

Assessing the effectiveness of PRP infiltration Vs Triamcinolone injection for management of lateral epicondylitis

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Abstract

Background: A common problem in the population today with a prevalence of 1%–3% is pain over the lateral aspect of elbow. A comparative study was done to assess the effectiveness of single infiltration of platelet-rich plasma (PRP) to a single injection of triamcinolone and a normal saline placebo injection for the management of Lateral Epicondyle pain of Humerus over a 6 month duration.

Materials and Methods: Visual analog scale (VAS) was used to evaluate the effectiveness of the different treatment modalities and a comparative study was done over a period of 6 months with 2nd, 4th month and 6th month followup following treatment. Out of 58 patients in the study, 27 were Females and 31 were Males. Patients included in the survey were between 20 and 40 years and belonged to either sex and had their complaints for over 3-month duration. Patients with elbow pain aetiology due to other problems or those who had previous treatment with any form of injection were excluded from the study. 1ml of 2% Xylocaine was injected before injecting the treatment modality formulation decided under trial. Pain scoring was done using VAS and FPS. Statistical analysis was done using Fisher's exact test at 12 and 24 weeks.

Results: 29 elbows were included in each group with 27 females and 31 males. At 2nd and 4th months, patients in both the PRP and triamcinolone groups had pain relief ($P < 0.05$). At the 6th month follow-up, statistically significant results of better pain relief was found with the PRP group when compared to the triamcinolone group. In triamcinolone group 13 patients had injection site hypopigmentation and 3 patients had subdermal atrophy.

Conclusion: After following up the patient it was seen that PRP gives better pain relief when compared to injection of triamcinolone as treatment of tennis elbow and there is also need for long term studies to assess the duration of symptom relief and to confirm the findings from our study.

Keywords: PRP, Platelet Rich Plasma, Infiltration, Triamcinolone, Steroid, Saline, Placebo, Lateral Epicondylitis, Tennis Elbow

Introduction

Lateral elbow pain is a common condition with a population prevalence of 1-3% [1]. The peak incidence is around 40 - 50 years [2]. More common in females compared to males. Term "Lawn-tennis Elbow" was coined in 1883 [3]. Term "Angiofibroblastic Tendinosis" coined by Nirschel et al [4,5]. Term "Tennis Elbow" is the common name used [6].

Condition starts as a micro-tear in extensor carpi radialis brevis [7]. Acute onset of symptoms are more common

in young athletes. Chronic, Recalcitrant symptoms occur more often in older patients [6].

Mostly treated conservatively, most patients improve with rest and time.

Patients who fail to respond to conservative therapy are considered for other modes of treatment [8].

Non-operative management

Methods of Non-Operative Treatment includes:

Rehabilitative resistance exercises

Corticosteroid injection [9]

Autologous blood injection [10]

Extracorporeal Shock Wave Therapy [11]

Botulinium toxin injection [12]

Hyaluronic acid with Chondroitin sulphate injection [13]



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Important reservoir of growth factors

Role in Coagulation, Immune response, Angiogenesis and Healing of damaged tissues. PDGF, TGF, PF-IL, PDAF, VEGF, EGF, ILGF and Fibronectin are proteins contained in Alpha-granules of Platelets [14].

Single or Multiple injections of PRP have shown to be of significance in management of tennis elbow.

Efficacy of PRP in Lateral Epicondylitis compared to other modalities can be revealed by RCT [15].

Aim of the study

To find out the efficacy of PRP infiltration for Lateral epicondylitis compared to Steroid infiltration

To evaluate the functional outcome of PRP and Steroid infiltration.

Materials & Methods

Study was conducted from December 2018 to May 2019 at our college after getting Ethical Committee clearance.

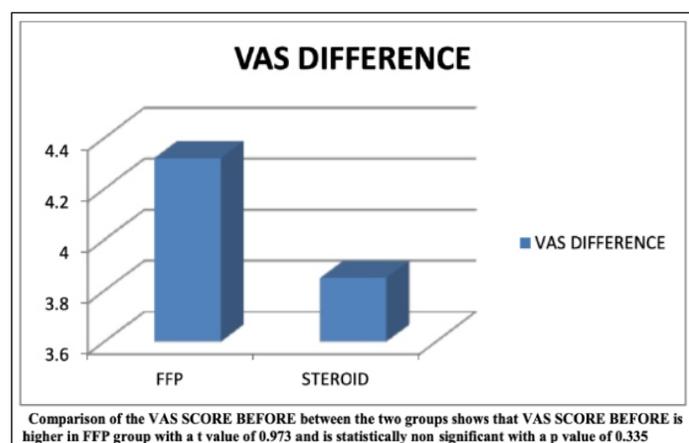
Patients in age group of 20-50 years of either sex who had clinical symptoms suggestive of Tennis Elbow were included in the study.

