



International Journal of Orthopaedics Sciences

E-ISSN: 2395-1958
P-ISSN: 2706-6630
IJOS 2021; 7(4): 323-325
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www.orthopaper.com
Received: 15-08-2021
Accepted: 17-09-2021

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Management of lateral epicondylitis elbow treated with corticosteroid versus platelet rich plasma injection at a tertiary care centre: A comparative study of the functional outcome

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DOI: <https://doi.org/10.22271/ortho.2021.v7.i4e.2901>

Abstract

The aim of the present study is to compare the clinical and functional outcome in the patients with Lateral Epicondylitis elbow treated with local Corticosteroid injection vs Platelet Rich Plasma. A total of 74 patients were included in the study, divided into two groups equally. One group comprising of 37 patients with a mean age of 34 years was managed with intralesional autologous platelet rich plasma (PRP) injection and the other 37 patients with mean age of 37.20 years were treated with intralesional injection of 2ml Triamcinolone 40mg diluted with 2ml of 0.5% Bupivacaine. The results were calculated on the basis of the pre and post treatment VAS Score, DASH score and MAYO Elbow Performance score evaluated on 3 occasions post treatment, at 3 months, 6 months and finally at 12 months follow up. This study concludes that PRP injection gives slightly better functional outcome as compared to Corticosteroid injection however pain relief is comparatively similar with the two treatment procedures. A bigger sample size will be required to conclude a significant difference in the outcome of the two methods of management of lateral epicondylitis.

Keywords: corticosteroid, lateral epicondylitis, platelet rich plasma (PRP)

Introduction

Lateral Epicondylitis or Tennis Elbow is characterized with pain and tenderness over the common extensor origin i.e. the origin of the muscles of the extensor compartment of the forearm^[1, 2]. It affects roughly more than 1% of the total population with slight predominance in females over males^[3]. It is commonly seen in the age group of 35-50 years, and amongst people who have a history of repeated and vigorous activities involving extension at the elbow joint like sportsmen, laborers etc^[4, 5]. Despite the presence of inflammatory cells locally, the pathophysiology of lateral epicondylitis is not clearly known and a strong argument that lateral epicondylitis can be regarded as a degenerative disease which is caused by overuse, tendonitis and micro-trauma leading to tear of the Extensor Carpi Radialis Brevis tendon^[6]. Treatment options include immobilization, NSAIDs, physiotherapy, ultrasound therapy, extracorporeal shockwave therapy, Botox injection, corticosteroid injections. Recurrent cases necessitate surgical release^[7]. Corticosteroids mainly aim towards reducing the inflammation but its long term effect over reducing the disease's degenerative changes is questionable^[8]. Platelet Rich Plasma (PRP) delivers high concentrations of alpha-granules containing biologically active moieties like VEG-F (vascular endothelial growth factors) and TGF- β (Transforming growth factor- β) to the areas of soft tissue damage, enhancing local healing^[9]. PRP injection for Lateral Epicondylitis reduces pain and induces healing of the common extensor tendon injury and vascularization of the diseased tendon^[10]. This retrospective study is to compare the outcomes of Corticosteroid injection vs Platelet Rich Plasma injection in patients with Lateral Epicondylitis.

Materials and Methods: This study is a retrospective analysis of a prospectively collected data on all the patients with age more than 18 years diagnosed with lateral epicondylitis who failed conservative line of management for over a period of 3 months between January 2019 to June 2019 were included in the study after an elaborated informed written consent.

Patients with adjuvant comorbidities like cervical radiculopathy or carpal tunnel syndrome, patients with a past history of corticosteroid or PRP injection or Elbow fracture or surgery and patients with history of allergy to corticosteroids or patients on antiplatelet therapy were excluded from the study. A total of 74 patients were randomly divided into two groups. The patients belonging to the first group were administered 4ml of autologous PRP extracted from 25ml blood collected from the patients themselves via a 22-gauge needle connected to a 5cc syringe. The other group of patients were treated with administration of 2ml Triamcinolone 40mg diluted in 2ml of 0.5% Bupivacaine via a 22-gauge needle connected to a 5cc syringe injected at the point of maximum tenderness on palpation over the lateral epicondyle of the humerus. A small patch dressing with a single gauze piece was applied and ice fomentation was promoted at the injection site. The patients were evaluated on the basis of VAS score, DASH score and MAYO Elbow Performance score pre procedure and after 3 months, 6 months and 12 months after the treatment.

