

Outcome Following Platelet Rich Plasma Injection In Patients Of Chronic Lateral Epicondylitis

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Abstract

Background: Various modalities of management are available for lateral epicondylitis which is a common cause of pain around elbow. Many studies have suggested the use of prp (platelet rich plasma) as a safe and effective mode of therapy.

Material and Methods: purpose of this study was to assess the efficacy of prp injection in patients of chronic lateral epicondylitis. It was an interventional study of 70 cases with at least 6 months of symptoms and failed conventional therapy. PRP was prepared from 40 ml autologous venous blood by double centrifugation method. Patients were followed upto 6 months. An analysis of result with regards to pain (vas score) was done.

Results: Right elbow was predominantly affected in our sample. Mean age of patients was 41 years. Success was defined as reduction of pain (vas) without re-intervention after a follow up of 6 months. In all patients there was improvement in vas score .pre injection mean vas score of patients was 7.04 and at final follow-up it was 1.84. There was 74 % improvement in vas score. There was progressive improvement with no complications.

Conclusion: Treatment of patients with tennis elbow with prp decreases pain and significantly increases function, even after a follow-up of 6 months.

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Introduction

Lateral epicondylitis, or “tennis elbow,” is a frequently reported condition in medical care. The complaint is characterized by pain over the lateral epicondyle of the humerus, which is aggravated with resisted dorsiflexion of the wrist. The incidence is approximately 4 to 7 per 1000 patients per year.

Affected lesion could be common extensor tendon, extensor Carpi radialis brevis (ECRB), or radial collateral ligament. It is

evident that affected tendons have undergone a process of mucoid degeneration and tearing.

Pain may be due to irritation of mechanoreceptors by traction or shear forces or activation of nonreceptive receptors by neurotransmitters such as substance P ⁽¹⁾ .

Several new treatments have been developed in an attempt to stimulate tissue

regeneration. One of these treatments is an injection of platelet-rich plasma (PRP).

The use of autologous growth factors in the form of platelet rich plasma (PRP) may be just the beginning of a new medical frontier known as “orthobiologics.” Platelet-rich plasma (PRP) is a new technology focused on enhancing the healing response after injury of different tissue types⁽²⁾.

As PRP is from patient’s own blood, it is free of transmissible diseases and cannot cause hypersensitivity reactions. The minimum platelet count required for a blood clot to qualify as PRP may be arguable but a concentration of about 1 million platelets/ μ L or about 4 to 7 times the usual baseline platelet count (i.e., 2,00,000 platelets/ μ L) has been shown to provide clinical benefits⁽³⁾.

PRP is created from an autologous whole blood sample through a platelet separation process, which results in an increased platelet concentration compared with the original whole blood sample⁽⁴⁾. It is theorized that when PRP is injected into an area of tendinopathy, the platelets release a multitude of growth factors and stimulate a healing response⁽⁵⁾.

Material and Methods

This Prospective study for assessment of clinical effect of platelet rich plasma in tennis elbow was conducted in Department of Orthopaedics Gajra Raja Medical College and Jayarogya group of Hospital, Gwalior (M.P.).

All patients of “chronic tennis elbow” with atleast 6 month duration of symptoms who came to OPD of Department of Orthopaedics were included in the study.

Total 70 diagnosed cases of tennis elbow on the basis of clinical examination who met the inclusion criteria were included for the study. Patients who did not give consent for

the procedure were excluded from the study.

PRP preparation was done from 40 ml of autologous blood. Blood was centrifuged at two levels, first 800 rpm for 10 minutes and second at 2400 rpm for 10 minutes. Patients are analyzed for pain using VAS score.

Inclusion criteria were patients having age between 20 to 70 years, duration of symptoms at least 6 months and pain ranking at least 5 on a 10 point scale.

Exclusion criteria were patients with tendon rupture or post surgical tendon repair, acute inflammatory disease, febrile or infectious disease, malignancy, history of autoimmune platelet disorder, history of consistent use of NSAIDs and systemic steroid use, anemic patients, patients having platelet count less than 150,000 per micro litre, diabetic and pregnant woman.