Patients who received any previous treatment such as infiltration around the elbow were excluded from the study.

Patients who were suffering from symptoms around elbow due to other causes like inflammatory arthropathies, PIN syndrome, osteochondritis dissecans of elbow and pain referred from cervical spine were also excluded.

After obtaining consent, all patients were subjected to routine blood investigations and radiographic examinations.

Patient clinically diagnosed to have tennis elbow after excluding other DDx were subjected to USG examination to confirm Dx.



Patients were randomised into 2 groups

1st Group received autologous PRP infiltration

2nd Group got Steroid - Triamcinolone injection

Results were recorded using VAS (Visual Analog Scale) Score.

Score were recorded in prepared Proforma on the day of injection before giving the injection, at 8 weeks, 16 weeks and after 24 weeks.

The results were analysed using Fisher's Exact Test

After the injection, patients were given paracetamol for initial pain relief in all 3 groups

Patients were advised rest during initial 2 weeks in form of refraining from strenuous activities and same protocol for bilateral cases

PRP Injection

15ml of patient's blood taken from patient's cubital vein PRP prepared using differential centrifugation technique with 2 spins

Blood collected in 3 citrate tubes having 0.9% sodium citrate as anticoagulant.

1st spin performed at 3200 rpm for 5mins using laboratory centrifuge and separates RBC from rest of the components.

Upper half of supernatant was discarded and lower half from all 3 tubes transferred into another plain tube for the 2nd spin at 3300rpm for 3mins and upper half of supernatant discarded.

1ml of lower half was taken into a 1ml syringe having 0.1ml of Calcium chloride and at end of PRP preparation samples sent for platelet count.

Site of injection was 5mm distal to lateral epicondyle in the extensor tendons, particularly ECRB tendon.

Skin was painted with providone-iodine and ethyl alcohol.

1ml of 2% lignocaine with adrenaline was injected at the injection site after test dose.

After 10mins, the proposed injection was injected on and around the tendon and not inside the the tendon.

If any resistance was felt during injection, the needle is withdrawn a bit and injected again and patients advised on postinjection care.

Results

58 patients (27 females and 31 males) in the age group of 20-50 years were included.

29 elbows in each group.

Out of 58 patients, 14 males and 15 females recieved PRP

and 17 males and 12 females received Triamcinolone. Mean ranks in both groups are similar on day of injection for both VAS.

At 8 week followup, VAS score in PRP group 26 patients (89.7%) felt better and in Triamcinolone group all 29 patients (100%) were better.

At 16 week followup, in PRP group 23 patients. (79.3%) had no recurrence of pain, 3 were lost to follow up and 2 patients (6.9%) experienced recurrence of pain; while 27 patients (93.1%) in triamcinolone group had no recurrence and 2 patients were lost to followup.

At 24 weeks, no patients in PRP group had reappearance of pain while 7 patients (24.1%) in triamcinolone group experienced reappearance of pain

No side effects were noted in PRP group while Burning sensation and dark pigmentation of skin was noted in 5 patients (17.2%) of Triamcinolone group.

The pain scores improved in both PRP and triamcinolone group but worsened in the normal saline group at both 12- and 24-week followup.

At 24 weeks, the improvement in pain was more with PRP than with triamcinolone where most patients had a relapse of pain.

P values calculated showed that on the day of injection, it is not significant for both VAS score (P = 0.517) and FPS score (P=0.960).

Hence, on the day of injection, there was no significant difference in pain relief.

However, at both 12 weeks and 24 weeks, the P < 0.001 for both VAS and FPS scores.

As both PRP and triamcinolone showed improvement in mean ranks, we conclude that PRP and triamcinolone showed statistically significant improvement in pain scores than placebo at 12 weeks and 24 weeks.

Post hoc analysis done showed a significant difference between VAS and FPS scores of PRP group than triamcinolone and normal saline group at 24 weeks

At 12 weeks, the scores were not significant between PRP and triamcinolone groups.

No complications were found in the group receiving PRP and placebo.

13 out of 30 elbows which received triamcinolone injection had hypopigmentation at the injection site and of these 3 had associated subdermal atrophy.

No infection was there in any of the patients.

