

FROZEN SHOULDER TREATMENT: TRIAMCENALONE OR METHYLPREDNISOLONE INJECTIONSanjib Goswami¹, Prabin Ch. Gogoi²**HOW TO CITE THIS ARTICLE:**

Sanjib Goswami, Prabin Ch. Gogoi. "Frozen Shoulder Treatment: Triamcinalone or Methylprednisolone Injection". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 84, October 19; Page: 14710-14715, DOI: 10.14260/jemds/2015/2091

ABSTRACT: OBJECTIVE: To compare the effectiveness of Triamcinolone acetonide [40mg] and Methylprednisolone acetate [40mg] in 210 patients attending the Outpatient Department of Orthopedics of FAAMCH Barpeta with primary and secondary frozen shoulder. **METHODS:** A total number of 210 patients with frozen shoulder who attended the Outpatient clinic of Orthopedics at FAAMCH from Jan 2013 to Jan 2015 were enrolled in our study. The diagnosis of frozen shoulder was made using the guidelines for shoulder complain issued by the Dutch College of General Practitioners. Intra-articular injections of Triamcinolone acetonide [40mg] was used in 110 patients [Male-50, female-60] and 40mg Methylprednisolone was given to 100 patients [Male-35, female 65]. Injection was repeated every 3 weeks [Not more than 3 injections] by the posterior route. **RESULTS:** Triamcinolone acetonide was found to be more effective in diabetic patients with frozen shoulder in comparison to Methylprednisolone acetate. Triamcinolone acetonide was found to be more effective in those patients presenting with severe grades of frozen shoulder and also these patients required lesser number of injections compared to Methylprednisolone acetate. However both Triamcinolone acetonide and Methylprednisolone were equally effective in primary frozen shoulder. **CONCLUSION:** We conclude that Triamcinolone acetonide and Methylprednisolone acetate are effective in the treatment of painful stiff shoulder; however injection Triamcinolone acetonide is a superior alternative in the treatment of diabetics with frozen shoulder & resistant cases, with less number of injections.

KEYWORDS: Frozen Shoulder, Intraarticular Injection, Triamcinalone, Methylprednisolone.

INTRODUCTION: Frozen shoulder is a common complaint among patients attending the outpatient services in the Orthopedics department. The annual incidence in general practice vary from 6.6 to 25 cases per 1000 cases.^{1,2,3} It tends to occur in patients more than 40 years of age & more in women. 15% patients develop bilateral disease. Complete recovery is however not infrequent & 7-15% of patients permanently lose their range of abduction motion. The term frozen shoulder was first introduced by Codman in 1934.¹ It is characterized by retraction of the anterior portion of the glenohumeral joint capsule leading to pain & restriction of motion.

It is frequently treated with physical therapy, NSAIDS, Intra-articular steroid injections & surgical manipulation under general anesthesia. However, these therapies provide limited benefits and most patients slowly improve in 12- 24 months.⁴ without any treatment.

The effectiveness of corticosteroid alone in the treatment of frozen shoulder remains questionable.^{5,6,7} Hazleman.⁸ found that the success of treatment depends on the duration of symptoms. Patients who received the injections earlier in the course of the disease recovered more quickly. Intra-articular steroid injections are not indicated in the adhesive phase as the inflammatory stage of the disease has passed.⁹

ORIGINAL ARTICLE

In stage II & III, the efficacy of intra-articular Triamcinolone acetonide [40mg] was 5-8 times higher than oral Triamcinolone tablet at the first week of treatment.¹⁰ At 6 weeks, steroid injection is more effective than Physiotherapy alone.¹¹ Moreover, single intra-articular steroid injection in combination with Physiotherapy is effective in reducing pain & disability.¹²

This study is aimed to compare the effectiveness of intra-articular injections of two corticosteroids: injection Triamcinolone acetonide [40mg] & injection Methylprednisolone acetate [40mg] in our patients with primary & secondary [Post traumatic or type 2 DM] frozen shoulder.