Injection Technique

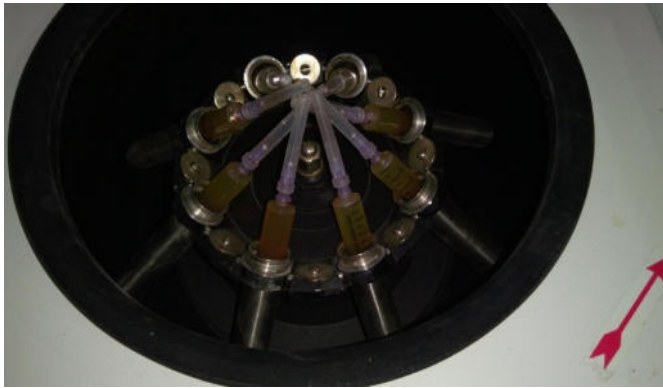
2 ml of PRP solution injected directly into the area of maximum tenderness using a 22-g needle into the common extensor tendon using a *peppering technique*. This technique involved a single skin portal and then 5 penetrations of the tendon.

Post Procedure Protocol

Immediately after the injection, the patient was kept in a supine position without moving the arm for 15 minutes. Patients were sent home with instructions to limit their use of the arm for approximately 24 hours and use acetaminophen for pain. A formal stretching and strengthening exercises of forearm muscles were initiated on 2nd day after injection. At 4 weeks after the procedure, patients are allowed to proceed with normal sporting or recreational activities as tolerated. The patients were examined at 4 weeks, 8 weeks and 6 months after the procedure. A 10-mm visual analog pain

score (0, no pain; 10, worst pain possible)

were used as outcome measures.



