

Comparison of effect of platelet rich plasma and corticosteroid for the treatment of tennis elbow

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Abstract

Lateral epicondylitis, is a common problem encountered in the orthopaedic practice. It is a common practice to give local corticosteroid infiltration for tennis elbow. Beneficial effects of local corticosteroid infiltration have sound lack of scientific rationale, since surgical specimens show lack of any inflammatory process. Recently an injection of "Platelet Rich Plasma Injection" has been reported to be effective for both intermediate and long term outcomes for the treatment of lateral epicondylitis. The objective of the study is to evaluate the efficacy and role of Platelet Rich Plasma Injection versus local corticosteroid injection in the management of lateral epicondylitis of humerus.

Keywords: Epicondylitis, orthopaedic, corticosteroid, tennis elbow, inflammatory, Platelet Rich Plasma Injection.

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INTRODUCTION

Lateral epicondylitis, is a common problem encountered in the orthopaedic practice. It is a common practice to give local corticosteroid infiltration for tennis elbow. Histopathological reports have shown that lateral epicondylitis is not an inflammatory process but a degenerative condition termed 'tendinosis'. Beneficial effects of local corticosteroid infiltration have sound lack of scientific rationale, since surgical specimens show lack of any inflammatory process. In recent studies no statistically significant or clinically relevant results in favor of corticosteroid injections were found. Recently an injection of "Platelet Rich Plasma Injection" has been reported to be effective for both intermediate and long term outcomes for the treatment of lateral epicondylitis. It is hypothesized that PRP contains platelet derived growth factor induce fibroblastic mitosis and Chemotactic

polypeptides such as transforming growth factor cause fibroblasts to migrate and specialize and have been found to induce healing cascade.

MATERIALS AND METHODS

A prospective, randomized study was done in Jawahar Lal Nehru Medical College and Hospital, Ajmer from August 1st 2012–May 30th 2013. 50 patients were included in the study. 25 Cases were injected with intralesional Platelet Rich Plasma Injection and 25 cases were injected with local Corticosteroid injection at lateral epicondyle. Outcome was measured using 'Visual Analogue Scale' and 'MMCPI' for elbow.^{1,2} Mann-Whitney U test (non parametric test), 't'-test and Chi-square test are applied to calculate the significance of results.

RESULTS

Follow-up done for total 6 months divided in to intervals at 4week, 8 week and 6 month. At 4th week the corticosteroid injection group showed a statistically significant decrease in pain compared to Platelet Rich Plasma Injection group. At 8th week and 6 months follow up Platelet Rich Plasma Injection group showed statistically significant decrease in pain compared to corticosteroid injection group. At the end of 6 months 44% patients in Corticosteroid injection group and 88% patients in Platelet Rich Plasma Injection group were completely relieved of pain. In Corticosteroid injection

group till 4 weeks there was significant improvement with 64% of patients completely relieved of pain. Many of these patients reported recurrences at 8 weeks and 6 month follow up. The rate of recurrence was 37.5% at the end of 6 months. In Platelet Rich Plasma Injection group at 4th week follow up, 20% of patients were completely free of pain. At the end of 6 months follow up, 88% of patients were completely free of pain. There was no recurrence.

DISCUSSION

Tennis Elbow is a common problem encountered in orthopedic practice and general Practice. Majority of the treatment modalities used for its management lack scientific rationale.³ The role of local steroid is debatable. Recently an injection of Platelet Rich Plasma has been reported to be effective for both intermediate and long term outcomes for the treatment of lateral epicondylitis. There was a significant decrease in pain.^{4,1} It is hypothesized that mitogens such as platelet derived growth factor induce fibroblastic mitosis and chemotactic polypeptides such as transforming growth factor cause fibroblasts to migrate and specialize and have been found to cause angiogenesis. A specific humoral mediator may promote the healing cascade in the treatment of tendinosis as well. These growth factors trigger stem cell recruitment, increase local vascularity and directly stimulate the production of collagen by tendon sheath fibroblasts.⁵ In this current study, the mean age encountered was 42.7 years (Range: 17 to 67 years); the peak incidence was seen from 35 to 50 years. This was seen similar in two separate studies which observed mean age of 45 and 43 years.⁶ Another study observed the mean age to be 46.5 years. In this current study, out of the 50 participants, 21 (42%) were male patients and 29 (58%) were female patients. Two other studies had more number of male patients.⁶ One more study had equal number of males and female patients. Contrary to other studies more number of female patients in this current study may be due to that, females at this study area were more involved with household work which causes repetitive stress at the extensor carpi radialis brevis origin causing micro trauma, a relevant etiology for the initiation of the disease. In this current study, out of the 50 participants, 36 (72%) participants had their right side elbow affected and 14 (28%) had their left side affected. Out of the 50 participants, 40 (80%) participants had their Dominant elbow affected and 10(20%) had their Nondominant elbow affected. In other two studies, one had 84% of the patients with their dominant elbow affected, while in another 78.6% of the patients with their dominant side affected.⁷ Parameters like age, sex, side of elbow involved, dominance of upper limb involved, duration of

