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RESEARCH ARTICLE

EFFECTIVENESS OF AUTOLOGUS INJECTION PLATELET RICH PLASMA IN MANAGEMENT OF LATERAL EPICONDYLITIS AND TO MEASURE THE OUTCOMES IN A SHORT TERM FOLLOW UP

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Platelet Rich Plasma, Lateral Epicondylitis, VAS Score, DASH Score

Abstract

Introduction: An inflammatory disorder known as lateral epicondylitis develops where the common extensor tendon of the forearm originates over the lateral epicondyle. It is the most prevalent chronic, debilitating, and painful elbow condition. 1 to 3 percent of the overall population experiences symptoms.

Aim And Objectives: to assess the results of a brief follow-up study after a single dose of autologous platelet-rich plasma injection for the treatment of lateral epicondylitis.

Materials And Methods: This is a prospective study of about 25 patients includes 17 females and 8 males who were diagnosed as lateral epicondylitis. Platelet rich plasma group was injected with 3-4 ml platelet rich plasma, using a "peppering" technique in a clock wise manner to better cover the affected area of lateral epicondyle.

Results: All the relevant data were analysed. The average Visual Analogue Scale (VAS) and Disabilities of the Arm, Shoulder and Hand (DASH) scores of pre injection, 4th week, 8th week and 12th week post injection

Discussion: Currently, platelet rich plasma (PRP) is considered as the optimal biological component produced from autologous blood. In addition, platelet rich plasma has high antimicrobial potency and this property may prevent infections.

Conclusion: Pain and decreased functional activities in lateral epicondylitis are significantly improved by a single autologous platelet-rich plasma injection.

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Introduction:-

An inflammatory disorder known as lateral epicondylitis develops where the common extensor tendon of the forearm originates over the lateral epicondyle. It is the most prevalent chronic, debilitating, and painful elbow condition. 1 to 3 percent of the overall population experiences symptoms. It is typical in workers who often rotate their forearms, such as carpenters, laborers, software engineers, and weavers. An equal number of men and women get lateral epicondylitis, which typically develops between the ages of 35 and 50. Most frequently, the dominant upper limb is affected [1,2, 3]. It is unclear what causes lateral epicondylitis in its real form. Currently, it is believed that overuse and abnormal microvascular reactions cause a degenerative process to occur at the common extensor tendon origin of the wrist and fingers. [4,5,6]. Nirschl noted that the extensor carpi radialis brevis (ECRB) tendon's origin was the site of the primary disease. However, occasionally the deep surface of the extensor carpi radialis longus (ECRL) and the anteromedial border of the extensor digitorum communis (EDC) may also be affected.

Rest, activity modification, non-steroidal anti-inflammatory drugs, conventional force braces, massage, physiotherapy, laser treatment, extracorporeal shockwave treatment, acupuncture, ultrasound treatment, and botulinum toxin type A injection are just a few of the recommended treatment modalities for lateral epicondylitis. In the previous, corticosteroid injections were considered the best treatment for lateral epicondylitis. The autologous blood injection and different types of open and arthroscopic operative treatment are also advised for lateral epicondylitis [7,8,9,10,11]. Currently, platelet rich plasma (PRP) is regarded as the optimal biologically derived component from autologous blood. Upon activation, the platelet produces significant concentrations of transforming growth factor-beta (TGF- β), platelet derived growth factor (PDGF), fibroblast growth factor (FGF), vascular endothelial growth factor (VEGF), and cytokines near the injection site. At the cellular level, these growth factors released from platelet rich plasma aid in the healing of wounds, tendons, and bones [12]. Furthermore, platelet rich plasma has strong antibacterial properties, which may help to avoid infections [13].

Aim And Objectives:-

To assess the results of a brief follow-up study after a single dose of autologous platelet-rich plasma injection for the treatment of lateral epicondylitis.

Materials And Methods:-

This is a prospective study of about 25 patients includes 17 females and 8 males who were diagnosed as lateral epicondylitis. The present study attempts to evaluate the effectiveness of platelet rich plasma injection as a treatment for lateral epicondylitis.

Inclusion criteria

longer than three months of pain over the lateral epicondyle, lateral elbow pain that is worst at the lateral epicondyle, and pain that is made worse by applying pressure to the lateral epicondyle and resisting wrist dorsiflexion.

Exclusion criteria

Rheumatoid arthritis, fibromyalgia, pain in the same upper limb's hand, shoulder or neck, uncontrolled diabetes and systemic hypertension, anticoagulant medication, elbow ulcers, steroid injections within the past three months.