After completion of 1st centrifugation step

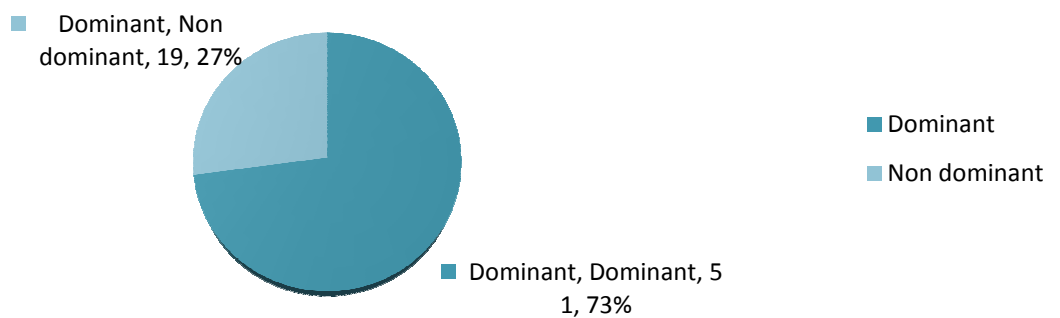


After completion of 2nd centrifugation step

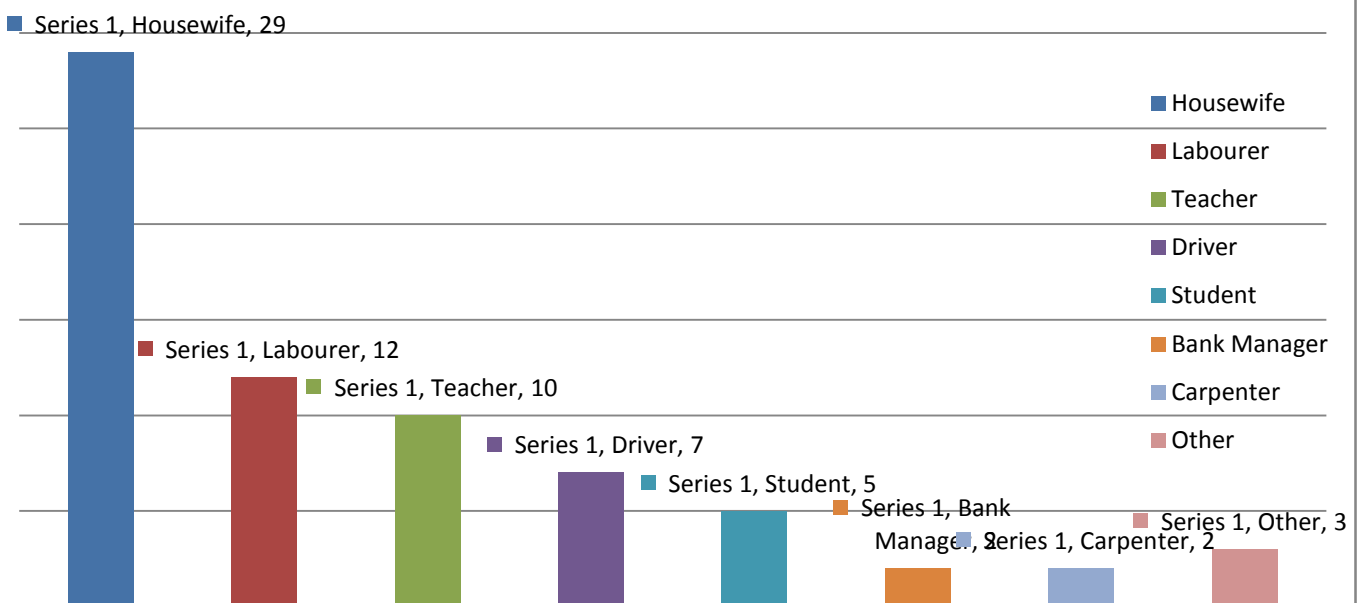
Observations and Results A total of 70 patients were included in the study. Age range was 20 to 70 years with mean age of 41 years. Maximum no of patients were in age group of 31-40 years (43 were females and 27 were male). Dominant side was most