MATERIALS AND METHODS: This is a prospective study of those patients who attended the Orthopaedics OPD at Fakhruddin Ali Ahmed Medical College Barpeta from January 2013 to January 2015 with frozen shoulder. The inclusion criteria were patients with painful restriction of glenohumeral mobility, more than 30 years of age. Patients were excluded if they had bilateral disease, if they had treatment with corticosteroid injection or Physiotherapy during the preceding 6 months, if they had any history of allergy, if they had surgery, dislocations or fractures in shoulder area, if they had Insulin dependent Diabetes mellitus, Rheumatoid arthritis or neurological disorders.

The diagnosis of frozen shoulder was made using the diagnostic guidelines of shoulder complaint issued by the Dutch College of General Practitioners.^{2,13} that is, passive glenohumeral activity must be painful & limited, external rotation must be relatively more restricted than abduction & medial rotation, and there must be no signs of rotator cuff lesion or rupture or subacromial bursitis & that the shoulder pain was not caused by any other conditions. The following investigations were performed- chest & shoulder X rays, complete blood picture, erythrocyte sedimentation rate, fasting blood sugar and CRP.

Intra-articular injections of 40mg Triamcinolone acetonide [Males 50 & females 60] or 40mg Methylprednisolone acetate [Males 35 & females 65] were given at every 3 weeks interval by the authors using posterior route.¹⁴ No more than 3 injections were given & all patients were assessed by 8 weeks.

The patients were allowed to continue taking drugs for pain if the pain was severe. One muscle relaxant [Tolperisone SR] tablet was also added for about 10 days. Patients were encouraged to continue physical exercises at home by performing flexion, abduction and external rotation movements many times a day.

	Patients treated with Triamcinolone acetonide 40mg	Patients treated with Methylprednisolone acetate 40mg
Number	110	100

Gender

Male	50(45.4%)	35 (35%)
Female	60(54.5%)	65 (65%)

Age (years)

Male	35-55 yrs.	32-56 yrs.
Female	35-65yrs.	30-60 yrs.

ORIGINAL ARTICLE

Side Involved

Right	66(60%)	62(62%)
Left	44(40%)	48(48%)

Cause

Diabetes	28(25.4%)	22(22%)
Post traumatic	23(20.9%)	25(25%)
Primary (idiopathic)	59(53.6%)	53(53%)

Table 1: Distribution of Cases According To Gender, Age, Side Involved and Cause of Frozen Shoulder

The outcome of intervention was assessed at the end of 8 weeks. Patients who made complete recovery or having much improvement were counted as success. The assessment of pain was done using scores of 0 [No pain]; 1 [Mild pain]; 2 [Moderate]; 3 [Severe] & 4 [Severe with night pain]. The assessment of disability was done in terms of regaining full activity of daily living that included grooming, combing, washing & others. Improvement is considered if the patient is pain free irrespective of the range of movement [Table 2].

RESULTS: A total number of 210 patients with frozen shoulder were enrolled in the study. 100 patients were randomly allocated for intra articular injection of Methylprednisolone acetate 40mg & 110 patients with Triamcinolone acetonide 40mg. There were no significant difference between the intervention groups in regard to age and the cause of painful stiff shoulder. However female patients were more in both the groups & the right side was found to be more involved than the left [Table 1].

Improvement in pain scores and the range of movement restriction was same in both the groups. However Triamcinolone acetonide group showed better results in regard to the improvement outcome measure [Table 3]. Further analysis revealed that diabetic patients significantly responded better to Triamcinolone acetonide injection in comparison to Methylprednisolone injection [71.4% versus 54.5%], table 2. Diabetic patients also required less frequent injections of Triamcinolone acetonide compared to those who received Methylprednisolone acetate injection [Table 3]. The success rate of 2 injections of Triamcinolone acetonide was 28.5% compared to 13.6% treated with Methylpredsilone acetate injection [Table 3].

However there was no significant advantage of Triamcinolone acetonide injection in post-traumatic or primary frozen shoulder in respect to number of injections [Table 3].

Triamcinolone acetonide injection were significantly more effective than Methylprednisolone acetate injection in patients with frozen shoulder presenting with higher pain scores [Table 4]. The effectiveness of corticosteroid injections were clearly observed in patients with short duration of illness [<3months] & the efficacy declined as the duration of illness became longer. The efficacy of Triamcinolone acetonide injection was significantly higher than Methylprednisolone acetate in patients with longer duration of illness [4-12 months].

