
Assessment of therapeutic modalities of aseptic subacromial bursitis in Iraqi patients

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Abstract

Objectives: This study is aimed to evaluate the beneficial effect of intra-bursal injection of single dose of triamcinolone acetonide and lidocaine mixture in patients with subacromial bursitis and to practice it as dramatic outpatient response.

Methods: Patients with shoulder pain who referred to the outpatient consultant clinic of rheumatic diseases at Al-Yarmouk teaching hospital in Baghdad, Iraq were allocated for the study. One hundred patients fulfilled the clinical diagnosis of subacromial bursitis were managed either with injection of a mixture of triamcinolone acetonide (40 mg/ml) and 1ml of 2% lidocaine in the subacromial bursa (Group I, n= 56) or oral nonsteroidal anti-inflammatory drugs (NSAIDs) combined with ultrasound therapy (Group II, n=44). The patients were clinically assessed.

Results: Full recovery was observed in all patients of group I, while only 5 patients were responded in group II (one of them is on selective cyclooxygenase enzyme inhibitors). A trial of intra-bursa injection of triamcinolone acetonide and lidocaine was done to patients not responded (n =39) to NSAIDs (Group II). The trial showed full recovery in 34, partial recovery in 4 and no effect in one patient. Diabetic patients responded better to intra-bursa steroid than NSAIDs (12 vs 1 respectively).

Conclusion: We concluded that intra-bursa injection of a triamcinolone acetonide and lidocaine mixture afforded high percent of recovery within short period of time.

Key words: Subacromial bursitis, Triamcinolone acetonide, nonsteroidal anti-inflammatory drugs.

Introduction

Subacromial bursitis is a common cause of shoulder pain that is usually related to inflammation of bursa or induced by crystal precipitation. It can occur as a result of overuse injury and impingement of the subacromial contents, but may also occur in association with other medical conditions, such as rheumatoid arthritis, polymyalgia rheumatica and gout.¹ The inflammatory process of bursitis is mediated by cytokines, chemokines, and cyclooxygenases.² It is frequently associated with supraspinatus tendonitis because inflammation extends from one structure to the next.^{3, 4} Patients often exhibit tenderness over the greater tuberosity. Difficulty in active abduction, painful resistive abduction and external rotation can usually be elicited. Ultrasound scan is often the most helpful test to diagnose subacromial bursitis. Nowadays magnetic resonance image (MRI) is the gold standard diagnostic modality for the diagnosis of bursitis of the shoulder but physical examination may be as reliable as MRI.^{5, 6} Non steroidal anti-inflammatory drugs [NSAIDs] are commonly used to relief mild to moderately severe pain. Downing and Weinstein [1968] reported that ultrasound therapy adds no further benefit over exercise treatment and NSAIDs or exercise treatment alone for patients who have supraspinatus tendonitis, subacromial bursitis and adhesive capsulitis.⁷ Injection of glucocorticoid and local anesthetic mixture may be considered when the pain is persistent or is severe at night.⁸⁻¹⁰ Repeated intra-bursa methylprednisolone (20 mg) reduced the inflammation by suppressing migration of polymorphonuclear leukocytes and reducing the capillary permeability.¹¹ Though single subacromial injection of methylprednisolone has no beneficial

impact in patients with persistent post-traumatic impingement of the shoulder¹¹, while Yu *et al* (2006) found that satisfactory improvement in amount of pain and range of motion in 91% of patients after single injection of a mixture of 1 ml of 2% xylocaine and 1 ml of betamethasone suspension (0.1%)³. Recently Rutten *et al* reported that blind injection into the subacromial bursa is as reliable as ultrasound-guided injection and could therefore be used in daily routine.¹²

In outpatient practice, most patients with severe pain seek a dramatic response; therefore, it is worth to use single intra bursa injection of triamcinolone acetonide (40 mg/ml) and lidocaine (1 ml of 2%) mixture in patients with subacromial bursitis in attempt to relieve pain and improves the daily activities dramatically.