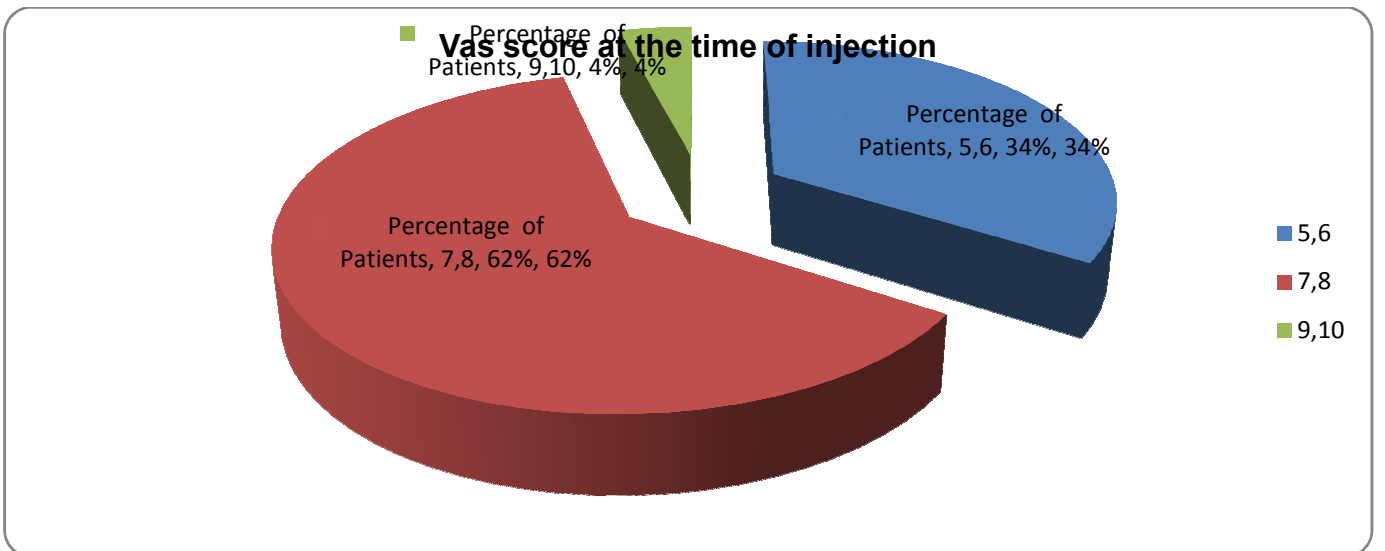
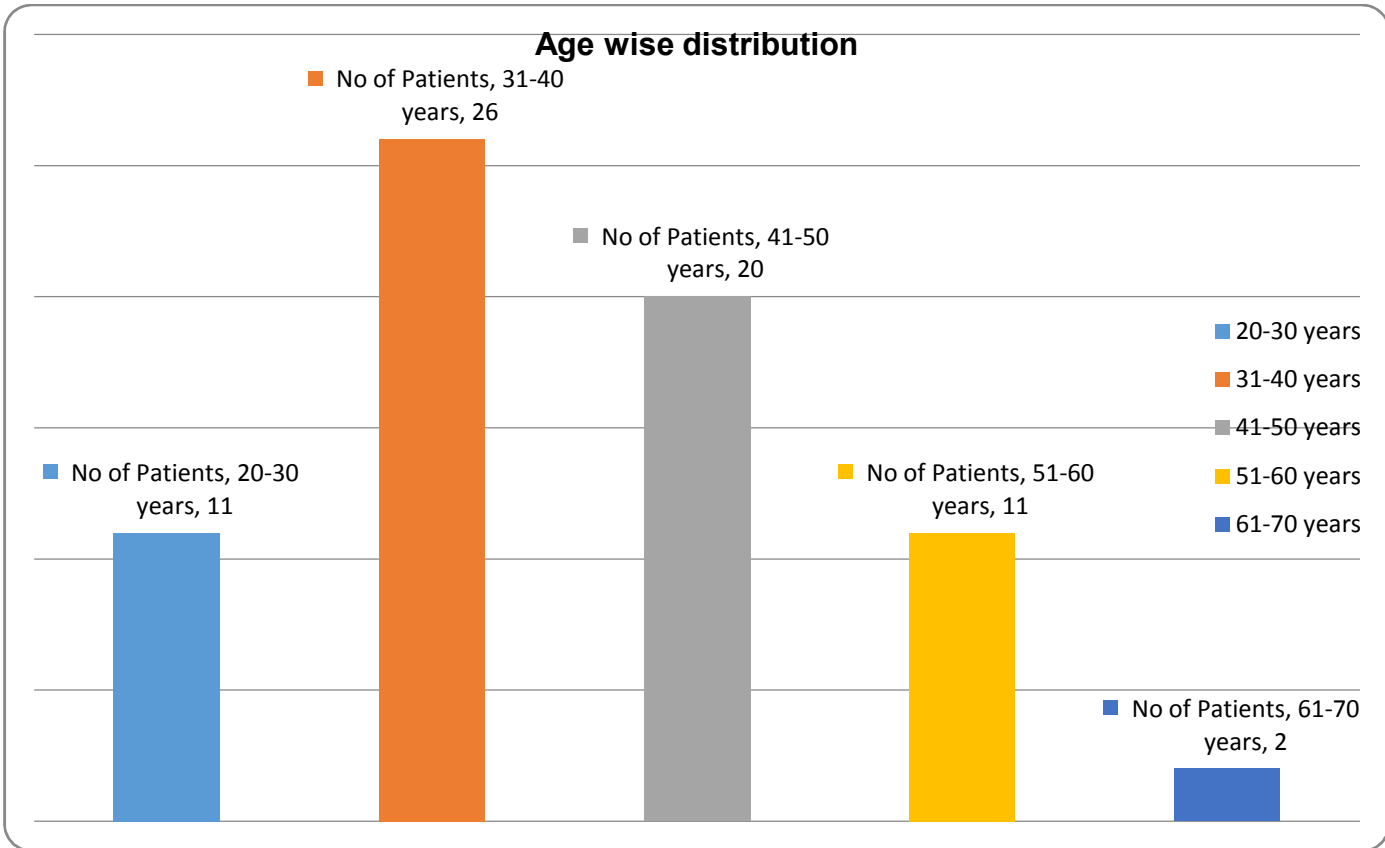
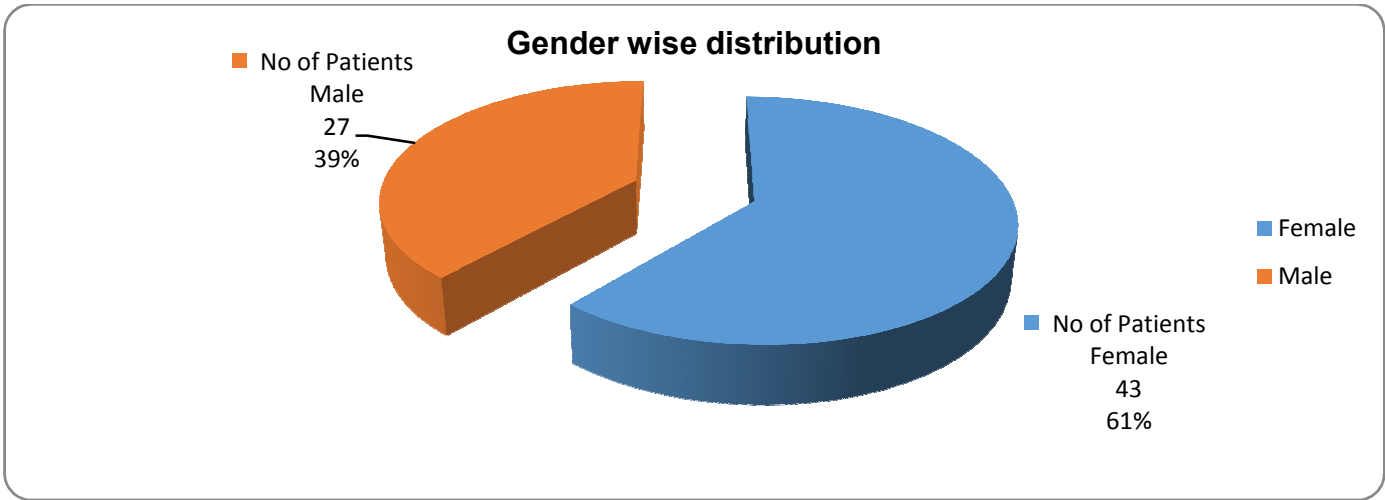
commonly involved. Analysis revealed a significant improvement in pain starting from 4th week. Success was defined as reduction of pain without re-intervention after a follow up of 6 months.

