patients with kidney dysfunction, bleeding and gastric ulcers. These are not suitable candidates for this treatment as it may exacerbate their medical conditions.

## Conclusion

The mean decrease of pain (according to ULCA shoulder rating scale) with intra articular NSAID injection was significantly greater than steroid injection for the management of adhesive capsulitis of the shoulder. We recommend that the intra-articular NSAID injection of the shoulder is more effective and reliable modality for the treatment of adhesive capsulitis.

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