

Evaluation of Complications Associated with Injection Methyl Prednisolone & PRP for Shoulder Dysfunctions: An Institutional Based Study

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ABSTRACT

Background: The term “frozen shoulder” as a disease of slow onset, with inability to sleep on the affected side due to severe pain and stiffness in all directions without radiologic abnormalities. The annual incidence of periartthritis is between 3% -5% in the general population & as high as 20% among individual with diabetes. The present study was conducted with the aim to evaluate the complication associated with injection methyl prednisolone and PRP for shoulder dysfunction.

Materials and Methods: The present comparative study was conducted in the Hindu Rao Hospital, Delhi over a period of 24 months. Study subjects were systemically and randomly allocated in two groups of 30 each (Group A and Group B). Two groups of 30 patient each were made. Patient in group ‘A’ were subjected to autologous platelet rich plasma injection and in group ‘B’ were subjected to local injection methyl prednisolone. Regular follow up was performed at 1 month, 2 month, 6 month and any complications were noted and the data thus obtained was arranged in a tabulated form and analyzed using SPSS software.

Results: The $p=0.118$ suggests that there was no statistically significant difference of gender between the two groups. Out of thirty patients, five (16.67%) patients had a minor complication

in form of pain at injection site which subsided over one week. There were 2 cases (6.67%) with pain. Rest of the 26 patients (86.70%) had no associated complication.

Conclusion: Both the method was safe with minimal complication in our study in contrast to literature which shows various adverse effects of steroid.


Keywords: Platelet, Prednisolone, Shoulder, Steroid.

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Article History:

Received: 29-07-2019, Revised: 21-08-2019, Accepted: 18-09-2019

Access this article online	
Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2019.5.5.043	

INTRODUCTION

In 1934, Codman introduced the term “frozen shoulder” as a disease of slow onset, with inability to sleep on the affected side due to severe pain and stiffness in all directions without radiologic abnormalities¹. Demographic studies have shown that most patients with adhesive capsulitis (84.4%) fall within the age range of 40 years to 59 years². The annual incidence of periartthritis is between 3% -5% in the general population & as high as 20% among individual with diabetes. Idiopathic adhesive capsulitis often involves the nondominant extremity, although bilateral involvement has been reported in up to 40% to 50% of cases.³ PRP has emerged as a new technology which is believed to stimulate revascularization of soft tissue & increase the concentration of growth factors to improve & accelerate tendon healing. It is defined as a sample of autologous blood with concentration of platelets & above base line value.⁴ Platelet rich plasma (PRP) contains important growth factors like Platelet derived growth factor, Transforming growth factor beta1, Basic

fibroblastic growth factor, Vascular endothelial growth factor & epidermal growth factor which have been shown to play important role in all phases of healing.⁵ The present study was conducted with the aim to evaluate the complication associated with injection methyl prednisolone and PRP for shoulder dysfunctions.

MATERIALS AND METHODS

The present comparative study was conducted in the Hindu Rao Hospital, Delhi over a period of 24 months. Patients were diagnosed with frozen shoulder based on clinical and ultrasonic examination. All the subjects were informed about the study and a written consent was obtained from them in their vernacular language. For this study we recruited 60 patients (male or female of age >18 years) presented to our hospital who were advised minimal invasive procedure (PRP & Corticosteroid Injection) for frozen shoulder. All of these patients had received at least 3 weeks of conservative treatment in any form of bed rest,

medications (NSAIDs, muscle relaxants), heat therapy, physiotherapy exercises and lumbar traction with no benefit. Patients were enrolled based on inclusion criteria and exclusion criteria. All the patients were contacted and only those patients who gave their consent were included in the study. Enrolment began in June 2017. Study subjects were systemically and randomly allocated in two groups of 30 each (Group A and Group B). Two groups of 30 patient each were made. Patient in group 'A' were subjected to autologous platelet rich plasma injection and in group 'B' were subjected to local injection methyl prednisolone. Subjects with Any previous history of trauma or surgery in the concerned shoulder, Rotator cuff syndrome, shoulder impingement syndrome, bursitis, shoulder arthritis, Taking corticosteroid injection for other disease, Any local infection at the site of procedure, Cervical radiculopathy were excluded from the study. Age, gender, occupation, shoulder affected were enquired about. Chief complaint and history of present illness was enquired into. After clinical examination routine blood examination which included complete blood count, random blood sugar, BT, CT, PT, INR was done. Anteroposterior radiograph of involved side (shoulder) was done and ultrasound of involved shoulder to look for increased vascular signal was done. Under complete aseptic condition, 3 ml of the extracted platelet rich plasma was injected into the most tender area around the shoulder with a standard 20-gauge needle via Posterior shoulder approach under ultrasonographic guidance. Immediately after the injection the patient was kept in a supine position for 15 minutes, and then sent home with instructions to limit their use of arm for at least 48 hours and arm sling was provided. Regular follow up was performed at 1 month, 2 month, 6 month and any complications were noted and the data thus obtained was arranged in a tabulated form and analyzed using SPSS software.

