A Retrospective Study of Comparison of Local Injection of Platelet Rich Plasma and Corticosteroids in the Treatment of Lateral Epicondylitis of Humerus

Dr. Jishnu., Dr. Mahesh Kumar N, Dr. Arun H. S
Senior Resident, Assistant Professor, Professor
Department Of Orthopaedics, Roju, SDUMC, Kolar

*Corresponding Author: Dr. Jishnu
Senior Resident, Department of Orthopaedics, Roju, SDUMC, Kolar

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ABSTRACT

INTRODUCTION

Lateral epicondylitis, commonly known as Tennis Elbow is one of the most common causes of musculoskeletal pain involving common extensor origin of the forearm. The disorder arises as a result of repetitive manual work involving overexertion of wrist and finger extensors and imparts significant disability in terms of quality of daily life activities. Clinically it reveals both direct and indirect tenderness at the lateral epicondyle [1]. Although the diagnosis of lateral epicondylitis is quite straightforward, there has been no consensus on the optimal management strategy [2]. Local steroid injection has been proven to provide consistent and predictable short term pain relief [3]. New treatment options include local injection of Platelet Rich Plasma (PRP), autologous blood, prolotherapy and extracorporeal shockwave therapy [4-8]. Platelet rich plasma is a concentrate of platelets derived from the patient’s own blood. Platelets in PRP contain growth factors and build up reparative processes. The action of PRP therapy in chronic tendinopathies is varied and hypothesized to include angiogenesis, increase in growth factor expression and cell proliferation, increase the recruitment of repair cells and tensile strength [3]. Lateral epicondylitis may be characterized by complex changes in the tendon in addition to an inflammatory process. Therefore, PRP owing to its high content of various growth factors may be more efficacious as a healing agent. However, studies on lateral epicondylitis with PRP treatment have yielded inconclusive results. So we want to conduct study with an aim to explore the efficacy of PRP and STEROID in patients of tennis elbow.

AIMS AND OBJECTIVES OF THE STUDY

The main objective of the study was to compare the efficacy of local injection of platelet rich plasma versus corticosteroids in terms of pain relief and functional improvement.

MATERIALS AND METHODS:

About 50 patients with TENNIS ELBOW were diagnosed clinically in RLJ HOSPITAL, divided into two groups

Group A patients received a single injection of PRP (1ml), with absolute platelet count of 1 million platelets/ mm3 as confirmed by manual counting. PRP was injected into the common extensor origin at the lateral epicondyle of the humerus under aseptic conditions. PRP was prepared under aseptic
conditions as per the procedure standardized in the departmental laboratory. Group B patients received a single injection of corticosteroid (triamcinolone, 40mg in 1ml).

The site of injection and the technique used was same in both the groups.

Parameters measured Pain intensity: This was assessed using the Visual Analog Scale (VAS), a subjective assessment scale of perceived pain. VAS uses a numerical scale ranging from 0 to 10, where 0 indicates no pain and 10 indicates maximum possible pain. Assessment was done before and after the assessment of grip strength in all the four assessment sessions.

Functional outcome: Functional outcome was measured using quick Disabilities of the Arm, Shoulder and Hand scale (qDASH) at baseline and in all three follow up visits. The qDASH is a shortened version of the DASH Outcome Measure. Instead of 30 items, the qDASH uses 11 items to measure physical function and symptoms in persons with any or multiple musculoskeletal disorders of the upper limb. Any adverse effect reported by the patients was also recorded.

Inclusion criteria:
1. Clinically tennis elbow cases age 18-50.

Results
Out of the 60 patients recruited for the study, sixty completed 1 months follow up, 30 in each group. Group A patients received PRP local injection and Group B patients received methyl-prednisolone local injection. Most of the patients were between the age of 30 to 39 years. The mean age, gender distribution, laterality and mean duration of symptoms were comparable in patients of Groups A and B are shown in below table.

<table>
<thead>
<tr>
<th>Characteristics’</th>
<th>Group A</th>
<th>Group B</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>37.4</td>
<td>37.1</td>
<td>0.6435</td>
</tr>
<tr>
<td>Gender (m/f)</td>
<td>10/20</td>
<td>7/23</td>
<td>0.346</td>
</tr>
<tr>
<td>Side(R/f)</td>
<td>21/9</td>
<td>22/8</td>
<td>0.112</td>
</tr>
<tr>
<td>Mean duration of symptoms</td>
<td>2.26</td>
<td>1.93</td>
<td>0.236</td>
</tr>
</tbody>
</table>

Pain- Pain was assessed using the VAS. The subjective pain report or the VAS score improved more with corticosteroid injection after 15 days (p<0.0001) and one month (p<0.018), however, at the end of three months improvement in pain was significantly better in PRP injection group (p<0.0001)

