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Dr. Sameer Wooly
Associate Professor, Department of Orthopedics, PESIMSR, Kuppam, Andhra Pradesh, India

Dr. Nunnabhatla Keerthi
Post Graduate, Department of Orthopedics, PESIMSR, Kuppam, Andhra Pradesh, India

Dr. Venkatesh Reddy
Professor, Department of Orthopedics, PESIMSR, Kuppam, Andhra Pradesh, India

Dr. Sudeep Madhukar Nambiar
Assistant Professor, Department of Orthopedics, PESIMSR, Kuppam, Andhra Pradesh, India

Corresponding Author:
Dr. Sudeep Madhukar Nambiar
Assistant Professor, Department of Orthopedics, PESIMSR, Kuppam, Andhra Pradesh, India

The efficacy of platelet rich plasma injections with steroid injections in treatment of lateral epicondylitis

Dr. Sameer Wooly, Dr. Nunnabhatla Keerthi, Dr. Venkatesh Reddy and Dr. Sudeep Madhukar Nambiar

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Abstract
Previously Injection of corticosteroids was thought to be the gold standard treatment in lateral epicondylitis. The autologus blood injection and different types of open and arthroscopic operative treatment are also advised for lateral epicondylitis recently. At present, platelet rich plasma (PRP) is considered as an ideal biological autologous blood derived component. All patients seen and clinically diagnosed as lateral epicondylitis and satisfying the inclusion criteria are selected. After obtaining written consent by simple random sampling alternatively patient received steroid injections and platelet rich plasma injections under strict aseptic precautions and were divided into group A group B respectively. In this study PRP and Corticosteroid treated groups had pre injection GRIP STRENGTH of 26.7 and 26.8 respectively with P=0.9. Post injection at 1 month follow up GRIP STRENGTH showed a significant increase in Corticosteroid group (30) as compared to PRP group (29).

Keywords: platelet rich plasma injections, steroid injections, lateral epicondylitis

Introduction
Lateral epicondylitis was first described by Runge in 1873. It is defined as inflammation of lateral epicondyle origin of extensor tendons of forearm. It is the commonest chronic disabling painful condition of the elbow. It causes symptoms in 1% to 3% of the general population. Although named as tennis elbow it is seen more commonly in non-athletes than athletes. The age of onset of lateral epicondylitis is 40-50years. The incidence increased to 10% in women aged 40-46 years age group. This is seen most commonly in people who do activities that require repeated pronation and supination movements of forearm & flexion and extension of wrist [1, 2].

The actual cause of lateral epicondylitis is not clearly understood. Now it is considered that degenerative process occurs at the common extensor tendon origin of the wrist and fingers due to overuse and abnormal microvascular responses. Nirschl observed that the basic pathology was in the origin of the extensor carpi radialis brevis (ECRB) tendon. But sometimes the anteromedial edge of extensor digitorum communis (EDC) and the deep surface of extensor carpi radialis longus (ECRL) may also be involved [3].

Nonoperative methods like oral NSAIDS, strapping, physiotherapy are the main stay of treatment being effective in more than 95% of cases.

Previously Injection of corticosteroids was thought to be the gold standard treatment in lateral epicondyliis. The autologus blood injection and different types of open and arthroscopic operative treatment are also advised for lateral epicondylitis recently. At present, platelet rich plasma (PRP) is considered as an ideal biological autologous blood derived component [4].

Platelet rich plasma which is a good source of many growth factors & cytokines like PDGF, TGF-beta, IGF-1, IGF-2, FGF, VEGF, EGF. keratinocyte growth factors & connective tissue growth factors is one of the new way of treating this painful & disabling condition. These growth factors released from platelet rich plasma promote healing of wound, tendons and bone at cellular level. In addition, platelet rich plasma has high antimicrobial potency and this property may prevent infections. It has shown promise in many studies as compared to steroid injection & other modes of conservative treatment [5, 6].

Methodology

All patients seen and clinically diagnosed as lateral epicondylitis and satisfying the inclusion criteria are selected. After obtaining written consent by simple random sampling alternatively patient received steroid injections and platelet rich plasma injections under strict aseptic precautions and were divided into group A group B respectively

All patients were prospectively evaluated by visual analogue score, mayo elbow score, DASH score and grip strength. The scores were recorded on initial presentation and post treatment follow-up visit at 1st month, 3rd month and 6th month

Blood Collection

In the preparation of P-PRP, Blood is withdrawn from cubital vein with help of BD vacutainer eclipse in two BD vacutainer tubes. BD vacutainer is a 2.7 ml tube that contained 0.35 ml of 3.2% sodium citrate, an anticoagulant &volume of approximate 2.35 ml for whole blood.

The objective of the anticoagulant is to bind calcium which stops the clotting cascade by preventing the conversion of prothrombin to thrombin Post injection, the patient was kept in a supine position without moving the arm for 15 minutes. Patients were sent home with instructions to rest the arm for 24 hours.

For post injection pain, patients were allowed to use acetaminophen for a maximum of 1 week,but the use of NSAIDS was prohibited.

