

Comparison of Local Corticosteroids versus Plasma Rich Protein for Management of Rotator Cuff Tendinopathy

UMAIR SALEEM¹, MUHAMMAD KAMRAN AFZAL², MUHAMMAD SAQIB³, MUHAMMAD FAREED AZAM⁴

¹Senior Registrar, Department of Orthopaedic Surgery, POF Hospital Wah Cantt

²Senior Medical Officer, Department of General Surgery, POF Hospital Wah Cantt

³Senior Registrar, Department of General Surgery, POF Hospital Wah Cantt

⁴Senior Registrar, Department of Anaesthesia, Izzat Ali Shah Hospital Wah Cantt

Correspondence to Dr. Umair Saleem, Cell: 0333-5454585 E-mail: umair_saleem@hotmail.com

ABSTRACT

Background: Rotator cuff (RC) tendinopathy accounts for majority of shoulder conditions in adult patients resulting in shoulder pain and occupational disability. Recently injections around joint area typically including corticosteroid, local anaesthetic, opioid and a non-steroidal anti-inflammatory drug (NSAID) have been used for treatment of such conditions.

Aim: To compare the efficacy of ultrasound-guided injections of platelet-rich plasma (PRP) and corticosteroids on clinical and functional assessment.

Study design: Double blind randomize controlled trial

Place and duration of study: Department of Orthopaedic Surgery, POF Hospital, Wah Cantt and Izzat Ali Shah Hospital Wah Cantt 1st January 2020 to 31st January 2021.

Methodology: Sixty patients was tendinitis or partial tear of rotator cuff tendon, had pain for >3 months and >40 years old were enrolled. Patients were randomly divided into two groups; Group A patients were administered corticosteroid injections, the Depo-medrol 40mg and Group B patients were administered PRP injections.

Results: The mean age was 55.9±4.3 years in group A while in group B mean age was 55.2±5.2 years. After treatment the mean VAS scores were 4.39±1.8 in group A and in group B was 3.27±1.5. In group A after treatment mean ROM was 28.34±4.6 and in group B mean ROM was 32.64±5.2 (P<0.001) considered significant.

Conclusion: Corticosteroids use limitation of being contraindicated in few individuals and associated risk of tendon rupture. The use of PRP among patients with rotator cuff tendinopathy as results showed marked improvement in pain intensity and range of movements after PRP administration.

Keywords: Corticosteroids, Plasma rich plasma (PRP), Rotator cuff tendinopathy

INTRODUCTION

Rotator cuff (RC) tendinopathy accounts for majority of shoulder conditions in adult patients resulting in shoulder pain and occupational disability. Condition is becoming more common with increasing geriatric population.¹ Incidence of shoulder pain is 0.9–2.5% and prevalence can be as high as 6.7–66.7% during lifetime. Rotator cuff injuries include subacromial impingement syndrome, rotator cuff tendinopathy and subacromial pain syndrome (SAPS).^{2,3} Out of these rotator cuff tendinopathy includes >50% of all shoulder pains.⁴ Conventionally treatment of all such conditions include, physiotherapy, immobilization and NSAIDs.⁵ Recently injections of corticosteroid, local anaesthetic, opioid and NSAID's around the joint region have been used for treatment of such conditions⁶.

Corticosteroid has local anti-inflammatory effects and reduces local stress response to injury but benefits have not been proved in studies.^{7,8} Result have shown corticosteroids to be effective during acute tendinitis, but complications like tendon tear and inhibition of collagen synthesis have been reported with corticosteroid use.⁹ Initial results regarding PRP injection use in rotator cuff (RC) related problems have shown great improvement of symptoms¹⁰. PRP is extracted from whole blood which is rich in platelet resulting in many growth factors release, accelerating tissue repair process^{11,12}. No major complications have been reported with PRP injections use adding to beneficial effects already demonstrated about soft tissue healing¹³.

MATERIALS AND METHODS

This randomized controlled trial was conducted in the POF Hospital, Wah Cantt and Izzat Ali Shah Hospital Wah Cantt. 1st January 2020 to 31st January 2021 after permission from Institutional Ethical Review Board. Patients was tendinitis or partial tear of rotator cuff tendon, had pain for >3 months and >40 years old were included. Patients with radicular pain, complete RC

tendon tear, frozen shoulder or calcified tendinitis, inflammatory diseases such as rheumatoid arthritis, fibromyalgia, polymyalgia rheumatica, were excluded. Non-consecutive randomized selection of patient was done.

Patients were randomly divided into two groups. Group A patients were administered corticosteroid injections, the Depo-medrol 40mg and Group B patients were administered PRP injections. Initially complete medical history and examination of joint was conducted by senior doctor. Ultrasound of shoulder region was performed by senior radiologist to confirm the rotator cuff tendinopathy. In group A, 1cc of Depo-medrol 40mg and 1cc of lidocaine (2%) was injected within the subacromial joint. In group B, 3cc of PRP was injected within the intra-articular joint and another 1cc of PRP was injected at the site of the tendon tear, under guide of sonography. After the injections, both groups were given shoulder exercise, scapula dyskinesia regimens and Tab. Aceta aminophen thrice daily for one week. Patients were then visited 1 week, 1 month, and 3 months after administration of treatment. ROM and VAS were evaluated at 3 months post-intervention.

The data was entered in SPSS version 20. Independent sample T test was used to compare means of VAS score and ROM in both groups. P value ≤0.05 was considered significant.

