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Original Article

Efficacy of Platelet-Rich Plasma Versus Steroids In Patients of Tennis Elbow

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ABSTRACT

Objective: To compare the efficacy of Platelet Rich Plasma versus Steroids among patients managed for Tennis elbow at our Orthopaedic unit.

Study Design: Quasi-experimental study.

Place and Duration of Study: Orthopaedic Department, Combined Military Hospital, Rawalpindi Pakistan, from Jan 2021 to Jul 2022.

Methodology: Patients with Tennis Elbow diagnosed by a consultant orthopaedic surgeon were included in the study. They were randomly allocated treatment with platelet-rich plasma and steroid injections. The team assessed them after three months of treatment using the Disabilities of Arm, Shoulder, and Hand score. Different factors, including mode of treatment, were associated with significant improvement in these patients at the end of three months.

Results: Out of 250 patients with tennis elbow included in the final analysis, 193(77.2%) were male, and 57(22.3%) were female. Patients were divided into two groups for comparison, and Group-1 had significant improvement, while Group-2 had no improvement. Out of the total, 117(46.8%) patients received platelet-rich plasma, while 133(53.2%) patients were managed with corticosteroids. The presence of comorbid illnesses and the use of platelet-rich plasma was statistically significantly found in a group with significant improvement in Disabilities of Arm, Shoulder, and Hand score (p-value<0.05) as compared to a group of patients without significant improvement.

Conclusion: Most patients had significant improvement in symptoms at the end of three months. In our study, patients who were managed with platelet-rich plasma and had no comorbid illness had more chances of significant improvement at the end of three months.

Keywords: Corticosteroids; Platelet rich plasma; Tennis elbow.

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INTRODUCTION

Diseases of bones, joints and ligaments are commonly seen in general practice, orthopaedics and trauma outpatients.[1] Statistics in Pakistan are similar, and due to general physicians' lack of basic infra-structure, orthopaedic teams bear this burden mainly.[2] Tennis elbow or lateral elbow epicondylitis is a soft tissue injury involving the upper limb in middle-aged men and women.[3] Pain, discomfort, and compromised function of the joints are symptoms usually experienced by these patients, which markedly affect the health-related quality of life.[4]

Treatment options for tennis elbow or lateral elbow epicondylitis vary according to the duration and intensity of symptoms. The availability of pharmacological agents and surgical expertise may also affect the treatment modality. Corticosteroids have been the mainstay of treatment for the last few decades. However, platelet-rich plasma has risen in the last few years.[5] Surgical management is also still in practice, but it is usually for cases that do not respond to medical management.[6]

Various studies and reviews have compared different treatment options for lateral epicondylitis. Li *et al*. analyzed seven randomized controlled trials comparing PRP and corticosteroids for the management of elbow epicondylitis. They concluded that the short-term outcomes were better with steroid injections, but in long-term follow-up, PRP treatment was superior to steroids.[7] Similar analysis was conducted by Xu *et al*. comparing PRP and steroids. They revealed that after six months of follow-up, patients managed with PRP showed better outcomes than those managed with local corticosteroids.[8] A comparative study in India evaluated the efficacy of PRP and triamcinolone for the management of tennis elbow. It was concluded that short-term relief was better with PRP than steroid treatment or normal saline.[9] Heterogenecity results in various parts of the world needing more work on this, especially in the local population.

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Health resources in Pakistan are limited, and clinicians and patients must incorporate cost-effectiveness in decision-making for treatment choices in various conditions. A recent study conducted in Karachi and published in Pakistan Armed Forces Medical Journal concluded that Platelet-rich plasma (PRP) was a better option in terms of controlling pain in patients suffering from tennis elbow.[10] Limited local data has been available regarding the comparison of PRP and corticosteroids in terms of pain and functional outcome among patients suffering from lateral epicondylitis. Therefore, we planned this study to compare the efficacy of platelet-rich plasma versus steroids among patients managed for tennis elbow at our Orthopaedic unit.

METHODOLOGY

The quasi–experimental study was conducted at the Orthopaedic Department of Combined Military Hospital Rawalpindi, Pakistan from January 2021 to July 2022 after obtaining IERB Approval (letter no: 350). The sample size was calculated by the WHO Sample Size Calculator using two groups: Group I had a significant improvement of symptoms (75.2%), Group II had a significant improvement of symptoms (29.1%).[11]

Inclusion Criteria: Patients of either gender over 18 years of age diagnosed with tennis elbow were recruited.

Exclusion Criteria: Patients with any known allergy or serious adverse effects of corticosteroids or PRP, those with any neoplastic bone lesions, which may be primary or secondary, patients with known musculoskeletal or autoimmune disorders, pregnant women or patients taking steroids already for some other ailment were excluded.

Patients were placed in two groups after application of set criteria and informed consent (Figure).

Consultant orthopaedic doctor diagnosed Tennis Elbow based on clinical and radiological findings.[12] One group of patients received the platelet-rich plasma while another group received the injection of Methylprednisolone in standard doses as decided by experts.[13] All the patients were assessed by the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire at baseline and after three months of treatment. The minimal clinically important difference was considered if it was 12 or more after three months of treatment in the allocated group.[14,15]

All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 24:00. Frequency and percentages were calculated for quantitative parameters. Mean and standard deviation for age were also calculated for the study participants. Pearson chi-square test and Fischer exact test by keeping the *p*-value of ≤0.05 as significant, were used to look for factors associated with significant improvement in the DASH score of study participants.

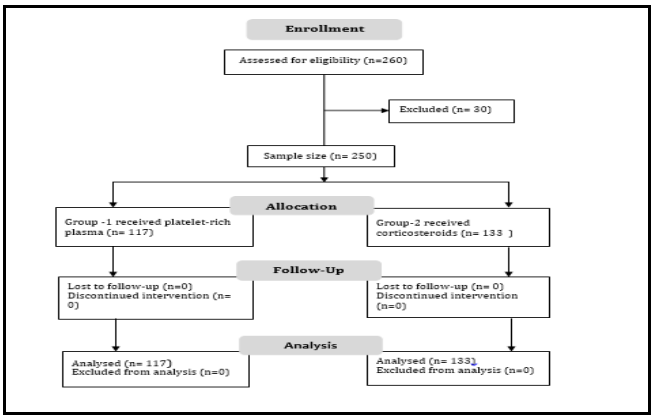


Figure: Patient Flow Diagram (n=250)

RESULTS

Out of 250 patients with tennis elbow included in the final analysis, 193(77.2%) were male, and 57(22.3%) were female (Table-I). The mean age of the patients managed for tennis elbow in our study was 46.66± 12.63 years. 117 (46.8%) patients received platelet-rich plasma while 133(53.2%) patients were managed with corticosteroids. Patients were divided into two groups; Group-A with significant improvement had 161(64.4%) patients while Group-B without significant improvement had 89(35.6%) patients. Out of the total patients, 19(7.6%) had Diabetes Mellitus, while 13 (5.2%) had hypertension. Table-II shows the results of data processing for the study. Patients were divided into two groups for the sake of comparison. Group-A had patients with significant improvement, while Group-B had patients without significant improvement. The statistical tests revealed that the absence of comorbid illnesses (*p*-value<0.001) and the use of platelet-rich plasma (*p*-value<0.001) were statisti-cally significantly found more in patients who had significant improvement in DASH scores as compared to those who did not have significant improvement among the patients managed for tennis elbow.

Table-I: Characteristics Of Patients Managed For Tennis Elbow (n=250)

Study Parameters	n(%)
Age (years)	
Mean±SD	46.66±12.63 years
Range (min-max)	21 years - 65 years
Gender	
Male	193(77.2%)
Female	57(22.8%)
Type of treatment	
Platelet rich plasma	117(46.8%)
Corticosteroids	133(53.2%)
Significant Improvement on DASH Score	
No	89(35.6%)
Yes	161(64.4%)
Comorbid illnesses	
Diabetes mellitus	19(7.6%)
Hypertension	13(5.2%)
Gout	04(1.6%)
Ischemic Heart Disease	09(3.6%)
Others	3(1.2%)

regard, new modalities have been used, and PRP is gaining popularity among patients and treating teams. We conducted this study to compare the efficacy of platelet-rich plasma versus steroids among patients managed for tennis elbow at our Orthopedic unit.

A study published in India included patients with resistant tennis elbow who used steroids with lignocaine. 16 The study revealed that the combination of lignocaine with corticosteroids was superior to steroids alone and effectively reduced the symptoms. Our study was slightly different. We compared PRP with corticosteroids and found that PRP was a better option for these patients than steroids at the end of three months of treatment.

The effectiveness of platelet-rich plasma (PRP), autologous blood (AB), and corticosteroid injections in patients with lateral epicondylitis were compared by Tang *et al*. They concluded that short-term relief was better with corticosteroids, but long-term results were better in patients who were managed with PRP.[17] We

Table-II: Association of Various Factors with Significant Improvement on DASH Score Among Patients of Tennis Elbow (n=250)

Factors	Significant Improvement n=161	No Significant Improvement n=89	*p*-value
Age			
<50 years	96(37.2%)	43(48.3%)	0.085
>50 years	65(62.8%)	46(51.7%)	
Gender			
Male	122(75.7%)	71(79.7%)	0.468
Female	39(24.3%)	18(20.3%)	
Presence of Comorbid Illnesses			
No illness	143(88.8%)	59(66.2%)	<0.001
Diabetes mellitus	02(1.2%)	17(27.8%)	
Hypertension	03(1.8%)	10(16.4%)	
Gout	02(1.2%)	02(3.2%)	
Ischemic heart disease	09(5.5%)	00 (0%)	
Others	02(1.2%)	01(1.6%)	
Type of Treatment			
Platelet rich plasma	95(59.1%)	22(24.7%)	<0.001
Corticosteroids	66(40.9%)	67(75.3%)	

DISCUSSION

Platelet Rich Plasma was a better treatment option for tennis elbow patients compared to cortico-steroids. Tennis elbow is a common clinical condition that affects primarily middle-aged individuals. Pain and disability associated with this condition usually affect the overall quality of life of an individual.Timely diagnosis and treatment help patients reduce pain and disability. General physicians usually prescribe painkillers before the patient reports to a concerned specialist. Steroids have been used for a long to manage this condition with acceptable results. In this compared the findings via DASH score at the end of three months of treatment and found out that most patients had significant improvement in symptoms at the end of three months. Patients who were managed with platelet-rich platelet-rich plasma and had no comorbid medical illness had more chances of significant improvement in our study at the end of three months. Gupta *et al*. found out that at six weeks' steroids showed better results, but at the end of three and six months, PRP turned out to be a better treatment option. We did not study at six weeks or six months, but at the end of three months, patients who

were managed with PRP showed more improvement than those who were managed with corticosteroids.[18]

Gosens *et al*. published a double-blind, randomized controlled trial with a 2-year follow-up regarding PRP versus Corticosteroids in patients suffering from lateral epicondylitis.[19] It was revealed that even after a two-year long-term follow-up, patients managed with PRP showed better results than patients managed with corticosteroids. Our results were similar at the end of three months of treatment.

LIMITATIONS OF STUDY

Improvement in disability and pain depends on several socio-demographic and clinical factors, including the patient's personality. Strict control of confounding factors may reveal the exact efficacy of both forms of treatment included in the study.

CONCLUSION

Most patients had significant improvement in symptoms at the end of three months. In our study, patients managed with platelet-rich plasma and with no comorbid medical illness had more chances of significant improvement at the end of three months.

Conflict of Interest: None.

Authors Contribution

Following authors have made substantial contributions to the manuscript as under:

MNI & MSA,: Conception, study design, drafting the manuscript, approval of the final version to be published.

MOR & JIN: Data acquisition, data analysis, critical review, approval of the final version to be published.

AR & SH: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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