

Comparative Efficacy of Triamcinolone Acetonide and Methylprednisolone along with Local Anaesthetics in the Management of Frozen Shoulder

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Abstract

Objective: To study the comparative efficacy of Triamcinolone acetonide and Methylprednisolone along with local anaesthetics in the management of capsulitis of shoulder joint (frozen shoulder).

Material and Methods: Forty eight patients suffering from capsulitis of shoulder joint (frozen shoulder) were prospectively randomized into two treatment groups. Three intra articular injections in to the shoulder given at six week interval by the same technique and followed up 8 weeks from the start of treatment. Clinical assessment is done by abduction, forward flexion and external rotation. Improvement in pain levels an

assessed by visual analogue scale.

Results: All patents reported improvement during the study. Analysis of the mean improvement in abduction, forward flexion and external rotation, showed these to be significantly greater in the triamcinolone than with methylprednisolone in local anaesthetic. No severe complications occurred as a result of the injections, related to steroids or local anaesthetic.

Conclusion: Intra articular injection of triamcinolone with local anaesthetic proved useful in the management of capsulitis of shoulder, therefore recommended for the treatment of Frozen-Shoulder.

Key Words: Capsulitis of shoulder, Intraarticular injection, steroids, visual analogue scale.

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Introduction

Frozen shoulder is a painful and debilitating condition affecting 1% to 5% of the general population.^{1,2} Frozen shoulder can be classified as primary (or idiopathic) when patients display symptoms with no identifiable cause and secondary when there is a known cause, such as diabetes mellitus, or an existing injury.³ The term “frozen shoulder” was first introduced by Codman in 1934, characterized by considerable pain and insidious shoulder stiffness, which results in near complete loss of passive and active forward elevation and external rotation.⁴ Frozen shoulder patients usually present in the sixth decade of life, and onset before the

age of 40 is very uncommon and occurs slightly more often in women than men⁵, however, Bunker suggested that the prevalence may be more equal amongst males and females than found historically.² In 6 – 17% of patients, the other shoulder becomes affected, usually within five years, and after the first has resolved.

Many treatment modalities have been described in the literature^{3,5} and include: physical therapy; oral corticosteroids; NSAIDs; injections (corticosteroid, local anaesthetic, sodium hyaluronate and calcitonin); articular or arthrographic distension; manipulation under anaesthesia; arthroscopic and open surgery; or a combination of modalities., although there is no consensus about how to manage patients with frozen shoulder. These therapies provide limited benefits and most patients slowly improve over 12 – 24 months.⁶

Hazleman performed a meta – analysis on the use of intraarticular steroids, and found that the success of the treatment depended on the duration of symptoms.⁸ Patients who received the injections earlier in the course of the disease recovered more quickly. Recent meta-analysis conducted on randomized controlled trial showed that subacromial injections of corticosteroids are effective for painful shoulder to a 9-month period.⁸ Intraarticular steroid injections are not indicated in the adhesive phase as the inflammatory stage of the disease has passed.⁵ Van der Windt et al showed that steroid injections are more effective than physiotherapy alone at 6 weeks.⁹ Moreover, single intraarticular steroid injection in combination with physiotherapy is effective in reducing both pain and disability.¹⁰

The aim of our study was to compare efficacy of Triamcinolone acetonide and Methylprednisolone along with local anaesthetics in the management of capsulitis of shoulder joint (frozen shoulder).

Methodology

This prospectively randomized study was conducted between 1st August 2009 and 30th January 2010 in the pain management clinic PUMHSW Nawabshah. The research ethics committee PUMHSW Nawabshah approved the study. We conducted a randomized trial and compared the efficacy of triamcinolone acetonide and methylprednisolone along with local anaesthetics in frozen shoulder. We tested the null hypothesis that neither of the injection is superior to the other.

The diagnosis of frozen shoulder (capsular syndrome) was made using the diagnostic guidelines for shoulder complaint issued by the Dutch College of

General Practitioners.¹¹ The inclusion criteria were that patients had a painful restriction of glenohumeral mobility lasting for more than 3 months, less than 2 years, age 18 years or more, and gave informed consent. Patients were excluded if they had unwillingness to participate in the trial, bilateral symptoms; treatment with corticosteroid injections or physiotherapy during the preceding six months; contraindications to treatment; surgery, dislocation, or fractures in the shoulder area; diabetes mellitus, systemic disorders of the musculoskeletal system, or neurological disorders, patients with cancer and patients not expected to be able to follow treatment or follow-up protocol for practical or other reasons and reduction of glenohumeral range of motion for reasons other than “classic” adhesive capsulitis, e.g. X-ray signs of glenohumeral arthritis, dislocation or full-thickness rotator cuff tears with displacement of the humeral head.

Forty eight patients suffering from frozen shoulder were randomly allocated by drawing closed envelope from a box. In all enrolled patients the basic laboratory investigations like CBC, FBS or RBS, blood urea and serum creatinine, and urine analysis were carried out routinely. ECG was done in patients more than 35 years of age and X-ray when indicated. The entire procedure was explained to the patient. The participants were divided into group A and B.

Patients were randomized to one of the following interventions:

1. Injection (INJ) Bupivacaine 0.5%, 3 ml (15 mg) and Injection Triamcinolone Acetonide 40 mg (1 ml).
2. Injection Bupivacaine 0.5%, 3 ml (15 mg) and Injection Methylprednisolone 40 mg (1 ml).

The author performed all interventions at OT of pain management clinic according to a standardized protocol. After all aseptic measures and skin infiltration with 2% xylocaine Injection, the posterolateral approach is followed, which is safe and easy to execute:

- The posterior tip of the acromion is palpated, and the needle is inserted into the space between the acromion and the head of the humerus.
- The needle is angled anteriorly toward the coracoid process.
- Once in the space, the syringe is drawn back to ensure that the needle is not in a vascular structure.
- Resistance during delivery of the medication remained minimal.

After performing the block patients were placed immediately in supine position. After 2 hours range of movements at shoulder joint was assessed by clinical

examination and pain was assessed by Visual Analogue Scale (VAS).

Three intra articular injections in to the shoulder given at six week interval by the same technique and followed up 8 weeks from the start of treatment .In the next 2 days, all the patients were assessed daily for improvement in range of movements and pain levels.

The assessment of pain was by using scores of; 0 (no pain); 1 (mild); 2 (moderate); 3 (severe); 4 (severe night pain that interferes with night sleep). The assessment of disability was in term of regaining full activity of daily living that included grooming, combing, washing, and others. The changes in scores of pain symptom and disability at the end of trial was calculated for each patient and compared with those at baseline. The study is undertaken to evaluate the quality and duration of analgesia and improvement in range of movements at shoulder joint.

All collected data was analyzed by using statistical package for social science (SPSS) software version 10.0. Continuous data was analyzed by student’s t-test and categorical data by Chi-square test. Frequency and percentage was computed for categorical variables like gender. Mean and standard deviation was calculated for quantitative variables like age, weight, ASA physical status. A p value < 0.05 was considered significant.

Results

A clinical study of 48 patients of either sex, belonging to different age group enrolled. The average mean age of patients is 40.50 ± 10.79 (S.D.) years, 16 (33.3%) were male and 32(66.6%) were females. A large number of cases are in the age group of 36 – 45 years (33.3%) and 46 – 55 years (25%). The minimum age

of the patients is 36 years and the maximum is 60 years. Table 1.

Table 1: Age and Sex distribution.

Age in years	Group A		Group B	
	Male	Female	Male	Female
35 – 45	2	4	1	4
46 – 55	4	4	3	7
56 – 65	2	8	5	5
Total	8	16	8	16

These patients belong to ASA grade-1 and 2 and they underwent two different pharmaceutical types of intraarticular interventions.

