

Results of Platelet Rich Plasma Injection in Chronic Lateral Humeral Epicondylar Tendinopathy

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ABSTRACT

Background: Lateral humeral epicondylitis or tennis elbow is one of the commonest causes of pain around elbow. Platelet rich plasma is a stimulant for repair in various tendinopathies. Previous studies have suggested platelet rich plasma as a safe & effective treatment option in tennis elbow.

Objective: To evaluate the clinical efficacy in terms of relief of pain & functional improvement after PRP injection in patients with chronic tennis elbow.

Materials & Method: The trial was conducted in a tertiary care hospital in 70 patients over a period of 2 years. 3ml of PRP was injected in & around the Extensor Carpi Radialis Brevis. Pain relief & functional improvement were assessed using visual analogue scale & q-DASH scale at 1 month, 3 months, 6 months & 1 year.

Results: The mean Nirschl pain score & q-DASH started improving after 02 weeks but significant improvement was seen after 3 months & pain decreased continuously for up to 1 year ($p < 0.0001$).

Conclusion: PRP offers a significant pain relief & functional improvement from 3 months to 1 year after injection.

Keywords: Lateral epicondylar tendinopathy, platelet rich plasma

INTRODUCTION

Lateral elbow tendinopathy, also called lateral epicondylitis or Tennis elbow is a common condition resulting from angiofibroblastic degeneration of the origin of Extensor Carpi Radialis Brevis (ECRB).⁽¹⁾ This condition was first described in 1883⁽²⁾ and although the diagnosis is simple, yet there is no general agreement regarding optimal treatment.⁽³⁾ The first line Rx is rest, NSAIDS, activity modification, physical therapy & bracing. If first line Rx fails, the 2nd line Rx with cortisone injection, autologous blood injection, prolotherapy, platelet rich plasma injections, extra corporeal shock wave therapy & application of botulinum toxin can be used. Local cortisone injection provides only a short term pain relief.⁽⁴⁾ If patients continue to have pain and dysfunction for more than 6 months with conservative Rx, then surgical procedures are indicated.⁽⁵⁾

Apart from being the mediators of the coagulation pathway, platelets contain nearly 300 bioactive cytokines and growth factors that coordinate cellular communication.⁽⁶⁾ PRP enhances tendon cell proliferation, differentiation and maturation.⁽⁷⁾ PRP may be more effective as a healing agent due to its high content of various growth factors. However studies with PRP Rx have produced variable results.⁽⁸⁾ Hence this study was conducted with an aim to assess the efficacy of PRP in lateral elbow tendinopathy.

MATERIALS AND METHODS

A prospective study regarding clinical efficacy of local injection of PRP in terms of relief of pain and functional outcome was carried out in S.G.R.H, Lahore from June 2015 to June 2017. Ethical clearance was obtained before starting the study. Seventy patients of both genders between 25 -60 years of age suffering from lateral elbow tendinopathy were included in the study after getting informed written consent. Duration of symptoms ranged

from one month to three months with previous history of medication or no treatment at all. A 15 days washout period was given to all the patients on medication. Complete physical examination and investigations including CBC. Fasting blood sugar & plain x-ray of the elbow were done. Patients with pregnancy, bleeding disorders, cervical radiculopathy, carpal tunnel syndrome, Diabetes, R.A, Hypothyroidism, abnormal platelet count, history of arthritis, fracture or surgery around the elbow & patients who received local steroid inj. within 6 weeks were not included in the study.

Results regarding relief of pain were evaluated according to four point pain scale & Nirschl staging system of pain which are simple to use & have been used in other studies as well.

Table No.1:

Phase	Clinical features
Phase 1	Mild pain with exercise, resolve within 24 h
Phase 2	Pain after exercise, exceeding 48 h
Phase 3	Pain with exercise, does not alter activity
Phase 4	Pain with exercise, alter activity
Phase 5	Pain with heavy activity of daily living
Phase 6	Pain with light activity of daily living, intermittent pain at rest
Phase 7	Constant pain at rest, disrupt sleep

Prp Preparation & Procedure Technique: 30ml of venous blood was drawn & mixed with an anticoagulant (ACD-A) & centrifuged at 3200 rpm for 15 minutes. This produced leucocyte enriched PRP with platelets 5X Baseline. PRP was buffered to physiological PH using 8.4% sodium carbonate to neutralize the acidic ACD-A in the PRP. The injection site was blocked with 0.5% bupivacane & then 3 ml of PRP was injected into ECRB tendon & adjacent tissue with a peppering pattern (5 penetrations of the tendon through single skin penetration).