DISCUSSION: From this study, we can come to a conclusion that in the treatment of frozen shoulder especially caused by diabetes mellitus, injection Triamcinalone acetonide has got advantage over Methylprednisolone acetate. More number of patients were found to be of female population and dominant right hand side was involved in more number of cases.

ORIGINAL ARTICLE

Male female ratio was approximately 1:1.5. In regard to age and cause of frozen shoulder, our study was in agreement with other studies.^{2,15} Diabetes mellitus was found to be the cause of frozen shoulder in 23.8% of patients. Our study had the largest number of patients in primary (Idiopathic) group (53.3%). The incidence of frozen shoulder in diabetes mellitus patients is reported to be 10-36%.¹⁶ In regard to improvement of baseline pain score and degree of shoulder movement disability in the two groups of Triamcinalone and methylprednisolone, the triamcinalone group seemed to have a little bit better result.

Diabetes mellitus patients responded in a better way after receiving triamcinalone acetonide injection. It is well known that frozen shoulder in diabetic patients is more severe and resistant to treatment.¹⁷ In our study, 71.4% of diabetic patients treated with triamcinalone acetonide showed better result than 54.5% treated with methylprednisolone injection. In agreement with other studies, primary (Idiopathic) and posttraumatic painful shoulder patients in higher percentage of cases showed better result with any corticosteroid injection.^{18,19}

We also observed that the effectiveness of corticosteroid injection declines as the severity of illness goes up and this decline in effectiveness is significantly higher in patients treated with methylprednisolone acetate injection. In this trial we have seen that the effectiveness of the two corticosteroid preparations decline as the history of illness is prolonged, but this decline is more with methylprednisolone injection.

Intraarticular methylprednisolone acetate injection had no advantage in restoring shoulder motion, but partial transient pain relief occurred in two-third of patients (Rizk et al).²⁰ It is well known that intraarticular injections of steroids are not indicated in adhesive phase, and aggressive stretching exercise is considered, aiming to regain the range of movements. From our study, it seems that the effectiveness of triamcinalone acetonide may be extended to adhesive phase in addition to painful freezing phase.²¹

Cause	All patients N=210	Triamcinalone Group. n=110	Methylprednis. Group. n=100
Diabetes	50(23.8%)	20(71.4%)	12(54.5%)
Post traumatic	48(22.8%)	16(69.5%)	15(60%)

Table 2: Percentage of patients that showed improvement in regard to the cause

Primary (Idiopathic) 112(53.3%) 41(69%) 40(75%)

Cause	All	No. of injections Triamcinal			All	No. of injections Methyl pred		
		1	2	3		1	2	3
Diabetes	28	0	8	20	22	0	3	19
Post traumatic	23	1	10	12	25	0	1	24
Primary	59	15	18	26	53	16	17	20
Total	110	16	36	58	100	16	21	63

Table 3: No. of patients that showed improvement in outcome measures in regard to the No. of injections

ORIGINAL ARTICLE

Pain Scores	All N=210	Triamcenalone 40mg. n=110	Methylpred 40mg. n=100
(Mild)	36	20(55.5%)	16(44.4%)
(Moderate)	40	20(50%)	20(50%)
(Severe)	98	48(48.9%)	50(51%)
(Severe with night pain)	36	22(61%)	14(38.8%)

Table 4: Percentage of patients with frozen shoulder showing improvement in regard to pain score

REFERENCES:

