

Effectiveness of Intra-articular Corticosteroid Injection in the Treatment of Idiopathic Frozen Shoulder

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ABSTRACT

- Objective** To determine the efficacy of intra-articular corticosteroids in the treatment of idiopathic frozen shoulder.
- Study design** Quasi experimental.
- Place & Duration of study** Department of Orthopedics Surgery Hayatabad Medical Complex Peshawar, from February 2010 to October 2010.
- Methodology** In this study, 113 cases of idiopathic frozen shoulder were selected by non-probability consecutive sampling technique at the outpatient department. Patients received a single intra-articular injection of corticosteroid (methylprednisolone) followed by physiotherapy for four weeks. Shoulder pain and disability index (SPADI) was used as main outcome measure of pain relief and disability.
- Results** Mean age of the patients was 49 ±9.3 year. Using SPADI, the mean baseline pain and disability scores were 81±7.2 and 79.5±7.6 respectively which significantly improved to 14.5±7.4 and 25.6±18.2 at 4th week of intra-articular injection in the affected glenohumeral joint with p value of 0.000 and 0.040 respectively.
- Conclusion** Intra-articular steroid injection is an effective and reliable modality of treatment for relieving pain and decreasing disability in idiopathic frozen shoulder.
- Key words** Frozen shoulder, Intra-articular injection, Shoulder pain, Disability index.

INTRODUCTION:

Frozen shoulder is a clinical syndrome characterized by painful restriction of both active and passive movements.¹ It is often considered to be self-limiting condition but the available evidence does not support this.² The causes are largely unknown.³ Variable nomenclature, inconsistent reporting of disease stage and a multitude of different treatments have created a confusing and contradictory body of literature about this condition.⁴

A variety of therapeutic interventions are available for restoring motion and diminishing pain in patients

with frozen shoulder.⁵ This include rest, non-steroidal anti-inflammatory drugs, active and passive mobilization, physiotherapy, oral and intra-articular corticosteroids, hydro-dilatation, manipulation under anesthesia, arthroscopic capsular release and suprascapular nerve block.⁵⁻¹¹ Its treatment is difficult since none of the currently used therapies are proven to be effective. The intra-articular corticosteroid injection alone is commonly used to treat adhesive capsulitis.^{8,9} There is currently limited evidence to either support or refute its use.¹²

This study has been conducted to evaluate the effectiveness of intra-articular corticosteroid (methylprednisolone) injection in the treatment of idiopathic frozen shoulder in mid-term follow-up.

METHODOLOGY:

This Quasi experimental study was conducted in the outpatient department of Orthopedics Surgery,

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Hayatabad Medical Complex, Peshawar from February 2010 to October 2010. Improvement in shoulder pain and disability using shoulder pain and disability index were the main outcome measures. Patients were selected for study using non-probability consecutive sampling technique. Patients with idiopathic frozen shoulder with age more than 18 year of both genders were included. Patients with idiopathic frozen shoulder with previous history of local intra-articular injection, those with secondary frozen shoulder, and who were lost to follow at 4 weeks were excluded. Ethical approval was taken from the institutional review and ethics board.

Patients were diagnosed as cases of idiopathic frozen shoulder clinically having shoulder pain of at least one month duration with accompanying severe limitation of active and passive glenohumeral movements, in all range of motions especially internal rotation, with normal X-rays of the affected glenohumeral joint. On registering the patient data (shoulder pain and disability) was recorded on shoulder pain and disability index (table I).¹³

All patients received intra-articular corticosteroid injection. This was given as a mixture of 2ml (80mg) methylprednisolone and 1ml lignocaine 2% (for local pain relief due to intra-articular injection), in a single syringe. Patients were sent home after completion of the procedure and advised range of movement exercises. Follow up after four weeks was advised and SPADI score was recorded for variables.

The data were analyzed in SPSS 10. Frequency and percentages were calculated for categorical variables like gender and shoulder evaluated. Mean and standard deviation were calculated for numeric variables like score on Visual Analog Scale of pain and disability both on baseline and at four weeks interval. Student t test was applied to find whether the difference in intensity of pain and disability before and after treatment with intra-articular corticosteroid injection was statistically significant. p value <0.05 was considered as level of significance.