Materials and methods:

From January 2006 to February 2008, patients with shoulder pain who referred to outpatient rheumatic consultant clinic at Al-Yarmouk teaching hospital in Baghdad, Iraq were allocated to participate in the study. This study was approved by the ethics committee of institutional review board. Patients eligible for the study were those with a newly presumptive diagnosis of subacromial bursitis.

The diagnosis was performed on the following clinical criteria; lateral and/or anterior shoulder pain radiated to above of elbow joint. It worsens with movement or activity. Tenderness is found laterally below the acromion. The range of shoulder movement is reduced; decreased elevation, internal rotation and abduction. Painful arc of motion is observed between 60 and 180 degrees of abduction. Passive movements of glenohumeral joint were full.

Resistive active external rotation and abduction were painful. Patients with history of any of the following conditions (based on clinical and radiological examinations) were excluded: fracture in the proximal part of humerus or acromion, frozen shoulder, rotator cuff tendonitis, cervical radiculopathy and radiological evidence of glenohumeral joint or acromio-clavicular inflammation. Diabetic patients and those with radiological osteoarthritic changes of shoulder joints were not excluded from the study.

Laboratory investigations including complete blood picture, erythrocyte sedimentation rate (ESR), fasting plasma glucose, serum uric acid and rheumatoid factor (IgM), as well as X-ray of shoulder joints and chest were done. A total number of 100 patients (67 male and 33 female) fulfilled the above criteria and consented to participate in the study. The patients were grouped, according to the clinical assessment taking in considerations the severity of illness, limitation of daily activities, and history of limited effectiveness of previous oral nonsteroidal anti-inflammatory drugs (NSAIDs) prescription, into two groups:

Group I (n=56): received subacromial triamcinolone acetonide injection performed using aseptic technique and a lateral approach. The skin is prepared with povidone and a mixture of 1 ml of 2% lidocaine and triamcinolone acetonide 40 mg/ml was injected into the subacromial space without difficulty i.e. easy flow of fluid without resistance indicated the needle is in the bursal sac. A sterile disposal syringe (23 G needle) was used. All patients five minutes after injection can fully abduct the shoulder actively with minimal pain.

Group II (n=44): received nonsteroidal anti-inflammatory drugs (NSAIDs) and ultrasound therapy combination. The selection of NSAIDs depends on patient previous experience with NSAIDs, co-morbidities and physician experience. Therefore, selective COX-2 inhibitors are prescribed to patients who had history of intolerance to non selective NSAIDs.

Oral NSAIDs included non selective COX inhibitors (indomethacin 75mg/d, diclofenac sodium 100 mg/d, naproxen 1000 mg/d, Ibuprofen 1800mg/d) or selective COX-2 inhibitors (celecoxib 200mg/d, meloxicam 15 mg/d). Ultrasound therapy was applied three times per week for 4 weeks. The ultrasound delivered (the mean dose was 2 Watt/cm²) to the shoulder through an ultrasound set supplied by Electro Medical Supply (EMS), Wantage, Oxfordshire (U.K.). No physical therapy regimen was practiced in this study.

The shoulder function was clinically evaluated taking in considerations the pain severity, activity level, range of movement and strength weekly up to the end of four weeks.^{13,14}

Patients related to each group of treatment who did not improve or express partial improvement, after 4 weeks, were given a mixture of triamcinolone acetonide (40 mg) and 1 ml of 2% lidocaine.

Statistical analysis:

The data are presented as number, percentage, range and whenever possible as mean \pm SD. The data are analyzed using unpaired two-tailed Student's 't' test and difference between percentage tests, taking $p \leq 0.05$ as the lowest limit of significance.

Results

Table 1 showed the characteristics of the study. Two third of patients were males and there is no significant difference between males and females regarding age and duration of illness. Thirteen cases with diabetes mellitus (13%) were admitted in the study, nine of them were allocated to receive a mixture of triamcinolone-lidocaine injection. Right subacromial bursitis diagnosed in 61 of patients.

Laboratory investigations of both groups were within normal values, and non of our patients had high serum uric acid level or positive rheumatoid factor.