Discussion

LE is the most common cause of lateral elbow pain in adults that is encountered in day-to-day practice by most orthopedic surgeons.

Although typically self-limiting, there are many nonsurgical and surgical treatment options available if LE becomes chronic and continues to cause pain.

PRP injection has been shown to be a promising option in various multicenter studies but there are conflicting reports that state PRP might not be as effective as predicted.

Krogh et al. in their study concluded that at 3-month followup, there was no significant reduction in pain in any of the three groups, but Triamcinolone group showed greater decrease in tendon thickness and Doppler activity and the injection of PRP was found to be the most painful [16].

Brkljac et al. in their study concluded that PRP injection improved pain and function in patients suffering from LE where conservative management has failed [17].

Raeissadat et al. in their study found that PRP and autologous whole blood injections are both effective and efficacy persisted long term but PRP was not superior to AWB in long term followup [18].

Peerbooms et al. in their study after 1-year followup found that treatment of patients with chronic LE with PRP reduces pain and significantly increases function, exceeding the effect of corticosteroid injection [19].

Gosens et al. in their study concluded that treatment of patients with chronic LE with PRP reduces pain and increases function significantly, exceeding the effect of corticosteroid injection even after a followup of 2 years.

There were no complications related to the use of PRP [20].

Arirachakaran et al. in their study concluded that PRP injection can improve pain and lower the risk of complications, whereas autologous blood injection can improve pain, disabilities scores, and pressure pain threshold but has a higher risk of complications [21].

In our study, at 12-week followup, the pain relief was

Scores	Student T Test				T	df	P Value
	Injection given	n	Mean rank	Std. Deviation			
Age	PRP	29	41.69	8.346	-0.206	56	0.837
	Triamcinolone	29	42.14	8.189			
	Total	58					
VAS score day 0	PRP	29	5.17	2.172	0.973	56	0.335
	Triamcinolone	29	4.62	2.145			
	Total	58					
VAS score after 6 m	PRP	25	0.82	1.155	-0.456	50	0.651
	Triamcinolone	27	0.96	1.4			
	Total	58					
VAS difference	PRP	27	4.32	1.49	1.143	50	0.258
	Triamcinolone	25	3.85	1.46			
	Total	58					

better in both PRP and triamcinolone groups as compared with the normal saline group

At 24-week followup, the pain relief was maintained better with PRP than corticosteroid. Patients who had received triamcinilone were asymptomatic at 3-month followup, but at 6-month followup, 33.33% patients complained of a recurrence of pain symptoms that was more than 50% of the initial VAS.

In PRP group, only 13.33% of patients were symptomatic with VAS score and FPS score more than 50% of the initial value. The difference between PRP and corticosteroid injections was statistically significant. Krogh et al. in their study concluded that the injection of PRP was the most painful [16].

Mishra and Pavelko in their study concluded that treatment of patients with chronic elbow tendinosis with buffered PRP reduced pain significantly. They initially injected bupivacaine with epinephrine into the skin and subcutaneous tissue as a local field block and then 0.5 ml directly into the area of maximum tenderness. Then, 2–3 ml PRP was injected using a 22-gauge needle into the common extensor tendon using a peppering technique. This technique involved a single skin portal and then five penetrations of the tendon [22].

In our study, we used 2% Xylocaine local infiltration before injection in all three groups and injection was given at the common extensor tendon using peppering technique.

Injections were given carefully to avoid directly injecting into the tendon. None of the patient reported pain after PRP injection in our study.

Gautam et al. concluded that PRP appeared to enable biological healing of the lesion, whereas corticosteroid

appeared to provide short term, symptomatic relief but resulted in tendon degeneration [23].

Park et al. in their study concluded that 1.3%–4% people develop hypopigmentation which develops over the initial 1–4 months after the injection and resolves spontaneously over 6–30 months. It can be prevented if intradermal and subcutaneous injections are avoided. Subcutaneous fat atrophy is known to last for 6–12 months after corticosteroid injection, and it is known to be reversible and resolved within 1 year [24].

Our study found that 13 patients out of the thirty patients who received corticosteroid suffered from hypopigmentation at injection site, and three patients suffered from subdermal atrophy. The limitation of the study is that sample size needed for the study was not calculated.

Conclusion

The efficacy of single injection of PRP to relieve the pain of tennis elbow is better than triamcinolone or placebo over a short term followup period. However, still more studies are required at different centers by different research groups to establish the efficacy of PRP over long term followup period, and multicenter randomized controlled trial would further strengthen evidence-based practice in treatment of LE or tennis elbow.

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