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Original Research Paper

Orthopaedics

EFFICACY OF PLATELET RICH PLASMA IN RELIEVING PAIN AND IMPROVING FUNCTION IN TENNIS ELBOW

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ABSTRACT

Platelet rich plasma (PRP) which is an autologus blood derived product, has in recent years emerged as a safe and cost effective alternative to local injections of steroids in patients suffering from tennis elbow. This study was undertaken to evaluate its efficacy and safety in these patients.74 patients were included in this study. Relief from pain and functional improvement were evaluated using VAS DASH and PRTEE scores, before the procedure and at 6 weeks, 12 weeks and 24 weeks after the procedure. In our study, patients showed statistically significant improvement across all three measures of outcome. Mean value of VAS scores were 79.7 at 0 weeks, 37.2at 6 weeks (p value .0036) , 30.07 at 12 weeks(p value .001) and 28.8 at 24 weeks(p value .0014). Mean value of DASH improved from 69.2 at 0 weeks to37.4 at 6 weeks (p value .0018), 32.3 at 12 weeks (p value .001) and 31.7 at 24 weeks (p value .001). Patients also showed improvement in terms of PRTEE scores when it decreased from 51.3 at 0 weeks to23.5 at 6 weeks (p value .0034) to16.7 at 12 weeks (p value .004) and 15.3 at 24 weeks (p value .002).

Based on these findings we can conclude that PRP when appropriately given provides significant relief from pain and functional improvement when injected locally in patients of tennis elbow. However further studies with larger number of patients and follow up of longer duration are required to further establish its long term efficacy

KEYWORDS : platelet rich plasma, tennis elbow

INTRODUCTION

Lateral epicondylitis, commonly known as tennis elbow is a very painful and disabling condition in which pain at the site of origin of extensor muscles of forearm at lateral epicondyle is caused due to repetitive and abnormal stresses. It causes significant morbidity and loss of work hours. Conservative treatment options which range from rest to the specific part, use of non steroidal anti inflammatory agents, to injection of steroids at the site, frequently fail and also may lead to serious side effects. In recent years significant research has been done in the role of platelet rich plasma (PRP)(1), which is an autologus product derived from blood, in various orthopaedic conditions including tendinopathies like tennis elbow(2,3,4), patellar tendinitis(5), achilles tendinitis(6), plantar fasciitis(7)), shoulder impingement syndrome(8) osteoarthritis of the knee(9-10) and avascular necrosis of femoral head(11). It acts by delievering high concentration of platelets derived growth factors and enhances tissue healing (12). Platelets present in PRP function as a tissue sealant, initiating wound repair (3) whereas fibrin matrix acts as a drug delivery system slowly releasing various platelet-derived bioactive factors (13) such as vascular endothelial growth factor (VEGF), transforming growth factor (TGF)-b1, insulin-like growth factor (IGF) and platelet derived growth factor (PDGF),(14,15). PRP platelets are initially activated by thrombin and collagen, releasing growth factors that attract undifferentiated cells into the newly formed matrix and trigger cell division (16). PRP also inhibits cytokine release from macrophages, improving tissue healing and regeneration by limiting the inflammation,(17) and can promote new capillary growth,(18). In this study we evaluate the safety and efficacy of PRP in patients suffering from tennis elbow.

MATERIAL AND METHODS

74 patients suffering from this condition who attended outpatient department of our institution, a 350 bedded tertiary care corporate hospital from July 2014 to July 2017 were included in this study. All these patients had failed to respond to conservative management and voluntarily signed the consent forms to undergo this procedure and be the part of this study.

The PRP used in this study was obtained using standard technique. The blood drawn from the patient was taken in 10 ml tubes that contained citrate phosphate dextrose. These tubes were then centrifuged two times. Only one third of the original blood sample consisted of PRP and was used. 2-3 ml of PRP so obtained was injected under all aseptic conditions at the local site.

Visual Analog Score (VAS), Disability of Arm Shoulder and Hand (DASH), and Patient Rated Tennis Elbow Evaluation (PRTEE) Questionarrie were used to evaluate the results. All of these are validated instruments for such use. The DASH questionnaire measures the incapacity of the upper limb as a single unit, always from the patient's perspective whereas PRTEE was developed solely to evaluate lateral epicondylitis of the elbow.