Table 1: Characteristics of the study

Variable	Group I (n=56)	Group II (n=44)
Gender		
Male	39	28
Female	17	16
Age (year)	48.5 \pm 10.1 (36-70)	52.4 \pm 9.9 (36-75)
History of diabetes mellitus (No.)	8	5
Duration of shoulder pain (week)	5.33 \pm 3.46 2-16	5.1 \pm 2.6* 2-12
Site of shoulder pain		
Right	37	24
Left	18	19
Both	1	1

* $p < 0.05$

Table 2: Distribution of recovered patients in respect to non steroidal anti- inflammatory drugs (NSAIDs) therapy.

Drug therapy	Number of prescription	Number of recovery
Non selective NSAIDs		
Diclofenac sodium	23	2
Naproxen	7	2
Ibuprofen	1	0
Indomethacin	1	0
Selective NSAIDs		
Celecoxib	11	1
Meloxicam	1	0

Abnormal x-ray findings were observed in 10 patients (8 male and 2 female). The abnormalities were mild osteoarthritic changes in glenohumeral joint in nine patients.

All of patients received a mixture of triamcinolone-lidocaine injection in group I achieved full recovery within 18 – 35 days and two of them required second injection after 3 weeks interval.

Only five out of forty four patients (11.4%) belonged to group II showed full recovery within 28 – 35 days, one of them is diabetic (Table 2] that is significantly ($p < 0.001$) less than corresponding Group I. Thirty nine patients from group II who failed to respond to NSAIDs and ultrasound therapy were given a mixture of triamcinolone-lidocaine injection, two of them required two repeated injections, four of them showed partial recovery and one of them did not show any response and the remaining number ($n=32$) showed full recovery with single injection of triamcinolone-lidocaine mixture. Patients who failed to show any response have normal laboratory testing and radiological pictures.

Discussion

This study demonstrates the superiority of intra bursa injection of triamcinolone acetonide and lidocaine mixture over combined therapy of oral non steroidal anti-inflammatory drugs and ultrasound therapy in treating subacromial bursitis. Although the accurate diagnosis of subacromial bursitis is by ultrasonography and magnetic resonance image of shoulder, clinical diagnosis is reliable when there is shortage in this technique.^{5,15} The present study demonstrates that the beneficial effect of NSAIDs is observed in 11.4% (5 out of 44 patients). This finding is in agreement with that reported by Petri et al.¹⁶ Intra-bursa injection of corticosteroids has also shown the beneficial effect of steroids.⁸ Meta-analysis revealed that subacromial injections of corticosteroids improved rotator cuff tendonitis up to 9-month period and they also are more effective than NSAID medication.¹⁷ It is well known that the effectiveness of intra-bursa injection of steroid is short lived and it declines with time, therefore, the long term recovery outcome of our patients is not

known because of the short follow-up period. This study adds three important observations. First, the effectiveness of ultrasound therapy is limited and the use of oral NSAIDs is useful. Recently, six studies are reviewed, and found that corticosteroids injections have greater effect in the short term compared with physiotherapy interventions.¹⁸ The response rate to triamcinolone acetonide is higher than that reported by Chávez-López et al, this may be related to the severity of condition because patients with poor pretreatment clinical index were least likely to improve.¹⁹

The second is the ineffectiveness of selective COX-2 in 11, a finding in agreement with Knorth *et al* (2005) reported that the inflammation of bursitis, *in vitro* study, is mediated by COX-1.²⁰ As early as 1987, Petri et al compared in a randomized double blind placebo controlled study of 100 patients who had painful shoulder between subacromial injection of triamcinolone acetonide and naproxen and they found that naproxen was superior to placebo while triamcinolone acetonide was superior to naproxen in relieving pain.²¹ Finally Single injection of intra-bursa steroid is very effective in diabetic patients and it does not add adverse reactions as with oral NSAIDs. One of the study limitations is to follow-up the patients for long period to show for how long the intra-bursa injection is effective. It concludes single injection of triamcinolone acetonide with lidocaine is an excellent short term and promising pharmacotherapy therapy for subacromial bursitis in outpatient clinic.

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