After 48 hours of injection, patient were advised standard stretching exercises for 2 weeks .At 3 weeks after the injection, Patients were allowed for sports and daily activities as tolerated & were followed up after 01 month, 03 month , 06 months and at 01 year for assessment of pain relief & functional outcome.

Parameters Measured: Pain Relief: This was assesses using the visual Analog Scale (VAS, 0-10) in addition to other symptoms like numbness , paresthesia & weakness with gripping (Y/N). Tenderness to palpation over lateral epicondyle(Y/N), pain on resisted wrist extension (Y/N) elbow range of motion, return to work (Y/N) , mean grip strength (kg) & failure requiring other measures.

Functional outcome: It was gauged by using quick Disabilities of the Arm, Shoulder & Hand scale (q-DASH) which is a shortened version of DASH & uses 11 items instead of 30 items to measure physical function & symptoms of upper limb having musculoskeletal disorder.

RESULTS

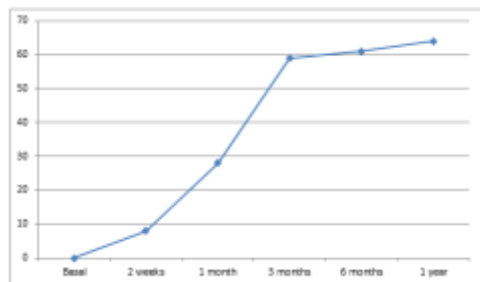
A total number of 70patients of ages ranging from 25 years to 60 years (mean age 39.2 years) of both genders, 28 males (40%) & 42 females (60%) fulfilling the inclusive criteria were included in the study. Duration of symptoms ranged from 1 month to 3 months (mean 2.0 months)

Table No.2: Basic Patient's Characteristics

Characteristics	Study Sample n=70
Mean Age (years)	39.2
Gender	
• Male	28 (40.0%)
• Female	42 (60.0%)
Mean Duration of Symptoms (months)	2
Elbow Disability	
• Yes	55 (47.14%)
• No	37 (52.86%)
Elbow Swelling	
• Yes	9 (12.86%)
• No	61 (87.14%)
Reduced Grip Strength	
• Yes	21 (30.0%)
• No	49 (70.0%)

There were no complications like infection, worsening of the symptoms or neurovascular problems during the study. Improvement in pain after PRP injection was assessed using the VAS (visual analog score). There was little pain relief at 02 weeks after the PRP injection . However at the end of 3 months, pain relief was significant (P<0.0001).

Pain decreased continuously upto 1 year in 78.6% of patients. Local tenderness and pain on resisted wrist extension also decreased progressively after 3months of injection. Same degree of improvement in grip strength was noted at 3 months after injection.



Graph No.1:

There was gradual and persistent improvement in functional outcome as measured by q-DASH scale. Like improvement in pain and grip strength , q-DASH also showed better improvement (p<0.001) from three months to one year after injection. There was no or little effect of the injection in the first 2 weeks. Only a few patients (23%) reported some pain relief at the end of one month. But significant improvement in all the 3 parameters (pain relief, grip strength & functional outcome) was observed at 3 months & onwards up to one year .

DISCUSSION

Chronic lateral epicondylar tendinopathy or tennis elbow is a common problem seen by orthopedic surgeons . Several studies report female preponderance ⁽¹⁰⁾ This finding is observed in present study as well . The dominant arm is involved more commonly and the incidence is not different in all the social economic groups.⁽¹¹⁾ This may be self limiting or often responds to rest, NSAIDS, physical therapy &corticosteroid injections which has tendency to relapse and recur . Extra carporeal shock wave therapy is no better than placebo.⁽¹²⁾ The present study is therefore conducted to evaluate the clinical efficacy of platelet rich plasma injection in patients with tennis elbow. PRP is an ideal autologous biological blood derived product that release high concentration of platelet derived growth factors locally at the site of injection and enhances tendon healing due to its effects on angiogenesis & collagen syntheses .

A recent double blind randomized control study by Aziza Sayed Omar, et al has reported that effect of PRP injection lasts for more then 6 months in providing pain relief in tennis elbow and planter fasciitis.⁽¹³⁾ The findings of our study regarding significant improvement in pain relief , grip strength and functional out come at 3 months are consistent with the work of Gosens T et al and Kamezi et al.^(14,15) PRP offers a better and significant long term solution for pain relief and functional disability in patients with tennis elbow.

CONCLUSION

PRP offers a better & significant pain relief& functional outcome from 3 months to one year after injection in pts with lateral elbow tendinopathy. PRP injection is a valid first line treatment option to promote tendon healing. It is less time consuming& has an autologous nature with easy application.

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