symptom and type of occupation of the patients were comparable. The mean VAS score and MMCPI before injection in both the groups were comparable. Mean VAS score for steroid injection group was 74.8, mean VAS score for Platelet Rich Plasma Injection group was 78, P value was 0.27572; mean MMCPI for steroid injection group was 53, mean MMCPI for Platelet Rich Plasma Injection group was 50.2, P value was 0.31732. Till 4 weeks follow up, statistically significant difference between the two groups with VAS scoring and MMCPI was seen. Corticosteroid injection group showed statistically significant decrease in VAS score and increase in MMCPI at 4th week compared to Platelet Rich Plasma Injection group. One study showed similar results with local corticosteroid injection group, when compared with oral naproxen.⁸ At 8th week and at 6 month follow up Platelet Rich Plasma Injection group showed statistically significant decrease in VAS score and increase in MMCPI compared to corticosteroid group. At 6 months follow up, mean VAS score for steroid injection group was 20, mean VAS score for Platelet Rich Plasma Injection group was 6.4, P value was 0.01208; mean MMCPI for steroid injection group was 89.2, mean MMCPI for Platelet Rich Plasma Injection group was 96.2, P value was 0.01314. At the end of 6 months 44% patients in corticosteroid injection group and 88% patients in Platelet Rich Plasma Injection group were completely relieved of pain. This was highly statistically significant with a P value of 0.002836. One study reported that 22/28 patients (79%) responded to Autologous Blood Injections with average Nirschl Scores decreasing from 6.5 to 2.0 with a mean follow up of 9.5 months. In Corticosteroid injection group till 4 weeks there was significant improvement with 64% of patients completely relieved of pain. Many of these patients reported recurrences at 8 weeks and 6 month follow up. The rate of recurrence was 37.5% in corticosteroid injection group. Similar recurrence rate was seen in one study where 14% patients worsened in their symptoms with corticosteroid injection.⁸ In Platelet Rich Plasma Injection group at 4th week follow up, 20% of patients were completely free of pain. At the end of 6 months there was no recurrence. Maximum benefit reached at an average of 5.24 weeks in corticosteroid injection group. Maximum benefit reached at an average of 8.92 weeks in Platelet Rich Plasma Injection group. This was statistically significant with a P value of 0.00116. This study cannot prove conclusively whether the blood itself induced an inflammatory cascade or whether the injury created by the injection was responsible. It is theorized that the beneficial effects of steroid injection result from the bleeding caused by forcing fluid through tissue planes at high pressures. It was seen that there was a significant

increase in post intervention pain for few days in Platelet Rich Plasma Injection group. In corticosteroid injection group 7 participants (28%) patients complained of post-intervention exacerbation of pain while in Platelet Rich Plasma injection group 15 participants (60%) complained of increase of pain after local injection. This was statistically significant with a p value of 0.022654. In this current study it was seen that in PRP group, mean platelet concentration in whole blood was about $263.48 \times 10^3/\mu\text{l}$ and mean platelet concentration in PRP was about $1320.84 \times 10^3/\mu\text{l}$. Another study had shown that clinical efficacy can be expected with a minimum increase in platelet concentration of 4- to 6-fold from whole blood baseline (1 million platelets/ μl). By our method we achieved average 5 fold increase in platelet concentration over baseline platelet count. And these patients had to be managed with oral analgesics for varying period of days (2 to 7 days) for pain relief.

CONCLUSION

Platelet Rich Plasma Injection was beneficial both in short term and long term for the treatment of lateral epicondylitis. Advantages of Platelet Rich Plasma Injection are-highly acceptable, efficacious, economic, easy to carry out as outpatient procedure, devoid of potential complications such as hypoglycemia, skin atrophy, tendon tears associated with corticosteroid injection and low recurrence rate. Clinical findings such as those presented should be correlated with histologic specimens showing evidence of healing such as organization of collagen bundles and return to normal cellular activity after injections of Platelet Rich Plasma into areas of tendinosis. The subject bias inherent in the design of our study was unavoidable because it was difficult to blind either patient or investigator in regard to drawing autologous blood and injecting Platelet Rich Plasma. Furthermore most patients were reluctant to

donate blood that may be discarded and not used for their benefit. Nonetheless this study offers encouraging results of an alternative treatment that addresses the pathophysiology of lateral epicondylitis that had failed traditional nonsurgical modalities. Further clinical studies may prompt other investigators to further define substances that may enhance tendon healing for lateral epicondylitis and other disabling tendinoses.

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