Table 1: Sex wise distribution of subjects (n=60)

Sex	Group 1		Group 2		p value
	n	%	n	%	
Female	20	66.7%	14	46.7%	
Male	10	33.3%	16	53.3%	
Total	30	100%	30	100%	0.118

Table 2: Complication Associated with Procedure in PRP

Complications	Frequency	Percentage
None	25	83.33%
Pain	5	16.67%
Total	30	100%

Table 3: Complication Associated with the Procedure in Methyl Prednisolone

Complications	Frequency	Percentage
None	26	86.70%
Local Skin Atrophy	2	6.67%
Pain	2	6.67%
Total	30	100%

RESULTS

Out of 60 subjects evaluated, two groups were made. PRP group (n=30) in which the number of females (n=20) was higher than males (n=10). In steroid group number of males (n=16) was higher than number of females (n=14). The p=0.118 suggests that there was no statistically significant difference of gender between the two groups. (table 1)

Table 2 shows the complication associated with the procedure in PRP. Out of thirty patients, five (16.67%) patients had a minor complication in form of pain at injection site which subsided over one week. There were 25 patients (83.33%) subjects without any complication.

Table 3 shows the complications associated with the procedure in methyl prednisolone group. Only two (6.66%) patients had a minor complication in form of local skin atrophy. There were 2 cases (6.67%) with pain. Rest of the 26 patients (86.70%) had no associated complication.

DISCUSSION

Arthroscopic capsular release is one of the common surgical procedures performed for debilitating patient who are not benefitted from minimal invasive technique. Frozen shoulder is caused by adhesion in the capsule, which creates pain, joint stiffness and limitation in range of motion.⁶ Although using PRP and sometimes methylprednisolone injections for FS could produce good outcomes, some physicians recommend physical therapy.⁷ Adhesive capsulitis is a painful stiff shoulder due to thickening of the capsule & synovium. The main observed changes are hyperkalemia of the synovium and a capsular fibrosis similar to that of Dupuytren's disease. Stiffness involves mainly flexion, lateral rotation and abduction.² In most cases, a spontaneous healing is observed within 12 to 30 months. When the capsulitis is disabling and pain still present, a joint distension followed by rehabilitation can be indicated. When the disability is important and mainly due to stiffness, a manipulation under anesthesia with or without arthroscopic release of soft tissues can be indicated. Painful stiffness of the shoulder is an ill-defined clinical entity that is difficult to assess and delicate to treat.⁸ The nomenclature used is broad and includes terms such as frozen shoulder, adhesive capsulitis, focal algodystrophy, stiff shoulder, contracted shoulder, and others. Apart from its idiopathic form, the disease can be initiated by trauma, infection, tumour, radiation, systemic and local metabolic disturbances.⁶ Patho-anatomically, the common denominator is an inflammatory vascular proliferation followed by thickening, scarring, and retraction of the joint capsule. The inflammatory process often starts at the rotator interval and may extend to the sub-acromial space. Clinical diagnosis is based on history and physical examination. Generally the onset of pain precedes the perception of a reduced range of motion by weeks or months. Aslani et al in 2016⁹ conducted an experimental PRP therapy for frozen shoulder in a volunteer revealed 2 consecutive doses of PRP with an interval of 4 weeks improved functional range of movements and pain relief. He emphasized 2-fold improvement for range of movements with PRP therapy. Kumar et al in 2018 conducted an observational study to compare local steroid injections and ultrasonic wave therapy in frozen shoulder patients revealed immediate improvement of range of movements is better with local steroid injections. They concluded long term effects are same in both the

groups.¹⁰ The results of this study support the use of PRP in frozen shoulder. We found that PRP has positive effects on healing during shoulder capsulitis. This intervention decreases pain and increases upper limb function. Also, it can improve range of shoulder motion in various directions if patient are compliant in long term still a prospective cohort study for a longer duration need to be conducted as the follow up in my study was 6 month's regarding efficacy of PRP.¹¹ No major adverse effect were observed in both the group.

CONCLUSION

In the present study, minimal complication in form of pain at injection site and skin atrophy was noted in PRP & Steroid Group respectively. Both the method were safe with minimal complication in our study in contrast to literature which shows various adverse effects of steroid.

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Source of Support: Nil.

Conflict of Interest: None Declared.

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Cite this article as: Sanjeev Kumar, Piyush Pushkar Singh. Evaluation of Complications Associated with Injection Methyl Prednisolone & PRP for Shoulder Dysfunctions: An Institutional Based Study. *Int J Med Res Prof*. 2019 Sept; 5(5):197-99. DOI:10.21276/ijmrp.2019.5.5.043