RESULTS

In group A; age of the patients between 42–65 years and mean age was 55.9±4.3 years while in group B, age of the patients between 43–67 years mean age was 55.2±5.2 years (Table 1). In group A; 8 were females and 22 were males while in group B; 6 were females and 24 were males (Chart 1). In group A before treatment; minimum VAS score was 4 and maximum VAS score was 8, mean VAS score was 5.09±2.3. In group B before treatment; the minimum VAS score was 3, maximum VAS score was 8, mean VAS score was 5.27±2.7. In group A after treatment; minimum VAS score was 2 and maximum VAS score was 7, mean VAS score was 4.39±1.8. In group B after treatment; the minimum VAS score was 2, maximum VAS score was 5, mean VAS score was 3.27±1.5. Independent sample t-test was applied on both groups to

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compare mean VAS score post treatment and P-value is significant (Tables 2-3). In group A before treatment; minimum ROM was 15° and maximum ROM was 22°, mean ROM was 18.23±5.63. In group B before treatment; the minimum ROM was 14°, maximum ROM was 23° and mean ROM was 17.86±5.43. In group A after treatment; minimum ROM was 24° and maximum ROM was 32°, mean ROM was 28.34±4.6. In group B after treatment; the minimum ROM was 26°, maximum ROM was 38° and mean ROM was 32.64±5.2. Independent sample t-test was applied on both groups to compare mean ROM post treatment and P-value is significant (Tables 4-5).

Table 1: Descriptive Statistics of age in both groups (n = 60)

Group	Mean±SD
A	66.9±4.3
B	55.2±5.2

Table 2: Descriptive statistics of VAS score before treatment (n=60)

Group	Mean±SD	P value
A	5.09±2.3	0.257
B	5.27±2.7	

Table 3: Descriptive statistics of VAS score after treatment (n=60)

Group	Mean±SD	P value
A	4.39±1.8	0.001
B	3.27±1.5	

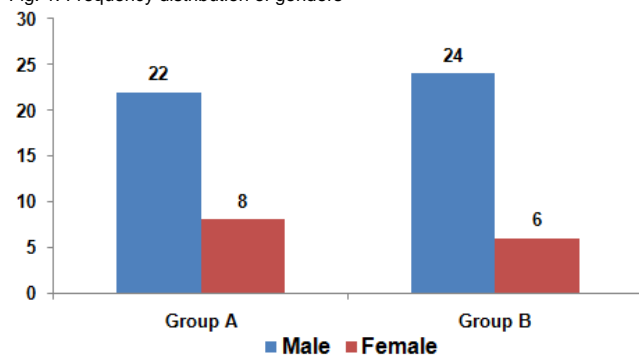
Table 4: Descriptive Statistics of ROM before treatment

Group	Mean±SD	P value
A	18.23±5.63	0.283
B	17.86±5.43	

Table 5: Descriptive statistics of ROM after treatment

Group	Mean±SD	P value
A	28.34±4.6	0.001
B	32.64±5.2	

Fig. 1: Frequency distribution of genders



DISCUSSION

Patients which underwent treatment with PRP injections; significant alleviation of pain post therapy was noted as compared to corticosteroid group. Similarly patients treated with PRP showed improved ROM during our follow-up period. PRP injections contain cytokines which accelerate soft tissues healing.¹⁴ Few clinical evidence in term of studies conducted which support use of PRP for treatment of rotator cuff tendinopathy have been done till now¹⁵.

In our study average age of patients was >40 years. Similarly study conducted by Scarpone et al¹⁶ who showed rotator cuff tendinopathy was common after 40 years' age. In the present study, rotator cuff tendinopathy was more frequently noted on right side. Shams et al¹⁷ conducted a study in patients with partial rotator cuff tendinopathy and similar predisposition was noted in results.

Coombes et al¹⁸ reported unsatisfactory results for reduction of pain improvement in shoulder function post corticosteroid injection therapy. Gaujoux-Viala et al¹⁹ results showed slight

improvement after corticosteroid injections for tendinopathy. On contrary two RCTs conducted by Ikeuchi et al²⁰ and Kwon et al²¹ also showed reduced improvement of symptoms post corticosteroid therapy in periarticular injection.

In 2013, Scarpone et al²² reported that patients initially underwent conventional physical rehabilitation and later on corticosteroids injection were administered in peri-articular region but failed to respond to treatment. Functional scores significantly improved within 2 to 3 months of follow up. Similarly VAS pain score significantly improved at 03 to 12 months follow-up. Range of movement also improved post therapy (p<0.001).

Similar results were seen by Chen et al²³ as patients suffering from rotator cuff injuries were treated with PRP. Post therapy symptoms improved significantly in terms of pain. Say et al²⁴ showed that corticosteroid injections are better than PRP for treatment of subacromial impingement syndrome. In another studies, single injection of PRP for periarthritic pain of shoulder compared to corticosteroid injection showed marked improvement in terms of pain, disability and range of movements.^{25,26} Wesner et al²⁷ similarly compared PRP with placebo in his study. Results showed PRP group having better function and reduced pain compared to placebo group at 6-month follow-up.

CONCLUSION

Corticosteroids use limitation of being contraindicated in few individuals and associated risk of tendon rupture, we recommend use of PRP among patients with rotator cuff tendinopathy as results showed marked improvement in pain intensity and range of movements after PRP administration.

Conflict of interest: Nil

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