Intensity of pain and disability in the two study groups were similar. Forty patients recovered at a mean time of three months. Forty – eight patients were allocated randomly to intraarticular injections: 23 with triamcinolone acetonide (40 mg) and 23 patients with methylprednisolone acetate (40 mg). There was a statistically significant difference ($\chi^2 = 5.12, df = 1, p < 0.025$) between the 2 intervention groups in favor with triamcinolone acetonide injections in regard to the improvement outcome measures. Triamcinolone acetone injections were patients with frozen shoulder presented with high pain significantly more effective than methylprednisolone injections in patients with frozen shoulder presented with high pain scores Table 2.

The effectiveness of corticosteroid injections were clearly observed in patients with short duration of illness (< 3 months) and this efficacy declined as the

Table 2: Distribution of 48 patients (48 affected shoulders) entered into study.

		Triamcinolone Acetonide with local Anaesthetics (24 patients)	Methylprednisolone with local Anaesthetics (24 patients)
Total shoulders		24	24
No in men		7	8
No in women		17	16
Mean age (years)		53	52
Mean duration of symptoms (months)		6	6
Dominant side:	Right	20	19
	Left	4	5

duration of illness became longer. The efficacy of triamcinolone acetonide injections was significantly higher than that of methylprednisolone acetate in patients with longer duration of illness (4 – 12 months) ($\chi^2 = 7.17$, $df = 1$, $p < 0.01$).

Most patients reported mild pain when describing the procedure. However, two patients in the group A and three patients in group B felt that the injections were very painful. Other possible side effects were reported by 05 patients in the group A and 07 patients in group B. These were usually mild and lasted only for a few days. Two patients in each group reported a minor loss of sensation in affected arm. Formal statistical tests to compare adverse reactions in the two groups were not made.

Discussion

This trial showed that intraarticular triamcinolone acetonide injections for treatment of painful frozen shoulder are superior to methylprednisolone acetate injections

In this trial, the male: female ratio is 4.1 and the left shoulder (such as, the non-dominant shoulder) is involved by more than 1.5 times of the right one.

Although there were no significant differences in baseline pain scores and degree of shoulder movement disability between the 2 intervention groups, these outcome measures tended to be a little bit more in patients received triamcinolone acetonide. Despite of these differences, patients treated with triamcinolone acetonide are significantly responded better than those treated with methylprednisolone acetate.

There are many methods of treating frozen shoulder and variable success has been claimed. Symptoms of frozen shoulder show much improvement when treated with deep heating and stretching exercise combined. Superficial heating alone was less effective. Traditionally stretching exercises have been used to stretch the shoulder capsule. Continuous passive motion has shown more promising results as compared to this traditional practice. Combining oral steroids, on steroid anti-inflammatory drugs and physiotherapy, provide good pain relief that usually does not extend beyond six weeks.

Corticosteroid injections of whatever preparations are effective in higher percent in management of painful stiff shoulder of primary type or post-traumatic cause.¹²⁻¹⁶

Most studies agreed that the effectiveness of corti-

costeroid injections were observed in painful freezing (10 – 36 weeks) phase and useless in adhesive phase (4 – 12 months).^{17,18} In this trial, the effectiveness of the 2 corticosteroid preparations decline as the history of illness is prolonged, but this decline is significantly more with methylprednisolone acetate injections.

Rizk et al 1991 found that intraarticular methylprednisolone injections had no advantage in restoring shoulder motion but partial, transient pain relief occurred in two – third.¹⁹ From our results, it seems that the effectiveness of triamcinolone acetonide injections may be extended to adhesive phase in addition to painful freezing phase.²⁰

It is unlikely to attribute these findings, firstly, to the difference in dosage form as fixed dose is used in this there were no pharmacokinetic or pharmacodynamic differences between triamcinolone acetonide and methylprednisolone acetate.²¹

And thirdly, some studies believed that better clinical outcome is related to the accurate intraarticular injections and they advised to do it under fluoroscopy.^{22,23}

Conclusion

Intraarticular triamcinolone acetonide injection is better than intraarticular methylprednisolone injections in the management of frozen shoulder and effectively improves pain and disability so recommended for frozen shoulder therapy.

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