The patients were evaluated at 0 weeks, (at the time of injection), at 6 weeks, 12 weeks and 24 weeks after the injection.

Following categories of patients were excluded from the study

- Those who had some form of previous treatment to that elbow (local steroid injection) in last one month.
- Patients who had systemic diseases (diabetes, hypothyroidism and /or rheumatoid arthritis)
- Patients who had injury to that elbow
- Pregnant patients

RESULTS

The mean age of the patients in this study group was 37.5 ± 15.5 yr, and it included 48 men and 26 women.

Patients showed statistically significant improvement across all three measures of outcome. Mean value of VAS scores were 79.7 at 0 weeks, 37.2at 6 weeks (p value .0036), 30.07 at 12 weeks(p value .001) and 28.8 at 24 weeks(p value .0014). Mean value of DASH improved from 69.2 at 0 weeks to37.4 at 6 weeks (p value .0018), 32.3 at 12 weeks (p value .001) and 31.7 at 24 weeks (p value .001). Patients also showed improvement in terms of PRTEE scores when it decreased from 51.3 at 0 weeks to23.5 at 6 weeks (p value .0034) to16.7 at 12 weeks (p value .004) and 15.3 at 24 weeks (p value .002).

TABLE 1

	0 Weeks	6 Weeks	P value	12 Weeks	P value	24 Weeks	P value
VAS	79.7 + .76	37.2 + 6.2	.0036	30.07+5.2	.001	28.8+7.3	.0014
DASH	69.2 + 4.7	37.4 + 8.3	.0018	32.3+6.3	.001	31.7+7.5	.001
PRTEE	51.3 + 2.7	23.5 + 7.2	.0034	16.7+6.3	.002	15.3+2.3	.002

Table 1 shows the mean VAS, DASH and PRTEE scores of patients at 0 weeks, 6 weeks, 12 weeks, and 24 weeks

FIGURE 1

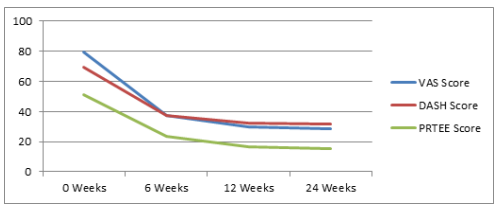

Figure 1 shows the mean VAS, DASH and PRTEE scores of patients at

0 weeks, 6 weeks, 12 weeks, and 24 weeks

DISCUSSION

Our study does suggest that local injection of PRP is an effective method to relieve pain and improve function in patients suffering with tennis elbow. Moreover it may be a safer option than surgery and local injection of steroids.

Our results are similar to those described by Mishra and Pavelko(19) who reported a significant improvement of symptoms after 8 wk in 60% of the patients treated with PRP. At the end of 6 mo, patients treated with PRP noted 81% improvement in their VAS pain scores (P ¼ 0.0001).

Our results also are in agreement with that observed by Peerbooms et al (20) who in their study based on improvement on the DASH scores, showed that treatment in 25 of the 49 patients (51%) with corticosteroid and 37 of the 51 patients (73%) with PRP group were successful (P ¼ 0.005). Both these studies offer encouraging results of an alternative minimally invasive treatment that addresses the pathophysiology of tennis elbow for which traditional nonsurgical modalities failed. In our study, we observed highly significant differences between VAS and DASH scores before and after injection ($P < 0.001$); After 12 to 24 weeks of injection, 75% patients had excellent VAS score improvement (> 50% reduction) and around 62% had reduction of DASH score (> 50%).

CONCLUSION

Tennis Elbow is a condition which causes significant morbidity and functional limitation. Patients often do not respond to conservative measures and repeated use of local injection of steroids may lead to serious consequences. Since patients showed improvement based on all three validated measures of outcome, our study does suggest that local injection of PRP appeared to be a safe, cost effective and effective procedure to relieve pain and improve symptoms in patients suffering from tennis elbow. However further follow up studies of long duration with placebo control are required to establish the long term efficacy of this treatment option.

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