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Original Research Article

Management of Adhesive Capsulitis of the Shoulder: PRP and Steroid Injections

Kanhaiya Lal Gupta

Associate Professor, Department of Orthopedics, Katihar Medical College and Hospital, Katihar, Bihar, India

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Corresponding author: Dr. Kanhaiya Lal Gupta
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Abstract

Aim: Significance of platelet rich plasma (PRP) and Corticosteroid injection in management of Adhesive capsulitis of shoulder.

Methods: 50 patients of frozen shoulder after proper clinical and radiological (X-ray, CT, MRI) . in our institute and divided them randomly equally into two subgroups: subgroup A received PRP injection while subgroup B had received methylprednisolone injection. The inclusion criteria of this study was adult more than 18 year and stage 2 or more of per arthritis shoulder, shoulder range of motion decrease to 50% or more than opposite shoulder. All patients of our study advised neither to take any kind of analgesics i.e. NSAIDS nor any massage of shoulder, if patient had severe pain following injection opioids analgesic like the one tramadol can be given to patients. Patients were followed up at 1 week post injection, then after 1 month and then at 3 months.

Results: In this study, there were 60% female patients and 40% were males. Most of the patients are in age group of 41-60 years in both the groups. Most of the patients (60%) were injected with PRP in period of 3-6 months and with inj. MPS also in 3-6 months (56%). There is statistically significant reduction in VAS pain scores after getting either with PRP injection as well as with MPS injection over 3-6 month period. The comparative clinical outcome during the follow-up period with PRP and MPS injection were given and final 3-month follow up suggest 20% patients with excellent, 48% with good and 32% with poor outcome with PRP injection. For subgroup B this was found as 16% excellent, 36% good and 48% poor outcome. The complication rate as PRP is made of patients own blood, there is no such complications except local site post injection pain seen in 14 patients (56%) for some time.

Conclusion: Both PRP and MPS showed good efficacy on treating frozen shoulder. The current study provides strong evidence in support of a statistically significant effect of platelet concentrate in the treatment of frozen shoulder in vivo where steroid contraindicated or refused by patient.

Keywords: Frozen shoulder, platelet, MPS

Introduction

The focus in orthopaedic surgery is changing. Whilst in the previous decades the main focus was to reconstruct destroyed structures, but nowadays the idea of biological repair of defect tissues gains more and more importance. This idea of a biological way to keep our own structures has been expanded to the ligaments and

cartilage as well. Chronic complex musculoskeletal injuries that are slow to heal pose challenges to physicians and researchers alike. Frozen shoulder is a common disorder which is characterised by pain and loss of movement. Its cause is poorly understood and its management is disputed because of lack of supporting evidence.[1] The symptoms are generally self-limiting over one to three years and condition more common in females than males and the greatest incidence occurs in the 5th and 6th decades. The X-ray appearances may show either nothing abnormal or calcific deposits in the capsule or periarticular tissue. The Management is mainly focused on restoring joint movement and reducing shoulder pain, using anti-inflammatory medications, physical therapy, injection of saline with LA and/or surgical intervention including myofascial release. Although all these treatment may "unfreeze" the shoulder but usually, do not completely alleviate the chronic pain.[2] Another practice of modern medicine is to inject methylprednisolone to prescribe anti-inflammatory medications. Platelet-rich plasma (PRP) is an orthobiologic that has recently gained popularity as an adjuvant treatment for musculoskeletal injuries.[3] The platelets contain alpha granules that are rich in several growth factors, such as platelet-derived growth factor, transforming growth factor-ß, insulin-like growth factor, vascular endothelial growth factor and epidermal growth factor, which play key roles in tissue repair mechanisms.[4,5] The PRP injection therapy can have a beneficial effect in the management of frozen shoulder. Since there are very few studies evaluating the beneficial effect of PRP injection therapy versus injection methylprednisolone in the treatment of periarthritis shoulder, we conducted a novel study in our institute to assess its results and biological effects.

Materials and methods

A prospective study was conducted in the Department of Orthopedic , Katihar Medical College and Hospital, Katihar, Bihar, India from March 2017 to Feb 2018.after taking the approval of the protocol review committee and institutional ethics committee. 50 patients of frozen shoulder after proper clinical and radiological (X-ray, CT, MRI) assessment period of September 2020 to august 2021 in our institute and divided them randomly equally into two subgroups: subgroup A received PRP injection while subgroup B had received methylprednisolone injection. The inclusion criteria of this study was adult more than 18 year and stage 2 or more of periarthritis shoulder, shoulder range of motion decrease to 50% or more than opposite shoulder. The patients who had bilateral periarthritis shoulder, stage 1 or lesser grade, less than 18-year age, any superficial or deep infection, any associated fracture, any comorbid condition, diabetic patients and those who were not willing for injection excluded from our study. The PRP injection was making with withdrawing 20-30 ml of patient venous blood and then with addition of sodium citrate double centrifugation was done at 1500 rpm for 6 minute and then at 3400 rpm for 15 min for getting high concentration platelet rich plasma. PRP preparation was activate with calcium gluconate, filled into syringe, and inject into affected shoulder of patients of subgroup A. The injection of methylprednisolone 2cc was inserted to affected shoulder in patients of subgroup B. All patients of our study advised neither to take any kind of analgesics i.e. NSAIDS nor any massage of shoulder, if patient had severe pain following injection opioids analgesic like the one tramadol can be given to patients. Patients were followed up at 1 week post injection, then after 1 month and then at 3 months.

Results

In this study, there were 60% female patients and 40% were males. Most of the patients are in age group of 41-60 years in both the groups. Most of the patients (60%) were injected with PRP in period of 3-6 months and with inj. MPS also in 3-6

months (56%). There is statistically significant reduction in VAS pain scores after getting either with PRP injection as well as with MPS injection over 3-6 month period as depicted in Table 1. The comparative clinical outcome during the follow-up period with PRP and MPS injection were given in Table 2 and table 3 respectively and final 3-month follow up suggest 20% patients with excellent, 48% with good and 32% with poor outcome with PRP injection. For subgroup B this was found as 16% excellent, 36% good and 48% poor outcome (table 4). The complication rate as PRP is made of patients own blood, there is no such complications except local site post injection pain seen in 14 patients (56%) for some time.

Table 1: Comparisons of pain according to VAS during pre and post treatment

Time interval	PRP (Mean ± SD)	MPS (Mean ± SD)
Pre	8.76±0.99	8.48±0.80
Post – 1 week	5.60±2.75	5.92±2.26
Post – 1 month	4.00±3.49	3.92±2.67
Post – 3 month	3.12±3.85	3.12±3.31
P value	<0.00001(S)	< 0.00001 (S)
Chi-square	48.216	40.968

Table 2: Comparisons of Constant score during pre and post treatment (PRP)

Pre	Post - 1 week			Post - 1 month				Post - 3 month			Total
	Good	Fair	Poor	Excellent	Good	Fair	Poor	Excellent	Good	Poor	
Fair	1	2	0	0	2	1	0	0	3	0	9
Poor	4	10	8	1	9	4	8	5	9	8	66
Total	5	12	8	1	11	5	8	5	12	8	75
p value	0.440			0.587				0.158			

Table 3: Comparisons of Constant score during pre and post treatment (MPS)

Pre	Post - 1 week			Post - 1 month				Post - 3 month			Total
	Good	Fair	Poor	Excellent	Good	Fair	Poor	Excellent	Good	Poor	
Fair	3	0	0	1	2	0	0	1	2	0	9
Poor	3	6	13	0	8	2	12	3	7	12	66
Total	6	6	13	1	10	2	12	4	9	12	75
p value	0.005			0.020				0.205			

Table 4: Comparative final outcome at 3 month post injection follow up

Results	PRP	MPS
Excellent	5 (20%)	4 (16%)
Good	12 (48%)	9 (36%)
Poor	8 (32%)	12 (48%)

Discussion

The primary goal of this study was to evaluate the efficacy of intra-articular PRP and corticosteroid injection in patients with idiopathic adhesive capsulitis. The pathology involved in adhesive capsulitis is synovial hyperplasia and capsular fibroplasia with fibrosis and dense capsular scar formation.

Rodeo et al. reported role of cytokines and other inflammatory mediators in patients with adhesive capsulitis and Intra-articular

corticosteroid decreases synovitis limits development of fibrosis.[6,7] Van der Windt et al. compared intra-articular corticosteroid to 6 weeks of physical therapy for patients with painful stiff shoulders and reported significant improvements in pain, disability, and motion in the injection group.[8]

Gam et al[9] treated patients with adhesive capsulitis with either steroid injection or saline injection and distension with 19 cm3 of Lidocaine and found that the distension with steroid group (12 patients) used fewer analgesics and had improved motion compared to the steroid-only group (eight patients). There are many disadvantages of corticosteroid injection have been reported including periarticular calcification, cutaneous atrophy, cutaneous depigmentation, tendon rupture, avascular necrosis, and joint infection[10] but in our study, no significant adverse effect have been reported. Thus, corticosteroid injection in the early stages of adhesive capsulitis leads to significant improvement in range of motion and pain. Our study demonstrated that PRP is not inferior to corticosteroid injection in any of the measured parameters and both of the groups experienced similar benefits from the injection therapies with no statistical differences detected in ROM or VAS scores at 1 week, 1 month and 3 months and no adverse effects were detected in either of any two groups. Our results are consistent with current literature, showing that PRP can be beneficial treatment of adhesive capsulitis.[11,12] The previous studies are controversial in interpreting the efficacy of PRP injections due to the different research and treatment protocols, in many cases involving arthroscopy or different products of PRP, for example PRP fibrin matrix[13,14] and retrospective design and lack of randomization might have been the major limitations of this study.[15,16] The current literatures strongly advices against surgery in conditions like frozen shoulder and favors conservative treatment options.[17] In this perspective, PRP may offer a valid alternative to corticosteroid injection, considering that there are no documented significant adverse effects in PRP treatments unlike in corticosteroid injection treatments.11 The advantages of PRP over CS are the absence of severe complications locally and systematically and more safe and simple treatment while disadvantages of PRP would be more injections required achieving similar outcomes as a single corticosteroid injection. The PRP treatment may be repeated whether symptoms return, but multiple corticosteroid injection should be avoided and concurrent physical therapy is still advised because of its proven benefits, as seen with given the outcomes of our study, we recommend considering PRP as an alternative treatment to CS in order to reduce local and systemic effects involved with CS injections.