RESULTS:

A total of 126 patients were enrolled. Thirteen patients were lost to follow up at 4 weeks time and excluded. Final analysis is made on 113 patients. The mean age of the patients included in this study was 49 ±9.3 year. There were 62 (55%) males and 51 (45%) females. In 47 (42%) patients the right side (dominant) shoulder was affected while in 66 (58%) patients the left side (non dominant) shoulder was involved.

Using SPADI the baseline subscale pain was 81±7.2

which improved to 14.5 ±7.4 at 4th week of intra-articular corticosteroid injection in the affected glenohumeral joint. When compared statistically a significant p value of 0.000 was obtained. The mean baseline SPADI subscale disability score was 79.5 ±7.6 which improved to 25.6±18.2 at 4th week of intra-articular injection in the affected glenohumeral joint (p 0.040). The results are given in table II.

DISCUSSION:

Frozen shoulder or adhesive capsulitis is a common problem in general practice presenting as pain that may be severe with progressive loss of movement and function. Painful stiffness of the shoulder is an ill-defined clinical entity that is difficult to assess and treat.¹² Effectiveness of steroid injections in short-term follow up is well established but its effectiveness in mid-term and long-term follow up is yet to be established. In this study we established a marked clinical improvement in the population studied.

The baseline characteristics in our study were similar to those reported in the literature.^{8,12,14} No racial predilection has been reported in the literature, however women are thought to be affected more than men.¹² Idiopathic frozen shoulder might affect both shoulders in up to 16% of patients.¹⁴ It is more common in left shoulder (non-dominant-66%) than on right shoulder (dominant-47%).¹² Although the literature suggests that this condition is more common in females but in our study and study conducted by Ahmad et al the frequency was more in males.⁸

Intra-articular corticosteroids have the additive effect of providing rapid pain relief, mainly in the first weeks of the exercise treatment period. In patients with adhesive capsulitis who have pain symptom predominantly, intra-articular corticosteroid therapy could be advised concomitantly with exercise.⁹ In a randomized controlled trial of intra-articular corticosteroids versus placebo with or without physiotherapy, all participants were given an identical home exercise program. Outcome measures were assessed at 6 weeks.¹⁵ It was found that corticosteroids significantly improved pain and disability as compared to placebo.

Carette et al compared four treatments: intra-articular corticosteroid injection (under fluoroscopic control) plus physiotherapy, corticosteroid injection alone, saline injection plus physiotherapy, and saline injection alone. The authors concluded that intra articular corticosteroids (with or without

Table I: Shoulder Pain and Disability Index

Pain scale How severe is pain? 0: no pain and 10: worse pain imaginable										
At its worse?	1	2	3	4	5	6	7	8	9	10
When lying on the involved side?	1	2	3	4	5	6	7	8	9	10
Reaching for something on high shelf?	1	2	3	4	5	6	7	8	9	10
Touching the back of your neck?	1	2	3	4	5	6	7	8	9	10
Pushing with the involved arm?	1	2	3	4	5	6	7	8	9	10
Total pain score: _____/50x100= _____%										
Disability Scale How much difficulty do you have? 0: no difficulty and 10: so difficult it requires help.										
Washing your hair?	1	2	3	4	5	6	7	8	9	10
Washing your back?	1	2	3	4	5	6	7	8	9	10
Putting on an undershirt or jumper?	1	2	3	4	5	6	7	8	9	10
Putting on a shirt that buttons down the front?	1	2	3	4	5	6	7	8	9	10
Putting on your pants?	1	2	3	4	5	6	7	8	9	10
Placing an object on high shelf?	1	2	3	4	5	6	7	8	9	10
Carrying a heavy object of 10 pounds (4.5kg)?	1	2	3	4	5	6	7	8	9	10
Removing something from your back pocket?	1	2	3	4	5	6	7	8	9	10
Total disability score: _____/80x100= _____%										

Table II: The Mean SPADI and Pain Scores with p value.

