Original Article

# AUTOLOGOUS BLOOD INJECTION IN THE TREATMENT OF LATERAL EPICONDYLITIS

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**Objective:** To know the results of autologous blood injection in lateral epicondylitis. Out Patient Department of Peshawar Institute of Medical Sciences, Peshawar from March 2013 to Dec. 2013.

**Material and Methods:** It is a prospective descriptive study conducted on 66 patients with lateral epicondylitis, fulfilling the inclusion criteria. DASH (Disability of the Arm, Shoulder and Hand) score was used as primary outcome measure and Thomsen provocative test to elicit pain and Nirschl score to evaluate pain on function as secondary outcome were used before autologous blood injection and at 12 and 24 weeks after injection of autologous blood. VAS score was used to measure pain. 2ml of autologous venous blood mixed with 1 ml of lignocaine 2% solution and injected by introducing the needle into lateral epicondyle of humerous at site which is most tender by peppering technique. Patients were followed up at 2 weeks, 6 weeks, 12 weeks and 24 weeks interval. Patient DASH score, VAS pain score and Nirschl score was recorded before autologous injection and at 12 & 24 weeks post injection. P-value of < 0.05 deemed to indicate statistical significance and was calculated where applicable.

**Results:** Out of 83 patients 66 met the inclusion criteria. Mean age of the patients was 39.68 years +12.77. 32 of these patients were females and 34 were males. Dominant elbow was involved in 42 patients. Mean duration of symptoms was 8.9+3.2 months. During follow up 10 patients were lost (6 females and 4 males). DASH score of patients improved from 86 to 64 at 12 weeks and to 49 at 24 weeks (P value <0.0001). Mean VAS improved from 7.63 to 3.89 and 1.77 respectively at 12 and 24 week follow up (P value <0.0001). Nirschl score of the patients receiving autologous blood injection improved to 3.69 and 1.66 at 12 and 24 weeks follow up respectively from 5.98 score of pre-autologous blood injection (P value <0.0001).

**Conclusion:** Autologous blood injection has shown improvement in pain and physical activity and provide acceptable short to long term results.

**Key words:** Autologous blood injection, Lateral epicondylitis, Visual Analogue Scale, DASH, Nirschl.

## Introduction

Lateral epicondylitis is an important common musculosekletal problem of upper extremity with incidence of 4-7 results per1000 per annum usually occurring equally in both genders especially with impact of athletes and workers.[1,2,3] Most common symptom of presentation is pain on lateral aspect of elbow with increase in intensity of grasping and dorsi flexion of wrist against resistance.[1] it is thoght to result from degeneration of common extensor origin especially origin of extensor carpi radial brevis.[1,3] In older patients it is usually result of repeated minor trauma that is unrecognized and occurs with occupation related physical activities whereas similar trauma in sports activities is cause for lateral epicondylitis in younger patients.[1,4,5] pathologically it characterize buy proliferation of fibroblast, vascular hyperplasia and disorganization of collagen fiber with no evidence of inflamation.[6,7,8] Conventional treatment options for lateral epicondylitis include rest, physical therapy, lateral epicondylitis brace, non-steroidal anti-inflammatory drugs (NSAIDS), corticosteroid injections, laser therapy, extra corporeal shock wave therapy.[1,2] Evaluation of these non-surgical therapies have shown that none has consistent effects.[2,9,10,11] Those patients in whom these therapies don't work have option of surgical treatment which included open, percutaneous or arthroscopic debridement of the involved area close to epicondylar region having good long term results.[1,12]

In recent years scientific knowledge has revealed that blood contents especially platelets are release few proteins which attract macrophages, mesenchymal stem cells and osteoblasts which along with removing necrotic tissue also increase tissue regeneration and healing[13]. Autologous whole blood injection has shown promising results for lateral epicondylitis and was first described by Edwards and Calandruccio.[2,14]

It delivers growth factors in blood to injury area which then act as mediators and catalyst for promoting tissue repair and regeneration[6]. It is shown

that there is marked betterment in pain and function with use of autologous blood injection[3]. Studies comparing autologous blood injection with corticosteroid injection has shown better outcome in former group[15].