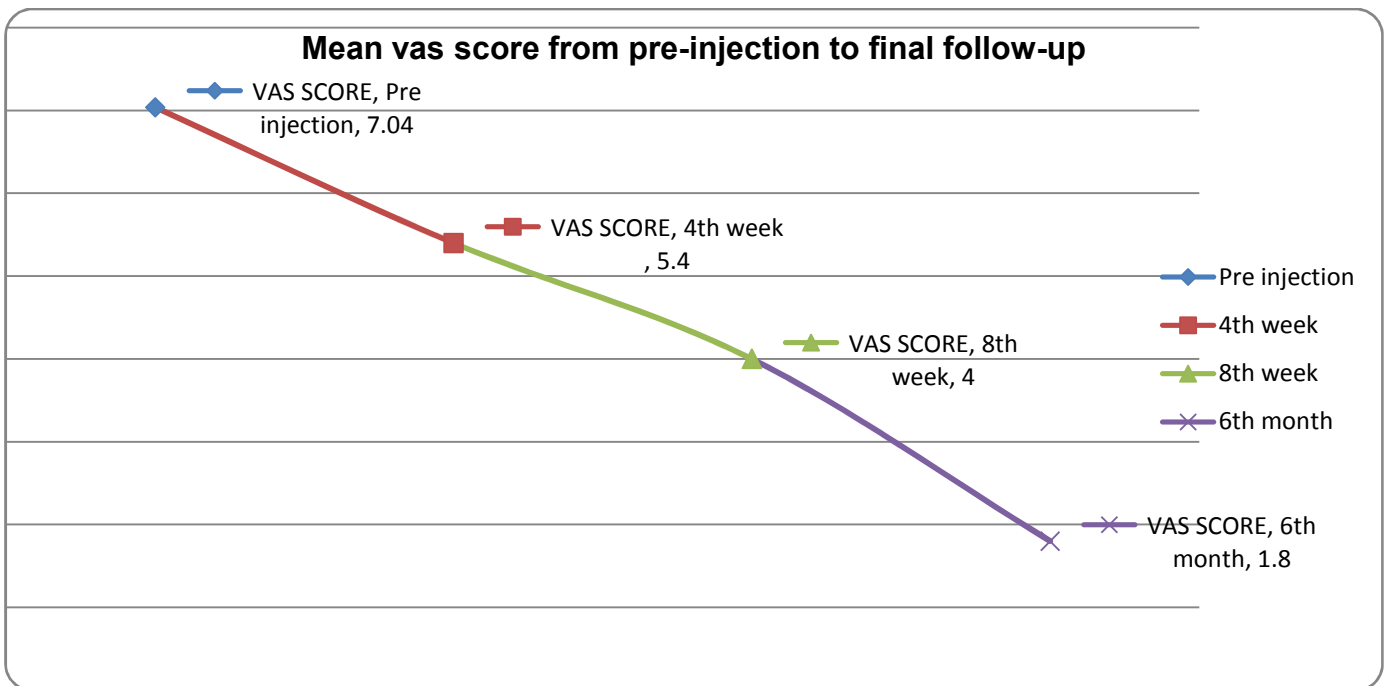
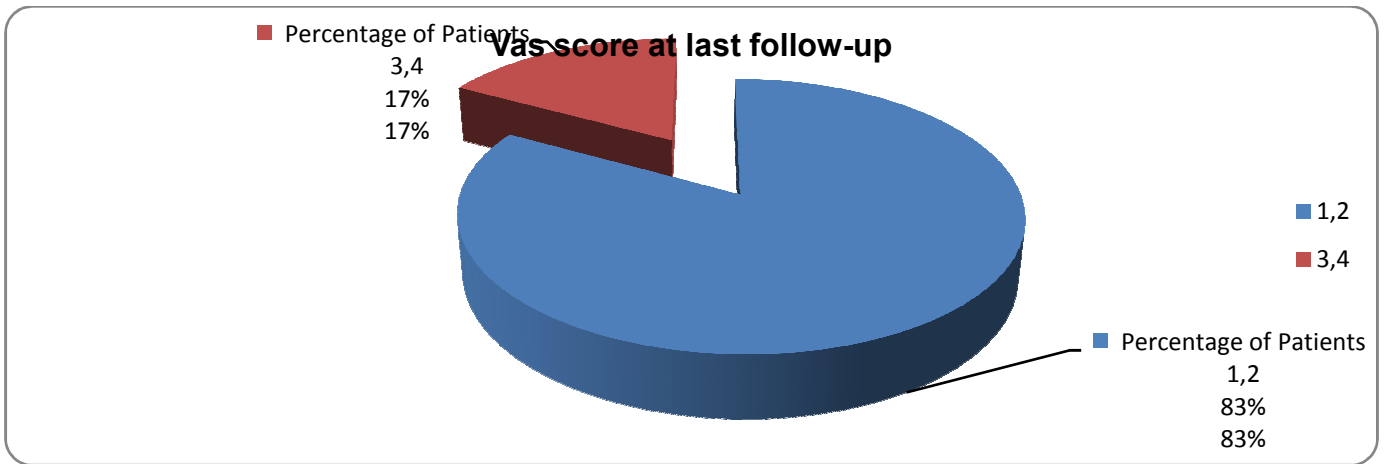
Side of Involvement