1. Croft P. soft tissue rheumatism. In; Silman aj, Hoshberg MS, editors. Epidemiology of the rheumatic disease. Oxford: Oxford medical publications 1993; 375-421.
2. Van der windt DAWM, Koes BW, de jong BA, Bouter LM. Shoulder disorders in general practice; incidence, patient characteristics and management. *Ann Rheum dis* 1995;54:959-64.
3. Lamberts H, Brouwer HJ, Mohrs J. Reason for encounter. Episode and process oriented standard output from transition project. Part1. Amsterdam, Department of family medicine/general practice. University of Amsterdam 1991.
4. Anton HA. Frozen shoulder. *Canadian family physician* 1993;39:1773-1778.
5. Van der Heijden GJMG, Van der windt, de winter AF: Physiotherapy for soft tissue shoulder disorders: a systemic review of randomized clinical trials. *BMJ* 1997;315; 25-30.
6. Van der Heijden GJMG, Van der windt, de winter AF: Physiotherapy for soft tissue shoulder disorders: a systemic review of randomized clinical trials. *Br J Gen Pract* 1996; 46:309-16.
7. Green S, Buchbinder R, Glazier R, Forbes A: systemic review of randomized controlled clinical trials of interventions for painful shoulder: selection criteria, outcome assessment and efficacy. *BMJ* 1998; 316:354-60.
8. Hazleman BL. the painful stiff shoulder. *Rheumatol phys Med* 1972; 11:413-421.
9. Dias R, Cutts S, Massoud S. Frozen shoulder. *BMJ* 2005; 331:1453-1456.
10. Widiastuti- SamektoM, Sianturi GP. Frozen shoulder syndrome: comparision of oral route corticosteroid and intraarticular steroid injection. *Med J Malaysia* 2004; 59:312-316.
11. Van der windt DAWM, Koes BW, Deville W, Boeke APJ, de jong BA, Bouter LM. Effectiveness of corticosteroid injections varsus physiotherapy for treatment of painful stiff shoulder in primary care: randomized trial. *BMJ* 1998; 17:1292-1296.
12. Carrette S, Moffet H, Tardiff, Bossette L, Morin F, Framont P et al. Intraarticular steroids, supervised physiotherapy, or a combination of the two in the treatment of adhesive capsulitis of the shoulder: a placebo controlled trial. *Arthritis Rheum* 2003; 48:829-838.
13. Bakker JF, de jong L, Longuire M, Mens J, Oosterhuis WN, Poppelers A, et al. Standard Schouderklachten (Practice guidelines for shoulder complaints). *Huisarts Wet* 1990; 33:196-202.
14. Jacobs LG, Barton MA, Wallace WA, FerrousisJ, Dunn NA, Bossingham DA. Intraarticular distension and corticosteroids in the manafement of adhesive capsulitis of the shoulder. *BMJ* 1991; 302:1498-1501.

ORIGINAL ARTICLE

15. Siegel LB, Cohen NJ, Gall EP. Adhesive capsulitis: A sticky issue. *Am Fam Physician* 1999; 59:1843-1852.
16. Bunker TD, Anthony PP. The pathology of frozen shoulder. A Dupuytren-like disease. *J Bone Joint Surg Br.*1995; 77:677-683.
17. Griggs SM, Ahn A, Green A. Idiopathic adhesive capsulitis. A prospective functional outcome study of nonoperative treatment. *J Bone Joint Surg Am* 2000; 82-A: 1398-1407.
18. Winters JC, Sobel JS, Gronier KH, Arendzen HJ, deJong B. Comparison of physiotherapy, manipulation and corticosteroid injection for treating shoulder complaints in general practice: randomized single blind study. *BMJ*1997; 314:1320-1325.
19. Ryans I, Montgomery A, Galway R, Kernohn WG, Mckane R. A randomized controlled trial of intraarticular triamcinalone and/or physiotherapy in shoulder capsulitis. *Rheumatology (Oxford)* 2005; 44:529-535.
20. Rizk TE, Pinala RS, Talaiver AS. Corticosteroid injections in adhesive capsulitis: investigation of their value and site. *Arch Phys Med Rehabil*1991; 72:20-22.
21. Thomas E, Vanderwindt, Hay EM, Smidt N, Dziedzic K, Bounter LM et al. Two pragmatic trials of treatment for shoulder disorders in primary care, general ability, course, and prognostic indicators. *Ann Rheum Dis* 2005; 64:1056-61.

AUTHORS:

1. Sanjib Goswami
2. Prabin Ch. Gogoi

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Orthopedics, Fakhruddin Ali Ahmed Medical College, Barpeta, Assam.
2. Assistant Professor, Department of Orthopedics, Fakhruddin Ali Ahmed Medical College, Barpeta, Assam.

FINANCIAL OR OTHER

COMPETING INTERESTS: None

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Sanjib Goswami,
H/No. 7, Bye Lane No. 4,
Bishnu Path,
Rukminigaon, Ghy-22.
E-mail: drsanjibgoswami@rediffmail.com

Date of Submission: 09/10/2015.
Date of Peer Review: 10/10/2015.
Date of Acceptance: 13/10/2015.
Date of Publishing: 19/10/2015.