Outcome measure (maximum score)	Mean Standard Deviation	p-value
Baseline SPADI – total (100)	80.3±9.8	0.000
SPADI – total (100) after 4 weeks	19.9±5.3	
Baseline SPADI – pain (100)	81±7.2	0.000
SPADI – pain (100) after 4 weeks	14.5 ±7.4	
Baseline SPADI – disability (100)	79.5 ±7.6	0.040
SPADI – disability (100) after 4 weeks	25.6±18.2	

physiotherapy) significantly improved pain and disability at 6 weeks compared to saline injection plus physiotherapy or saline injection alone.¹⁶

In systematic reviews of five Cochrane and 18 randomized controlled trials Favejee et al studied the effectiveness of oral medication, injection therapy, physiotherapy, acupuncture, arthrographic distension and suprascapular nerve block (SSNB).⁵ They found strong evidence for the effectiveness of steroid injections and laser therapy in short-term and moderate evidence for steroid injections in mid-

term follow-up. For other commonly used interventions no or only limited evidence of effectiveness was found. High quality trials are needed to document long-term results.

Potential limitations of our study are small sample size, no control group and technique of intra-articular corticosteroid injection that was given without fluoroscopic guidance or ultrasound facilitation. Therefore it is not possible to know with certainty that all injections were indeed, intra-articular. In our trial patients had idiopathic frozen shoulder with

pain and restricted movements either at late stage 1 or stage 2 disease. But outcome measures were not assessed separately for each stage. We hope that future research will focus on these weaknesses.

CONCLUSIONS

Intra-articular corticosteroid injection is effective in the treatment of idiopathic frozen shoulder. It allows patient to regain range of movements, decreases disability and relieves pain till 4th week.

REFERENCES:

1. Richards DP, Glogau AI, Schwarts M, Harn J. Relation between adhesive capsulitis and acromial morphology. *Arthroscopy* 2004;20:614-9.
2. Shaffer B, Tibone JE, Kerlan RK. Frozen shoulder: A long term follow up. *J Bone Joint Surg* 1992;74(A):738-46.
3. Lubiecki M, Carr A. Frozen shoulder: past, present, and future. *J Orthop Surg* 2007; 15:1-3.
4. Neviasser AS, Hannafin JA. Adhesive capsulitis: a review of current treatment. *Am J Sports Med* 2010; 38:2346-56.
5. Favejee MM, Huisstede BM, Koes BW. Frozen shoulder: the effectiveness of conservative and surgical interventions-systematic review. *Br J Sports Med* 2011;45:49-56.
6. Saqlain HA, Zubari A, Taufiq I. Functional outcome of frozen shoulder after manipulation under anesthesia. *J Pak Med Assoc* 2007;57:181-5.
7. Lorbach O, Anagnostakos K, Scherf C, Seil R, Kohn D, Pape D. Nonoperative management of adhesive capsulitis of the shoulder: oral cortisone application versus intra-articular cortisone injections. *J Shoulder Elbow Surg* 2010;19:172-9.
8. Ahmad I, Askar Z, Durrani Z, Idrees M, Ayaz M, Hakim A. Intraarticular injection of methylprednisolone for idiopathic frozen shoulder. *Pak J Med Sci* 2009;17:16-8.
9. Bal A, Eksioglu E, Gulec B, Aydog E, Gurcay E, Cakci A. Effectiveness of corticosteroid injection in adhesive capsulitis. *Clin Rehabil* 2008; 22:503-12.
10. Buchbinder R, Green S, Forbes A, Hall S, Lawler G. Arthrographic joint distension with saline and steroid improves function and reduces pain in patients with painful stiff shoulder; results of a randomized, double blind, placebo controlled trial. *Ann Rheum Dis* 2004;63:302-9.
11. Ozkan K, Ozcekic AN, Sarar S, Cefit H, Ozkan FU, Unay K. Suprascapular nerve block for treatment of frozen shoulder. *Saudi J Anaesth* 2012;6:52-5.
12. Tasto JP, Elias DW. Adhesive capsulitis. *Sports Med Arthrosc* 2007;15:216-21.
13. Williams JW, Holleman DR, Simel DL. Measuring shoulder function with the Shoulder Pain and Disability Index. *J Rheumatol* 1995;22:727-32.
14. Dias R, Cutts S, Massoud S. Frozen shoulder: clinical review. *Br Med J* 2005;331:1453-6.
15. Ryans I, Montgomery A, Galway R. A randomized controlled trial of intra-articular triamcinolone and/or physiotherapy in shoulder capsulitis. *Rheumatology* 2005;44:529-35.
16. Carette S, Moffet H, Tardiff J. Intraarticular corticosteroids, supervised physiotherapy, or a combination of the two in the treatment of adhesive capsulitis of the shoulder. *Arthritis Rheum* 2003;48:829-38.