Occupation wise distribution







Discussion

Elbow epicondylar tendinosis is a common problem with many possible treatments. The number of overuse injuries is not exactly known, but in sports medicine, they account for 30 to 50% of all injuries⁽⁶⁾. Age-adjusted logistic regression analyses have shown that people who have worked for 25 to 35 years are more likely to develop tendinopathy⁽⁷⁾.

In our study maximum patients were in fourth decade. The mean age group was 41.34 years. Nirschl RP et al⁽⁸⁾ in their study found tennis elbow predominance in fourth and fifth decade. Female predominance was

present as far as sex ratio of this tendinopathy was concerned with 43 females (61 %) having this pathology compared to 27 males (39 %). Karen Walker-Bone et al⁽⁹⁾ in their population based study on occupation and epicondylitis found mean age 45.6 years (range 24.6 - 66.3 years), and (55%) female. Tennis elbow was most commonly found in the people, who were mostly involved with repetitive forearm movements.

Association of this being common in housewives can be attributable since they are liable for various house hold activities which requires excessive use of forearm supinators and wrist extensors. Ciccotti MG,

Lombardo SJ⁽¹⁰⁾ stated that the cause of lateral epicondylitis is excessive, monotonous use of the wrist extensors and forearm supinators.

Double centrifugation method in our study for the preparation of PRP. AronGonshor⁽¹¹⁾ described two stage technique for processing PRP and revealed that the platelet concentration was 3 to 5 times the whole blood baseline, the concentration of the platelet derived growth factor (PDGF - AB) was above 500 % and tissue growth factor (TGF β 1) was also greater than 800 %. Pietrzak WS and EppleyBL⁽¹²⁾ used double centrifugation technique. The blood sample is drawn into a tube with anticoagulation factor and then the tube is spun in standard centrifuge cycles. The first spin (soft spin) will separate the red blood cells from the plasma that contains the platelets, white blood cells and clotting factors (Buffy coat). The second spin (hard spin) finely separates the platelet concentrate (PRP) from the platelet-poor plasma.

In our study Comparison of the mean VAS Score with each follow up showed decrease in mean VAS score at the 4th week of injection from 8 to 5.3, at the 8th week of injection the mean VAS score was 4, and at the last follow up at the 6th month of injection the mean vas score was 1.84 Mishra and Pavelko⁽¹³⁾ eight weeks post injection the PRP patients reported 60% improvement in visual analogue scale (VAS) pain score. At six months post injection, cases reported 81% improvement in their VAS pain score and at final follow-up patients reported 93% reduction in their VAS pain score. Jonathan T. Finnoff et al. ⁽¹⁴⁾ found the mean pain improvements of 58%. Ragab EM, Othman AM⁽¹⁵⁾ in their study found the VAS to improve from 9.1 to 1.6. These findings were found to be comparable with other authors who compared the VAS scores. At

the final follow up at sixth months post injection, our cases reported 74 % improvement in their VAS pain score in our study.

It was also concluded that lateral epicondylitis is more common in dominant hand (In our study 51 dominant side and 19 non dominant side) . Kevin Lutsky et al⁽¹⁶⁾ conducted a study to evaluate the effect of hand dominance on function in patients with Common hand disorders such as carpal tunnel syndrome, de Quervain's tenosynovitis , lateral epicondylitis , hand osteoarthritis and trigger finger affect the dominant and nondominant hands in roughly equivalent proportions, whereas Lateral Epicondylitis is more common on the dominant side.

Conclusion

The current investigation represents clinically based outcome study to evaluate the effectiveness of treating Chronic Lateral Epicondylitis (tennis elbow) with PRP injection. Our results suggest that this treatment may be an effective and safe treatment option for patients presenting with tennis elbow. We were also able to evaluate the association between multiple variables, including age, sex, occupation, and VAS score. There is low risk of infection as the whole procedure of platelet separation is done under aseptic conditions and PRP has antibacterial properties. None of our patients had incidence of infection.

The PRP is freshly prepared from patients own blood. There is no chance of adverse reaction as no foreign substance is injected. The time required for clinical improvement was also short with most of the patients showing significant improvement in VAS score within 4 weeks. As PRP can be prepared immediately at the point of care, this makes it simple and inexpensive procedure.

None of the patients reported to have recurrence of symptoms when followed up to 6 months of treatment. PRP injection is

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