Platelet Rich Plasma Preparation:

after explaining the procedure 40 cc venous blood was collected from cubital vein with the help of 18G needle. Blood was collected in 2 centrifuge tubes in equal amount (20 ml in each). PRP was prepared by two spin method by using centrifuge machine. Blood collected in two tubes was centrifuged at 2800 rpm for 10mins. Centrifugation gave three layers, upper layer composed of plasma platelets and some WBCs, intermediate layer or buffy coat composed of WBCs and bottom layer of RBCs. The upper layer volume platelet poor plasma was removed and the remaining volume of plasma rich in platelet was collected. The final product was 3 to 4 ml of plasma containing higher concentration of platelets. No exogenous factors were used for activation. The procedure was done on an outpatient basis. Once the exact location was determined by assessing the maximum tenderness point clinically, the patient was injected with a local anaesthetic drug (Lignocaine) under sterile technique. Platelet rich plasma group was injected with 3-4 ml platelet rich plasma, using a "peppering" technique in a clock wise manner to better cover the affected area of lateral epicondyle. The patient was then observed for 15 to 20 minutes and then discharged. After the injection, patient was allowed to follow our postinjection protocol. Since the patients may experience discomfort at the site of the injection for up to three days, they are advised to have ice fermentation over the injection site, limb elevation, activity modification and oral acetaminophen for pain relief.

Follow Up:

All the patients were followed up at 4th week, 8th week and 12th week of post injection. One patient skipped the last follow-up appointment. Pain levels were measured at the follow-up visit using the VAS and DASH scores, and the results were compared to those obtained prior to the injection. The reduction in pain from the level before the injection served as the benchmark for the final result. Patients were monitored for post injections complications.

Outcome Measures:

The Patient's clinical outcome is measured by using two self-report questionnaires at each review period. 1. The Disabilities of the Arm, Shoulder and Hand (DASH) outcome score. 2. Visual analog scale (VAS) score to assess pain and functional outcome in lateral epicondylitis.

Analysis Of Data-

patients between the above-mentioned period, 25 cases of lateral epicondylitis who met the above criteria were included for the study. There were 17 females with 14 right side lateral epicondylitis and 3 left side lateral epicondylitis and 8 males with 7 right side lateral epicondylitis and 1 left side lateral epicondylitis. The mean age was 44.3 years and the range was 30 to 67 years. The mean duration of symptom was 4.8 months.

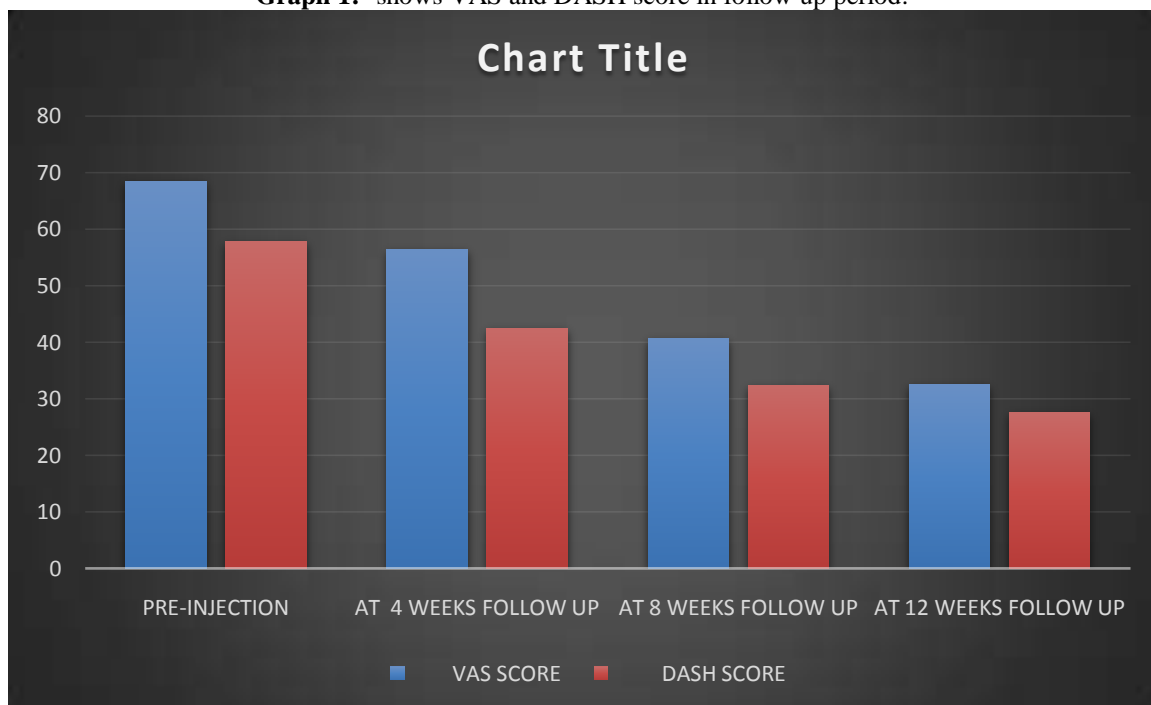
Results:-

All the relevant data were analysed. The average Visual Analogue Scale (VAS) and Disabilities of the Arm, Shoulder and Hand (DASH) scores of pre injection, 4th week, 8th week and 12th week post injection are shown in the below (table 1 and graph 1)