Results: The study included 74 patients equally divided into two groups of 37 patients each with the first group consisting of patients with mean age of 34 years and the other group of 37 patients with mean age of 37.20 years. A total of 29 males and 45 females were included in the study and they were randomly divided into the two study groups.

Bar graphs of the pre procedure and 12 months follow up post procedure VAS score, DASH score and MAYO Elbow performance score have been plotted comparing the outcomes in the patients of the two groups.

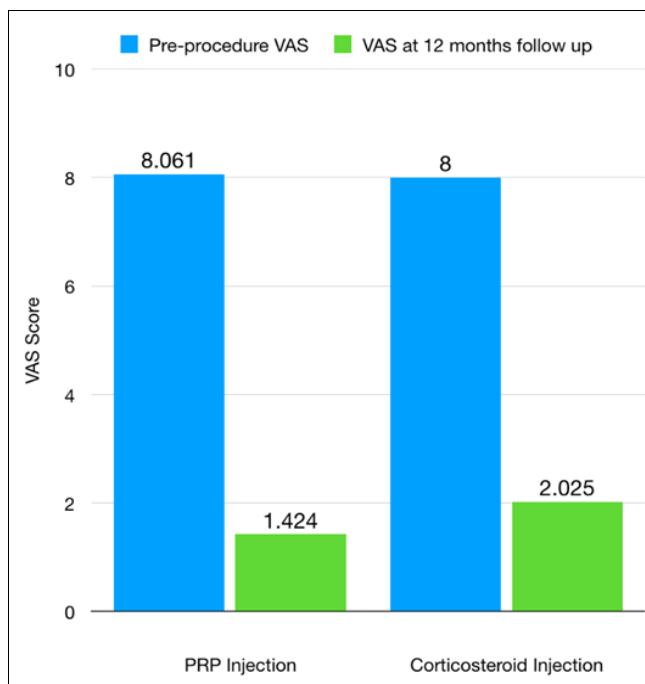


Fig 1: Comparison of VAS score in patients before and after local injection of PRP vs Corticosteroid

The patients of the first group had an average VAS score of 8.061 prior to administration of intralesional PRP injection, which on 12 months follow up improved to 1.424. The patients of the second group had an average pre procedure VAS Score of 8 which improved to 2.025 12 months after intralesional corticosteroid administration.

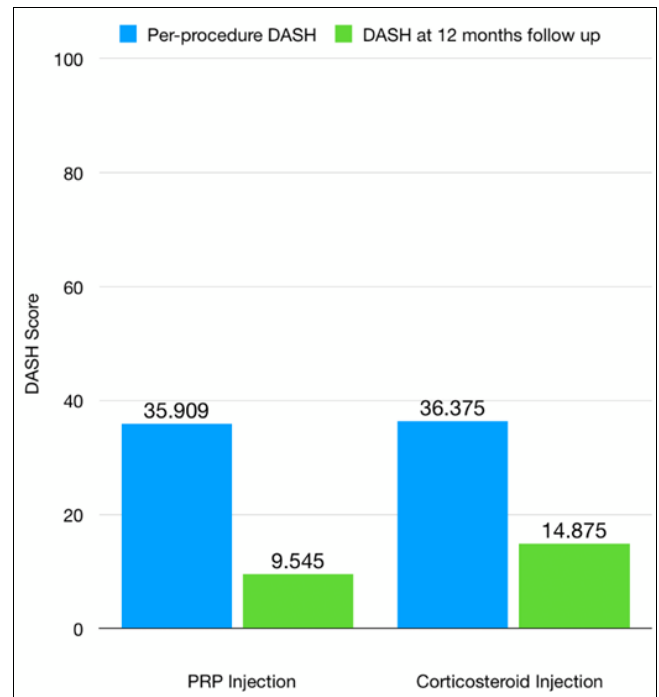


Fig 2: Comparison of DASH score in patients before and after local injection of PRP vs Corticosteroid

The average pre procedure DASH Score of the patients belonging to the first group was calculated to be 35.909 which improved to 9.545 at 12 months post intralesional PRP Injection. Whereas the average pre procedure DASH score in the patients of the second group was calculated to be 36.375 which after administration of intralesional corticosteroid improved to 14.875 after 12 months.