Conclusion

We can conclude that both PRP and MPS showed good efficacy on treating frozen shoulder. The current study provides strong evidence in support of a statistically significant effect of platelet concentrate in the treatment of frozen shoulder in vivo where steroid contraindicated or refused by patient. However, inj. Methylprednisolone has sudden onset of action because of anti-inflammatory action with respect to inj. PRP, so has better result at 1 week follow up post injection but in long term (at 3 months follow up) inj. PRP has better effect in compared to injection MPS.

Reference

1. Zuckerman J, Cuomo F. Frozen shoulder. In: Hawkins R, ed. The shoulder: a balance of mobility and stability. Rosemont, Il. AAOS. 1993;253-67.
2. Andews JR. Diagnosis and treatment of chronic painful shoulder: Review of nonsurgical interventions. Journal of Arthroscopic and Related Surg 2005;21(3):333–347
3. Dhillon RS, Schwarz EM, Maloney MD. Platelet-rich plasma therapy –

future or trend? Arthritis Res Ther 2012;14(4):219.
4. Alsousou J, Ali A, Willett K, Harrison P. The role of platelet-rich plasma in tissue regeneration. Platelets, 2012.
5. Bava ED, Barber FA. Platelet-rich plasma products in sports medicine. Phys Sportsmed. 2011;39(3):94-9.
6. Rodeo SA, Hannafin JA, Tom J, Warren RF, Wickiewicz TL. Immunolocalization of cytokines and their receptors in adhesive capsulitis of the shoulder. J Orthop Res 1997;15:427-436.
7. Bunker TD, Anthony PP. The pathology of frozen shoulder. A Dupuytren-like disease. J Bone Joint Surg Br 1995;77:677-683.
8. Vander Windt DAWM, Koes BW, Deville W, Boeke AJP, de Jong BA, Bouter LM. Effectiveness of corticosteroid injections versus physiotherapy for treatment of painful stiff shoulder in primary care. BMJ 1998;317:1292-1296.
9. Gam AN, Schydlowsky P, Rossel I, Remvig L, Jensen EM. Treatment of "frozen shoulder" with distension and glucorticoid compared with glucorticoid alone, a randomized controlled trial. SC and J Rheumatol 1998;27:425-430.
10. Habib GS. Systemic effects of intra-articular corticosteroids. Clin Rheumatol 2009;28:749-756
11. Shams A, El-Sayed M, Gamal O, Ewes W. Subacromial injection of autologous platelet-rich plasma versus corticosteroid for the treatment of symptomatic partial rotator cuff tears. Eur. J Orthop Surg Traumatol 2016;26:837–842.
12. Von Wehren L. The effect of subacromial injections of autologous conditioned plasma versus cortisone for the treatment of symptomatic partial rotator cuff tears. Knee Surg Sports Traumatol Arthrosc 2016;24:3787–3792.
13. Hurley ET, Lim Fat D, Moran CJ, Mullett H. The efficacy of platelet-rich plasma and Plateletrich Brin in arthroscopic rotator cuff repair: A meta-analysis of randomized controlled trials. Am J Sports Med 2019;47:753–761.
14. Randelli P, Arrigoni P, Ragone V, Aliprandi A, Cabitza P. Platelet rich plasma in arthroscopic rotator cuff repair: a prospective RCT study, 2-year follow-up. J Shoulder Elbow Surg 2011;20:518–528.
15. Lewis J. Rotator cuff related shoulder pain: Assessment, management and uncertainties. Man Ther 2016;23:57–68.
16. Diercks R *et al*. Guideline for diagnosis and treatment of subacromial pain syndrome: a multidisciplinary review by the Dutch Orthopaedic Association. Acta Orthop 2014;85:314–322.
17. Ketola S, Lehtinen JT, Arnala I. Arthroscopic decompression not recommended in the treatment of rotator cuff tendinopathy: a final review of a randomised controlled trial at a minimum follow-up of ten years. Bone Joint J 2017;99-B:799–805