Patients are followed up at 1 month, 3rd month and 6th month with VAS, DASH score, Mayo elbow score and grip strength

Results:

Table 1: Dash Score (Disability Arm Shoulder Hand Score)

Dash Score	Steroid (n=30)		PRP (n=30	
	Mean	S.D	Mean	S.D
Pre Injection	47.7	4.3	48.9	4.4
1 Month	36.6	3.7	39.2	3.8
3 Month	34	3.1	32.2	4.3
6 Month	35.7	4.2	25.5	6

In this study PRP and Corticosteroid treated groups had pre injection DASH of 47.7 and 48.9 respectively with p=0.3. Post injection at 1 month follow up DASH showed a significant decrease in Corticosteroid group (36.6) as compared to PRP group (39.2). At the end of 3 months, the DASH had further decreased in both Corticosteroid group (34) and PRP group (32.2). At the end of 6 months, the PRP group (25.5) showed significant reduction in DASH compared to Corticosteroid group (35.7). This shows that Corticosteroid is more effective for short term relief and PRP is more effective for long term relief.

The difference between two group was statistically significant at 1 month (p=0.001),3rd month (p=0.001) and 6th month (p = 0.001)

Table 2: Mayo Elbow Score

Mayo Elbow Score	Steroid (n=30)		Prp (n=30	
	Mean	S.D	Mean	S.D
Pre Injection	59.5	7	58.7	6.4
1 Month	75.8	5.4	73.3	6.1
3 Month	79	5.6	81	5
6 Month	78.2	5	88.3	7

Follow up MAYO elbow score showed a significant increase in Corticosteroid group (75.8) as compared to PRP group (73.5) with p< 0.001. At the end of 3 months, the MAYO elbow score further increased in both Corticosteroid group (79) and PRP group (81). At the end of 6 months, the PRP group (85.7) showed significant increase in MAYO elbow score compared to Corticosteroid group (78.2).

This shows that Corticosteroid is more effective for short term relief and PRP is more effective for long term relief.

The difference between two group was statistically significant at 1 month (p=0.001),3rd month (p=0.001) and 6th month (p = 0.001)

Table 3: Grip Strength

Grip Strength	Steroid(N=30)		Prp(N=30	
	Mean	S.D	Mean	S.D
Pre Injection	26.7	5	26.8	4.2
1 Month	30	4.3	29	3.3
3 Month	31.4	3.2	33	2.5
6 Month	32	0.2	35.1	0.6

In this study PRP and Corticosteroid treated groups had pre injection GRIP STRENGTH of 26.7 and 26.8 respectively with P=0.9. Post injection at 1 month follow up GRIP STRENGTH showed a significant increase in Corticosteroid group (30) as compared to PRP group (29). At the end of 3 months, the GRIP STRENGTH further increased in both Corticosteroid group (31.4) and PRP group (33). At the end of 6 months, the PRP group (35.1) showed significant increase in GRIP STRENGTH compared to Corticosteroid group (32). This shows that Corticosteroid is more effective for short term relief and PRP is more effective for long term relief.

The difference between two group was statistically significant at 1 month(p=0.001),3rd month (p=0.001) and 6th month (p = 0.001)

Discussion

My results for PRP treated group are comparable to that observed by Peerbooms *et al*. 2011 study who reported that, PRP-treated patients at the end of 6 months showed a mean improvement of 53.5% (70.1 to 32.6) to 58.5% in this study. DASH scores had improved a 51% (161.3 to 79.5) versus 56.5%in this study

But the results in corticosteroid group are better in this study.In their study corticosteroid-treated patients showed a mean 14.0% improvement (65.8 to 50.1) in VAS scores versus 26% in this study DASH scores had improved 10.7% (131.3 to 108.4) in corticosteroid-treated patients versus a 25% improvement in this study Our study shows that corticosteroid group was actually better initially and then declined when compared to PRP group.

In a study by vk Gautam 2015 the grip strength in steroid group gained 4kgs (19kg-23kg) which is comparable to this study 5kg (22kg-27kg). In PRP group, 7kgs (18kgs-25kg) gain is seen which is similar to this study 7kgs (25kg-32kg) [7]

The MAYO ELBOW score results of this study are coherent with that of the study conducted by Ankit varshney 2017 where in PRP-treated patients showed a mean 54.4% improvement (61.51–95.0) to 50.4 improvement (58.7-88.26) in this study. But their study showed only 1.25% improvement (63.92–63.12) in steroid-treated patients which is lower to 33% improvement seen in this study [8].

Successful treatment was defined as more than a 25% reduction in visual analogue score or DASH score and more than 75 score in Mayo elbow performance score.

The results showed that 16 of the 30 patients (53%) in the corticosteroid group and 23 of the 30 patients (77%) in the PRP group were successful with the VAS score, which was

significant (P =0 .001). 17 of the 30 patients (57%) in the corticosteroid group and 22 of the 30 patients (73%) in the PRP group were successful with the DASH score, which was also significant (P = .005). Mayo elbow performance score was successful in 60% in corticosteroid group and 87% in PRP group.

Conclusion

PRP injection for chronic lateral epicondylitis reduces pain, improves functionality and hand grip strength when compared to steroid injection.

There was a significant difference in decrease of pain and disability of function after the platelet application.

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