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Assessment of effectiveness of intra articular autologous platelet rich plasma injection in the management of adhesive capsulitis of shoulder joint

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Abstract

Background: It was reported that platelet rich plasma injection is effective in the management of pain in adhesive capsulitis. Platelet rich plasma injection has multiple uses in the field of medical sciences.

Objectives: The present study was undertaken to observe the effectiveness of intra articular autologous platelet rich plasma injection in the management of adhesive capsulitis of shoulder joint.

Methods: The present study involved 30 patients within the age group of 30 to 60 years of age were included. Both males (n=12) and females (n=18) were present in the study. DASH score and visual analogue scores were assessed in the patients with 8 weeks follow up. Data was collected pre injection, post injection after four weeks.

Results: There was a significant decrease in the scores of DASH and Visual analogue scale scores followed by the intervention.

Conclusion: The study results demonstrated that the platelet rich plasma injection was very effective in reducing the pain levels of the patients. The study suggests need of further detailed studies in this area to recommend the use of plasma injection rich with platelets for management of adhesive capsulitis.

Keywords: Plasma, adhesive capsulitis, pain

Introduction

Pain management is a challenging task for the physicians till date. Shoulder pain is most common in patients with tendonitis, rotator cuff tear, osteoarthritis, adhesive capsulitis etc. Earlier studies reported that about six percent of the cases of shoulder pain is due to the adhesive capsulitis [1]. It was reported that there are many factors that contributes for increase in the progression of pain in adhesive capsulitis. Hence, assessment of the factors that contributes to disease progression is essential. Further, the disease has to be diagnosed in early phases so that the treatment strategies can be implemented to decrease the severity or to delay progression. However, the accuracy of the available tests for diagnosis of adhesive capsulitis is limited [2]. The most common diagnostic test for the adhesive capsulitis is observing the range of motion of active and passive movements in different planes. It was recommended that at least two planes movement should be tested along with external rotation.

It was reported that platelet rich plasma injection is effective in the management of pain in adhesive capsulitis [3, 4]. Platelet rich plasma injection has multiple uses in the field of medical sciences [5, 6]. It was being used in many surgical procedures like maxilla facial surgery, plastic surgeries and many musculoskeletal procedures [7]. In the management of musculoskeletal diseases the injection should be made directly to the shoulder joint [8]. The injection was explained to release multiple growth factors and increase the healing process [9, 10]. Hence, it is essential to evaluate the effectiveness of the platelet rich plasma injection. The present study was undertaken to observe the effectiveness of intra articular autologous platelet rich plasma injection in the management of adhesive capsulitis of shoulder joint.

Materials and Methods

Study design: Observational study

Sampling method: Convenient sampling

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Study population: The present study involved 30 patients within the age group of 30 to 60 years of age were included. Both males (n=12) and females (n=18) were present in the study. Thorough clinical evaluation was conducted to all the patients. Voluntary informed consent was obtained from all the patients before the study. Willing participants, who are not having any severe complications, were included in the study. Unwilling patients with severe complications were excluded from the study.

Method of data collection: Data was collected using standard methods mentioned in the literature [6]. DASH score and visual analogue scores were assessed in the patients with 8 weeks follow up. Data was collected pre injection, post injection after four weeks.

Ethical consideration: The study proposal was approved by an institutional human ethical committee. Informed consent was obtained from all the participants. Confidentiality of data was maintained.

Data analysis: Data was analyzed using SPSS 20.0 version. Demographic data was presented as frequency and percentage. Student t-test was used to assess the significance of the difference between the groups.

Results

Table 1 presents the demographic data of the participants. Table 2 presents the effectiveness of intra articular autologous platelet rich plasma injection in males. Table 3 presents the effectiveness of intra articular autologous platelet rich plasma injection in females.

The two-tailed P value equals 0.0011 for DASH score in males. By conventional criteria, this difference is considered to be very statistically significant. The mean of Group One minus Group Two equals 15.600. 95% confidence interval of this difference: From 6.966 to 24.234. The two-tailed P value is less than 0.0001 for DASH score in females. By conventional criteria, this difference is considered to be extremely statistically significant. The mean of Group One minus Group Two equals 16.00. 95% confidence interval of this difference: From 9.64 to 22.36. The two-tailed P value equals 0.0001 for VAS scores in males. By conventional criteria, this difference is considered to be extremely statistically significant. The mean of Group One minus Group Two equals 3.00. 95% confidence interval of this difference: From 1.66 to 4.34. The two-tailed P value equals 0.0052 for VAS scores in females. By conventional criteria, this difference is considered to be very statistically significant. The mean of Group One minus Group Two equals 2.00. 95% confidence interval of this difference: From 0.66 to 3.34.

Table 1: Age wise distribution of cases

Age group in years	Number of patients (n=30)	percentage
30-40	12	
41-50	8	
51-60	10	

Data was presented as frequency and percentage

Table 2: Effectiveness of intra articular autologous platelet rich plasma injection in males (n=12)

Technique	Pre injection	Post injection	P value
DASH score	82±3.46	66.4±2.3	0.0011**
VAS score	8±0.58	5±0.29	0.0001***

Data was presented as mean and SEM. (**P<0.01 is significant)

Table 3: Effectiveness of intra articular autologous platelet rich plasma injection in females (n=18)

Technique	Pre injection	Post injection	P value
DASH score	78±2.31	62±2.02	<0.0001***
VAS score	7±0.29	5±0.58	0.0052**

Data was presented as mean and SEM. (**P<0.01 is significant)

Discussion

Adhesive capsulitis is also called as frozen shoulder in common terminology. This condition causes severe pain in the shoulder to the patient. Further the movement of the shoulder is also very much limited. The movements restricted include both active and passive also. The common cause for this condition is thickening of the connective tissue around the shoulder capsule. It may be due to inflammation. Management of pain is the challenging condition in these patients. The frozen shoulder has high importance because of its high morbidity [11-13].

The present study was undertaken to observe the effectiveness of intra articular autologous platelet rich plasma injection in the management of adhesive capsulitis of shoulder joint. There was a significant decrease in the scores of DASH and Visual analogue scale scores followed by the intervention. The study results demonstrated that the platelet rich plasma injection was very effective in reducing the pain levels of the patients.

Platelet rich plasma has multiple uses in the field of medical science. The platelets are autogenously which are mixed with small volume of plasma. It was used in the maxilla facial surgery patients successfully [14, 15]. The platelets has capability to stimulate the release of several growth factors at the site of injury and also capable to reduce the inflammation. Both these qualities will cause decrease in the thickness of the connective tissues. This leads to pain relief to the patient. Earlier studies reported that the platelet rich plasma injection was very useful in the management of frozen shoulder cases [16]. Another study reported that the injection also increases production of collagen along with growth factors that can speed up the healing process [17, 18]. The most important growth factor that is released is vascular endothelial growth factor. The present study agrees with earlier studies as we have observed significant pain relief followed by the injection. However, the results cannot be generalized as the study was conducted in one center. Further, multi centric studies may be needed for further understanding.

Conclusion

The study results demonstrated that the platelet rich plasma injection was very effective in reducing the pain levels of the patients. The study suggests need of further detailed studies in this area to recommend the use of plasma injection rich with platelets for management of adhesive capsulitis.

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