## Materials and Methods

Sixty six patients diagnosed clinically with lateral epicondylitis and fulfilling the inclusion criteria (Table 1) in Out Patient Department of Orthopaedic Department, Peshawar Institute of Medical Sciences, Hayatabad, Peshawar, from March 2013 to December 2013 were included in the study after getting approval from head of department. DASH (Disability of the Arm, Shoulder and Hand) score was used as primary outcome measure. "The DASH is a 30-item self-report questionnaire designed to measure physical function items16." "The DASH is designed to measure physical disability and symptoms in a heterogeneous population that includes both males and females; people who place low, moderate, or high demands on their upper limbs during their daily lives (work, leisure, self-care); and people with a variety of upper-limb disorders16." At least 27 of the 30 items must be completed for scoring. Currently the literature holds 12.7 point change to be statistically significant at 95% confidence interval17 and is called Minimum Detectable Change (MDC) while change of 15 points is considered clinically significant and is called Minimum clinically important difference (MCID)17. Thomsen provocative test to elicit pain and Nirschl score (Table 2) to evaluate pain on function were used before autologous blood injection and at 24 weeks after injection of autologous blood as secondary outcome measure. The Thomsen provocation test was performed with the shoulder flexed at 600, the elbow extended, the forearm pronated, and the wrist extended to 300. Pressure was applied on the dorsum of the hand. The test was performed 3 times, with the patient recording the pain on a 100-mm visual analog scale (VAS) with 0 indicating no pain and 10 indicating maximum pain. The mean of the 3 measurements was recorded. Similarly Nirschl score was calculated before and 24 weeks after injection. At follow-up, a 50% decrease in the Thomsen test VAS value was considered a successful result.

2ml of venous blood was drawn from ipsilateral or contra lateral upper arm by following standard protocol of venesection and was mixed with 1 ml of lignocaine 2% solution. By observing all antiseptic techniques this was injected by introducing the needle into lateral epicondyle of humerous at site which is most tender. A "peppering" technique was used for injection which means to insert the needle, inject some content (autologous blood and 2% lignocaine) into area, then withdrawing the needle but not emerging from skin and after redirecting slightly reinserting again and injecting the content. Patients are advised to avoid those activities which require repetitive movements of wrist and elbow during first 3 weeks after injection. As soon as the pain permits, gentle passive stretching exercises of extensor muscles of forearm started. Patients were followed up at 2 weeks, 6 weeks, 12 weeks and 24 weeks interval. Patient biodata was obtained before injecting autologous blood and DASH score, VAS pain score and Nirschl score was recorded before autologous injection and at 24 weeks post injection. Statistical analyses were performed with the Statistical Package for the Social Sciences (SPSS 16.0; SPSS, Inc, Chicago, Illinois). P-value of $< 0.05$ deemed to indicate statistical significance and was calculated where applicable.

## Results

66 patient met the inclusion criteria. Mean age of the patients was 39.68 years +12.77. 32 (48.48%) of these patients were females and 34 (51.52%) were males. Dominant elbow was involved in 42 (63.63%) patients as compared to 24 (35.37%) in whom non-dominant elbow was involved. Mean duration of symptoms of lateral epicondylitis was 8.9+3.2 months.

All patients received the autologous blood injection according to protocol. During follow up 10 patients were lost (6 females and 4 males). Pre and post autologous blood injection mean DASH score of 56 patients who completed the follow up is given in **Table 1.**

Currently the literature holds 12.7 point change to be statistically significant at 95% confidence interval17 and is called Minimum Detectable Change (MDC) while change of 15 points is considered clinically significant and is called Minimum clinically important difference (MCID).[17]

In our study there was a change of 22 points and 37 points at 12 and 24 weeks follow up respectively which means it is statistically as well as clinically significant. Similarly pre and post autologous blood injection mean VAS for pain in patients who completed the follow up is given in **Table 1.** Nirschl score of the patients receiving autologous blood injection is given in **Table** 1 both pre and post injection.