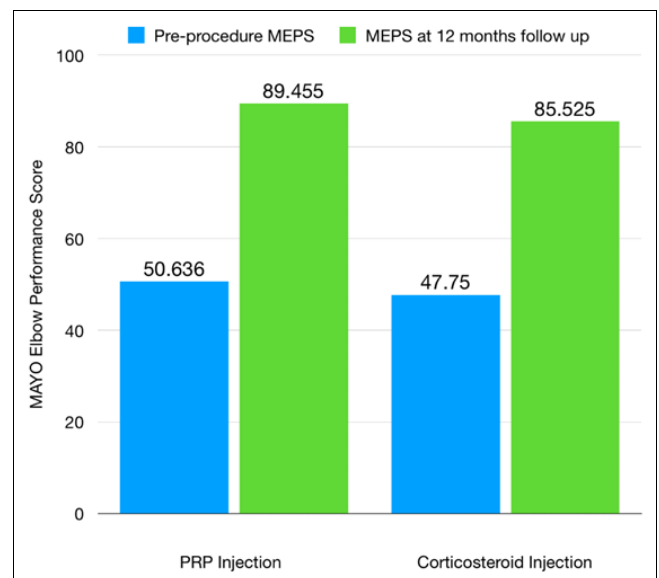


Fig 3: Comparison of MAYO Elbow Performance score in patients before and after local injection of PRP vs Corticosteroid

The average MAYO Elbow Performance score prior to the procedure in the patients of the first group was calculated to be 50.636 which improved to 90.061 12 months after PRP injection, on the other hand, on evaluation of the patients of the second group, the average MAYO Elbow Performance score was 47.75 which improved to 85.525 on evaluation 12 months post intralesional corticosteroids.

From the first group, 2 patients showed no signs of relief after the procedure, while there were no relapses recorded amongst the patients relieved of their symptoms after the PRP injection. While in the second group, 4 patients showed no signs of relief after the procedure while 3 patients followed up in the OPD with a relapse of symptoms at around 3 months after administration of intralesional Triamcinolone 40mg

Discussion: The present study showed that local corticosteroid injection yielded a lower DASH score than PRP treatment during the short-term follow-up period (3 months). Otherwise, it was noteworthy that significantly lower VAS and DASH scores existed for the PRP regimen than for the steroid treatment at the 6 months follow-up. Regarding the MAYO elbow index, no significant difference was established between the two arms during the first 6 months follow-up period, however at 12 months the patients managed with local PRP injections performed better than those treated with local corticosteroids. Local corticosteroid injection used to be the gold standard for the management of epicondylitis. However, it was reported that it had only a short-term effect (2-3 months) after which the patients of the second group started experiencing mild increase in pain. As an alternative treatment, several studies have shown that PRP injection had a long term effect ^[11]. In fact, the results of this study support the above findings.

Lateral epicondylitis was initially believed to be an inflammatory process, but in 1979, it was described as the disorganization of normal collagen architecture by invading immature fibroblasts in association with an immature vascular reparative response. As a means of growth factor delivery, PRP has been used in maxillofacial and plastic surgery since the 1990s. The proposed release of growth factors, including interleukin-1b (IL-1b), epithelial growth factor (EGF), platelet-derived growth factor (PDGF), transforming growth factor-b (TGF-b), and vascular-endothelial growth factor (VEGF), could stimulate tenocyte proliferation and differentiation. It has been suggested that the anti-inflammatory effect of corticosteroids is exerted by suppressing or dispersing the granulomatous response in traumatized tissue. Many studies noted short-term gains after steroid injection, with acute improvement in pain scores over the first 6 weeks. When comparing corticosteroid injections with PRP injections, the results favoured PRP injections at long-term follow-up. Based on this evidence, corticosteroids may aid in acute pain relief but not in the long-term treatment of lateral epicondylitis. There is no general consensus on follow-up time points and the unavoidably arbitrary VAS, DASH scale and MESS score endpoints used to define "success" in pain reduction and functional improvement, resulting in great heterogeneity among the studies. Regarding PRP injection, standardized preparation, optimal quantity, indications and injection time were originally controversial. More substantiated clinical data about PRP are needed. Consequently, caution should be taken when the estimates obtained from this study are interpreted.

Conclusion

Despite being limited by many factors, our study showed that corticosteroid and PRP both have significant therapeutic effect in the treatment of lateral epicondylitis, however PRP has been proven superior to corticosteroid in terms of long-term pain relief and lower relapse rates.

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