Functional outcome- Functional outcome was measured using q-DASH scale. Gradual improvement of q-DASH score was observed in both the groups. This improvement was statistically significant in all the follow up visits in the both the groups. As in case of the other two parameters functional outcome measure (qDASH) also showed better improvement (p<0.001) in Group A patients at the end of one month. Statistically significant improvement (p < 0.05) was noted in each parameter at 15 days, 1 month follow up from baseline values in both the groups. When the groups were compared with each other, group B had statistically significant (p<0.05) and better improvement than Group A at 15 days and follow up period while at 1 month follow up group A had better improvement on each parameter over Group B (p< 0.05). None of the patients reported any adverse effects.

<table>
<thead>
<tr>
<th>Groups</th>
<th>q DASH mean on 0 day</th>
<th>P value</th>
<th>q DASH mean on 15 days</th>
<th>P value</th>
<th>Q DASH mean</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>88</td>
<td>0.6055</td>
<td>75.5</td>
<td>&lt;0.0001</td>
<td>62.5</td>
<td>0.0094</td>
</tr>
</tbody>
</table>
DISCUSSION

Lateral epicondylitis is a common problem with many available treatment options. Lateral epicondylitis also known as Tennis elbow, remains one of the most perplexing disorders of musculoskeletal system. Tennis elbow is thought to result from overuse or repetitive micro-trauma resulting in a primary tendonosis of extensor carpi radialis brevis (ECRB) muscle with or without involvement of extensor digitorum communis (EDC) and extensor carpi radialis longus (ECRL). Some studies have reported female preponderance. The most commonly recommended treatment is rest, physiotherapy, and bracing. Approximately, 87% patients benefit from this combination of treatment methods.

Some studies have reported female preponderance [10,11]. However, Shiri R et al., found 1.3% prevalence of lateral epicondylitis without any gender difference [12]. The findings of our study also support a female preponderance. Chard MD and Hazelman BL stated that lateral epicondylitis involves dominant arm more frequently and occurs equally among all socioeconomic classes [13]. Similar findings are reflected from the results of our study.

Smidt et al. in their randomized control trial compared corticosteroid injection, physiotherapy, and wait and see policy for the treatment of lateral epicondylitis and concluded that corticosteroid injections are the best treatment option only for the short-term outcome. Treatment with steroids has a significant rate of relapse also, probably because of permanent structural changes in the tendon caused by the steroid.

In a systematic review, Assendelft et al. to assess the effectiveness of corticosteroid injections for lateral epicondylitis found that steroid injection appears to be safe and seem to be effective in short-term only and also realized that the issues of optimal timing, dosage, injection technique, and injection volume remain unanswered.[10]

Various types of surgical procedures are also available for patients with chronic lateral epicondylitis. Veerhar et al. noted an improvement in 60%–70% of the patients after surgical treatment (lateral release of the common extensor origin).[3,13] Patients however are seldom interested in operative procedures for this and seek an alternative.

PRP is an autologous blood-derived product which has been used in humans for its healing properties attributed to the increased concentrations of autologous growth factors and secretory proteins that may enhance the healing process on a cellular level. PRP contains a 3–5-fold increase in growth factors concentration and is associated with enhancement of healing process.[11]

PRP has been demonstrated as a potent agent for tissue healing in chronic wounds, tendinitis, and even bone. A possible explanation for the long-lasting effect of PRP in chronic tendinopathy is that it promotes revascularization and enhances healing at the microscopic level,[2,3]

Edwards and Calandrucio injected whole blood into patients with lateral epicondylitis and saw a success rate of 79%; however, multiple injections were necessary in 32% of patients. They attributed their result to the fact that autologous blood provides necessary cellular and humoral mediators to induce healing cascade.19

A recent double-blind randomized control study by Aziza Sayed Omar, et al., has reported that effect of corticosteroid injections lasts for about one month while that of PRP injections last for more than 6 months in providing pain relief in tennis elbow and plantar fasciitis.[9]

Our findings of significant improvement in both groups at 15 days . While significantly more improvement in all outcome measures in PRP group at 1month follow up are consistent with the work of Gosens T et al., and Kamezi et al., . It is possible that PRP offers a long term healing effect on the affected tendon. The disparity in the efficacy of PRP in some studies may be attributed to the relative difference in the quantity of growth factors delivered to the degenerated tendon.[20]

Conclusion:

The results revealed that the long term efficacy of PRP treatment is better. Therefore, we concluded PRP as a superior treatment option in cases of tennis elbow. However, keeping in view the limited period of follow up in the present study we recommend
longer follow up studies to further consolidate our findings and establish the long term efficacy of PRP in cases of lateral epicondylitis.

References:


