

MANAGEMENT OF ADHESIVE CAPSULITIS OF SHOULDER JOINT BY SINGLE PLATELET RICH PLASMA INJECTION

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Article Info: Received 08 February 2021; Accepted 15 March 2021

DOI: <https://doi.org/10.32553/ijmbs.v5i3.1826>

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Conflict of interest: No conflict of interest.

Abstract

Introduction: Adhesive capsulitis is a painful impairment characterized by the restriction of movement of shoulder due to the adhesions across the glenohumeral joint, injection of platelet-rich plasma is effective treatment to reduce the pain and restore the movement of shoulder.

Aim: To assess the effectiveness single PRP injection in management of adhesive capsulitis.

Material and Methods: This study enrolled 12 patients experiencing the shoulder pain for at least 3 months and attending our medical college hospital. Patients with adhesive capsulitis were given a single injection of PRP (4 ml) and followed up for 12 weeks, VAS scores and Disability Index scores were recorded and compared with the baseline scores.

Result: In present study majority of patients were females with mean duration of symptoms was 3 months. Post PRP treatment all the patients have shown significant improvement on pains VAS score, movement VAS score on 2nd, 6th, and 12th weeks follow up.

Conclusion: Present studies conclude that the AC is more prevalent among females which can be treated effectively with PRP technique. PRP as is a simple, safe and cost-effective management of AC without any adverse effects.

Keywords: Adhesive Capsulitis, Platelet-Rich Plasma, Corticosteroid, Intra-articular

Introduction

Adhesive capsulitis (AC) of shoulder is a painful condition manifested by restriction of active and passive glenohumeral movement in at least two directions, most notably shoulder abduction and external rotation.¹

Adhesive capsulitis has a prevalence of 3%–5% in the general population and up to 20% in diabetic population. AC of shoulder is more common in females of age group 40–60 years. Inflammation is a major cause of stiffness, pain, and capsular fibrosis. Risk factors for AC include preceding trauma, HLA-B27 positivity and prolonged immobilization of the glenohumeral joint. AC is associated with diabetes, thyroid, cerebrovascular disease, coronary artery disease, and autoimmune disease. Patients with cerebrovascular disease, especially those surgically treated for subarachnoid haemorrhage, are more susceptible to developing adhesive shoulder capsulitis.²

AC is further categorized as Primary where onset is generally idiopathic and Secondary which results from a known cause, predisposing factor or surgical events, like post-surgery, post-stroke and post-injury. Where post-injury, there may be an altered movement patterns to protect the painful structures, which will in turn change the motor

control of the shoulder, reducing the range of motion, and gradually stiffens up the joint.³

Therapeutic treatments of AC are nonsteroidal anti-inflammatory drugs, intra-articular steroid injections, suprascapular nerve block, platelet-rich plasma (PRP) injection, manipulation under general anesthesia, or arthroscopic capsular release.⁴

PRP is an emerging and effective treatment. Several fundamental protein growth factors that are actively secreted by platelets initiate the wound healing process. Blood activation causes the granules present in platelets to fuse to its cell membrane and release their growth factors (degranulation).⁵ Present study is an attempt to assess the efficacy of PRP as treatment for AC.

Material and methods

Present study was conducted from Sept 2019 to Sept 2020 at the Index Medical College Indore.

As part of this study we have enrolled 12 patients who were attending the hospital due to pain and limited shoulder joint mobility, abduction and external rotation for more than one month and no other ailment in the X-ray examination. Only patients with pain and stiffness in the shoulders for at least 4 weeks, restricted the active and passive range of motion at

the glenohumeral joint and aged between 40 to 60 years were included.

Patients with prior shoulder injury or fracture, patient with skin infections, patients having uncontrolled diabetes or on any medication were excluded from this study.

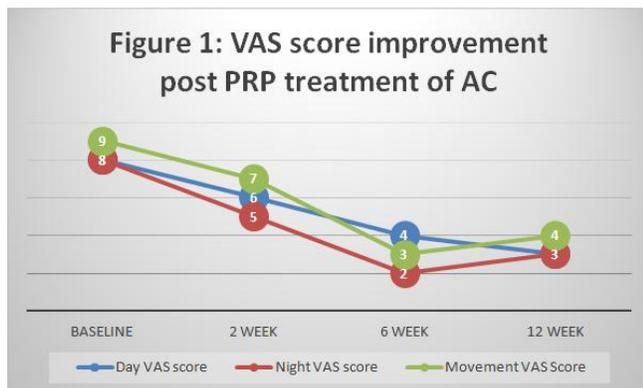
For PRP therapy 35 ml of blood is taken from the peripheral vein of (all) the subjects. PRP was prepared at blood bank by centrifugation method followed by the buffy coat-based harvesting. The harvested PRP contains approximately 4 ml of blood product. With patient in sitting position a 16G needle was used to inject the extracted PRP.

Post PRP injection improvement in day-night pain and pain on shoulder movement is recorded on the visual analog scale (VAS). VAS is a validated, subjective measure for acute and chronic pain. Scores were recorded by making a handwritten mark on a 10-cm line which represents a continuum between “no pain” and “worst pain.”

Results

As part of this study we have recorded the demographic and clinical details of the patients. Recorded mean age of the subjects was 52 ± 6 years where youngest was 42 and oldest was 58 years old. Of these 12 patients 8 were females and 4 were males.

Recorded mean duration of symptoms was 3 months. VAS score was used to record the pain. Post PRP injection improvements were noticed in day VAS score, night VAS score and movement VAS scores on follow up weeks 2, 6, and 12 as compared to the baseline ($p < 0.05$). Significant improvements recorded in active and passive range-of-motion (ROM) on weeks 2, 6 and 12 when compared to the baseline ($p < 0.05$). Post treatment external rotation values were noted to be improved as 70.00 ± 13.22 in 6th week and 83.33 ± 14.14 in 12th week.



Discussion

AC also called frozen shoulder is caused by adhesion in the capsule, which creates pain, joint stiffness and limitation in range of motion. Recently use of PRP for soft tissue treatment has increased. Platelet-rich plasma is a fraction of

whole blood containing concentrated growth factors and proteins and generally has a higher concentration of platelets compared with baseline blood.⁶

Present study recorded significant improvement in the pain VAS score of the patients after the single PRP injection our findings are similar to Barman A, et al 2019 who studied the efficacy of PRP with other treatments and recorded that at 12 weeks, decrements in VAS and total shoulder pain and disability index scores, in IA-PRP group, were 58.4 and 55.1, compared with 48.7. In range of movement, IA-PRP group showed significant improvement in passive abduction (-50.4 vs. -39.4), internal (-36.8 vs. -25.8), and external rotations (-35.4 vs. -25.9). No major complications were observed in any patients.⁷

Another similar study by Aslani et al. (2016) which used single PRP injection as treatment for AC reported a 60% improvement in pain, 70% improvement in functional outcome, where flexion improved from 70° to 150°, abduction improved from 75° to 135°, and external rotation improved from 25° to 50°.⁸

There is no consensus regarding the best treatment for AC. Many different conservative treatments and invasive procedures have been described. Recently PRP has gain popularity due to its fast recovery rate and no adverse effect linked to it.

Agrawal AC et al (2019) reported that PRP treatment showed increase in pain for few participants on 3rd day, causing decreased active range of motion. However, at 1 month, PRP treatment resulted in statistically significant improvements in constant score. No major adverse effect was seen in PRP injection. Which is comparable to our results where patients have shown continuous improvement at 2, 6 and 12th week.⁹

Our study recorded significant improvement in term of shoulder motion, a similar trend was also observed by Kothari et al in their study, IA-PRP group patients showed significant improvements in terms of pain and shoulder motion compared.¹⁰

Conclusion

This study concludes that the PRP as a treatment of AC is simple, safe and cost-effective option. No adverse effect of PRP was recorded and therefore more research should be conducted enhance the efficacy and effectiveness of this modality.

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