Table no 1:-

	VAS SCORE	DASH SCORE
PRE-INJECTION	68.5	57.9
AT 4 WEEKS FOLLOW UP	56.5	42.5
AT 8 WEEKS FOLLOW UP	40.7	32.4
AT 12 WEEKS FOLLOW UP	32.6	27.6

Graph 1:- shows VAS and DASH score in follow up period.



In this study, the visual analogue scale (VAS) score is decreased by 35.9 and the disabilities of the arm, shoulder and hand (DASH) score is decreased by 30.3 at 12 weeks.

Discussion:-

Lateral epicondylitis is an inflammatory condition at the origin of the extensor tendon of forearm muscles over the lateral epicondyle. It is the commonest chronic disabling painful condition of the elbow. It causes symptoms in 1% to 3% of the general population. Currently, platelet rich plasma (PRP) is considered as the optimal biological component produced from autologous blood. Since 1970, platelet rich plasma has been used and investigated. Upon activation, the platelet releases high concentrations of transforming growth factor-beta (TGF- β), platelet derived growth factors (PDGF), fibroblast growth factors (FGF), vascular endothelial growth factors (VEGF), and cytokines at the injection site. These growth factors are important for cell division, migration, chemotaxis, and angiogenesis. Serotonin, histamine, dopamine, calcium, and adenosine are just a few of the bioactive substances that are contained in the dense granules of platelets. These non-growth factors are crucial to the biological processes involved in

wound healing. A clot that includes fibronectin, fibrin, and vitronectin as well as other cell adhesion molecules is used to distribute the platelets in platelet rich plasma. These cell adhesion molecules encourage cell migration and enhance platelet rich plasma's biological activity. By serving as a scaffold or conductive matrix for cells to adhere and begin the healing process, the clot itself helps in wound healing [12]. In addition, platelet rich plasma has high antimicrobial potency and this property may prevent infections. There are a smaller number of studies regarding the benefits of platelet rich plasma injection therapy for lateral epicondylitis. Elbow pain and functional activity were the key outcome criteria taken into account. Long-term studies on the usefulness of platelet rich plasma are currently missing. This study shows three months follow up results using the same outcome parameters. It was established that platelet rich plasma injection is secure and simple in the Gosen et al. study that compared the efficiency of autologous platelet rich plasma injection to steroid injection therapy in lateral epicondylitis. In terms of functional impairment, the corticosteroid group first performed better before regressing to baseline, when compared to the platelet rich plasma group, symptoms gradually improved. Even after a year, there was a noticeable change in the reduction of pain and functional impairment following platelet rich plasma treatment. In this study the DASH score has declined from pre injection score of 57.9 to 42.5 at 4 weeks, 32.4 at 8 weeks and 27.6 at 12 weeks which is almost similar to the study by Gosen et al march 2011, where the pre injection DASH score is 54.3 which declines to 43.1 at 4 weeks, 31.2 at 12 weeks (14). In this study the VAS score has declined from the pre injection score of 68.5 to 56.5 at 4 weeks, 40.7 at 8 weeks and 32.6 at 12 weeks which is almost similar to the study by Gosen et al march 2011, where the pre-injection VAS score of 69.0 declines to 55.7 at 4 weeks, 45.1 at 8 weeks and 40.2 at 12 weeks. In this study with the results of three months follow up, the outcome after platelet rich plasma injection is maintained. A significant finding is that the patients had worse preinjection VAS scores and better after 12 weeks. This strengthens our conclusion that the platelet rich plasma injection is better. The VAS, DASH, PRTEE, and MAYO scores improved significantly over time following the injection of PRP, according to a study by Niemiec et al. Statistically significant differences ($P < .0001$) between the baseline and posttreatment values were reported at nearly every follow-up point for nearly all PROMs (16). In the Mishra and Pavelko research, the success rate was 93% in the platelet rich plasma group and 65% success rate for steroid group in their study (15). Out of 40 patients in this trial, one patient did not return for follow-up, and there were no significant post-procedure complications other than one patient who complained of paraesthesia at the injection site, which disappeared after 12 weeks.

Conclusion:-

Pain and decreased functional activities in lateral epicondylitis are significantly improved by a single autologous platelet-rich plasma injection. Without any major issues, these gains were sustained during our follow-up period. In order to assess the long-term effects of pain reduction and functional improvement in lateral epicondylitis, longer-term follow-ups with a larger patient population are required.

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