**Table-1:**

| Disability Of Arm, Shoulder And Hand (dash) Score | Mean Vaule+SD | P-value |
|---|---|---|
| Pre-autologous blood injection DASH score | 86+19.12 | |
| 12 week post autologous blood injection DASH score | 64+19.32 | < 0.0001 |
| Pre-autologous blood injection DASH score | 86+19.12 | |
| 24 week post autologous blood injection DASH score | 49+18.12 | < 0.0001 |
| **Pain Assessment** | | |
| Pre-autologous blood injection pain score | 7.63+1.83 | |
| 12 week post autologous blood injection pain score | 3.89+2.22 | < 0.0001 |
| Pre-autologous blood injection NIRSCHL score | 7.63+1.83 | |
| 24 week post autologous blood injection pain score | 1.77+1.01 | < 0.0001 |
| **Nirschl Score** | | |
| Pre-autologous blood injection NIRSCHL score | 5.98+2.01 | |
| 12 week post autologous blood injection NIRSCHL score | 3.69+2.13 | < 0.0001 |
| Pre-autologous blood injection NIRSCHL score | 86+19.12 | |
| 24 week post autologous blood injection NIRSCHL score | 48+18.12 | < 0.0001 |

## Discussion

Lateral epicondylitis is thought to be having multifactorial pathophysiology and etiology with aging, chemical, vascular, hormonal factors playing their part.[1] Varieties of injections are used for purpose of treatment, steroids being most common of them[3] which is thought to be causing hemorrhage in tissue planes[18] and also influences degenerative and reparative components in this condition.[1] Autologous blood injection is also used in tendinopathies including lateral epicondylitis and showing comparable results with corticosteroid injections[3]. Aim of autologous blood injection is to deliver the growth factors at injury site directly and hence augmenting natural healing process and tendon repair[6]. Few studies have shown that autologous blood injection has improved the symptoms in cases that were refractory to steroids.[6]

Pain and limitation of daily physical activities are two important symptoms of lateral epicondylitis for which patient seeks medical attention and treatments are evaluated by improvement in these symptoms. Many treatment approaches are utilized to have improvements in symptom of pain and physical activity ranging from physiotherapy, rest, NSAIDs, steroid injections, autologous blood injection, plasma rich platelets to surgery.[1,2,3,6,13] In our study the patients VAS score for pain after autologous blood injection has improved significantly (P value <0.0001) from 7.63 to 1.77. Wolf JM et al[3] in his comparative study had improvement of VAS pain score from 5 to 1 in autologous blood injection group. Other studies around the globe has also found comparable results with improvement in VAS pain score with autologous blood injection.[1,2,6]

Limitation in day to day activity and not able to do the daily required jobs freely is troublesome in lateral epicondylitis. Nirschl score and DASH score are used to range the amount of disability caused and re-evaluation of these scores after treatment of conditiongives us good indicator of showing if improvement has achieved with particular management plan. In our study both Nirschl and DASH score showed significant improvement at 12 and 24 week follow up ( P value <0.0001). Connell DA et[19] and Edward et al[20] has also achieved improvement in Nirschl score with autologous blood injection Connell DA used local anaesthetic before dry needling and injecting autologous blood injection in contrast to our of Edward's study in which we mixed local anaesthetic with autologous blood injection and injected it to proper place. The DASH score in our study had change of 22 and 37 points at 12 and 24 week follow up respectively after autologous blood injection which according to Beaton DE[17] is significant both statistically and clinically with 95% confidence interval

DASH score improvement in autologous blood injection group of Wolf JM[3] comparative study was only statistically significant (>12.7 point change). Lack of control group is one limitation of our study and recommends a comparative study of autologous blood injection with steroid and other treatment modalities of lateral epicondylitis augment our findings.

## Conclusion

Treatment with autologous blood injection has shown improvement in pain and physical activity and has advantage of lower cost and no requirement of additional equipment while provide acceptable short to long term results.

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