CHRONIC TENNIS ELBOW;
OUTCOME OF AUTOLOGOUS BLOOD INJECTIONS FOR THE TREATMENT

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ABSTRACT… Objectives: To evaluate the results of autologous blood injection as a treatment for chronic tennis elbow (Lateral Epicondylitis). **Study Design:** Descriptive case- series. **Setting and Duration:** Orthopaedic Surgery Unit Mardan Medical Complex Teaching hospital Bacha Khan Medical College Mardan KPK, from April 2010 to June 2011. **Methodology:** A total of 22 patients with tennis elbow (lateral epicondylitis) were injected with 2 mL of autologous blood under the extensor carpi radialis brevis in the Out-Patient Department (OPD). Patients rated their pain on a Visual Analogue Scale(VAS) scale of 0 to 10 with 0 representing no pain and 10 the worst pain they had ever experienced, and categorized themselves according to Nirschl score(1-7). After the procedure pain rating and Nirschl score were recorded every 3rd week for a minimum of 6 months. If pain relief was not relieved entirely 6 weeks after the autologous blood injection a repeat injection was offered to the patient. **Results:** Seventeen patients (77.2%) received one injection of autologous blood and had resulted in lowering their mean pre-injection pain score and Nirschl sore of 6.2 and 6 to 0.1 and 1.1 post-injection respectively. Five patients (22.7%) received two injections and their average pre-injection pain score of 6.8 and Nirschl score of 6.2 were lowered to 0.2 and 1 respectively. **Conclusions:** Autolgous blood injection is an effective way to treat patients of chronic tennis elbow as demonstrated by decrease in pain and fall in Nirschl score and we therefore recommend it as a first line treatment for chronic tennis elbow.

Key words: Tennis elbow, Lateral epicondylitis, Autologous blood

INTRODUCTION

Tennis elbow (Lateral epicondylitis) is one of the most common overuse syndromes seen in primary care, with an annual incidence of 1 to 3 percent; the condition affects men and women equally[1]. It was first reported in the literature in 1873 by Runge and later in 1896 by Bernhardt[2]. It occurs more frequently in non-athletes, with a peak incidence in the early fifth decades on a nearly equal gender incidence[3]. Histopathological findings indicate that tennis elbow is a degenerative condition, called tendinosis, of the common extensor tendon, with the extensor carpi radialis brevis tendon more commonly implicated as the primary location of tendinosis[4]. Non-operative treatment is successful in 90% of patients with tennis elbow[3]. Non-surgical treatment consists of activity modification, use of brace, strengthening exercise and occasionally steroid injections. Although symptoms resolve, in most patients with these treatment modalities, some patients will have prolonged pain and dysfunction. Different techniques are described in literature to treat these refractory cases viz. surgical debridement of ECRB,[5] percutaneous release,[6] arthroscopic debridement[7,8] extracorporeal shock wave[9,10,11,12] laser treatment[13] and Botulinum toxin injection[14]. Most nonsurgical treatments for lateral epicondylitis have focused on suppressing an inflammatory process that does not actually exist in conditions of tendinosis. An injection of autologous blood might provide the necessary cellular and humoral mediators to induce a healing cascade[15].

There are very few studies done to evaluate injection of autologus blood for lateral epicondylitis as treatment modality. Autologous blood was selected as the medium for injection in our study because.

(1) Its application is minimally traumatic.
(2) It has a reduced risk for immune-mediated rejection, skin atrophy and tendon tears associated with corticosteroid injection.
(3) It is simple to acquire and prepare, easy to carry out as outpatient procedure and (4) it is inexpensive.

SUBJECTS AND METHODS

In this study, we recruited a total of 22 consecutive patients with tennis elbow who attended the Outpatient Department (OPD) of Mardan Medical Complex Teaching Hospital Bacha Khan Medical College Mardan KPK from April 2010 to June 2011. Patients of all ages and gender with unilateral tennis elbow of more than 6 weeks duration were included in the study. All these patients had tenderness elicited just distal and anterior to the lateral epicondyle and pain with resistant wrist extension with elbow in full extension. Exclusion criteria included patients previously treated with surgery for lateral epicondylitis and patients receiving steroid injections within 3 months before blood injections. Coexisting pathology i.e. rheumatoid arthritis of elbow, bursitis, cervical radiculitis and patients with previous trauma around elbow were also excluded from the study.

Informed written consent was obtained from all patients participating in this study. The rationale was explained in accordance with the principles laid down by the Ethics Committee Mardan Medical Complex Teaching hospital. Relevant history, clinical examination and X-ray elbow AP & lateral view was taken in all the included patients. Patients rated their pain on Visual Analogue Scale (VAS) of 0 to 10 with 0 representing no pain and 10 the worst pain they had ever experienced, and categorized themselves according to Nirschl staging 1-7 (table No.1)[16] before the treatment was commenced.

In Out-Patient Department (OPD), two milliliters of autologous blood were drawn from the ipsilateral dorsal vein of the hand. The needle was then introduced proximal to the lateral epicondyle along the supracondylar ridge and gently advanced into the undersurface of the extensor carpi radialis brevis while infusing the blood extra-articularly. After the blood injections a triangular sling was prescribed for one week and patient advised against heavy manual work for three weeks. Nonsteroidal anti-inflammatory medications were withheld throughout the duration of the study. After the procedure pain rating and Nirschl score was recorded every 3rd weekly. If pain relief was not relieved entirely 6 weeks after the autologous blood injection a repeat injection was offered to the patient. The identical protocol was repeated. This cycle continued until patients either were satisfied with their response to treatment or declined another injection. All patients were followed-up for a minimum of 6 months post injection.

The data was analyzed using SPSS version11. Mean, Mode, Median, Percentages, Frequencies and ratios were calculated where necessary. No statistical test was applied because the study design was descriptive. The data was presented in tables and graphs where necessary.

Table-I. Nirschl Score

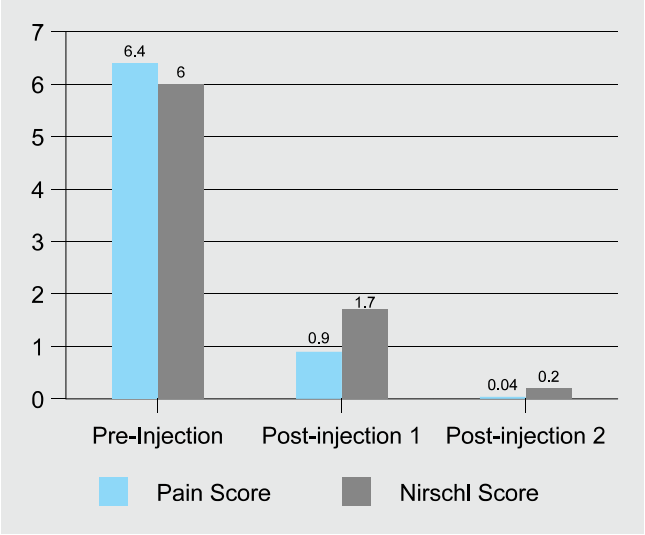
Phase 1	Mild pain with exercise; resolves within 24 h
Phase 2	Pain after exercise; exceeds 48 h
Phase 3	Pain with exercise; does not alter activity
Phase 4	Pain with exercise; alters activity
Phase 5	Pain with heavy activities of daily living
Phase 6	Pain with light activities of daily living; intermittent pain at rest
Phase 7	Constant pain at rest; disrupts sleep

RESULTS

A total of 22 patients with mean age 45.2, median 45 and mode 35 were included in the study. Of the 22 patients enrolled, 10 men (45.4%) with a mean age of 43.3years (range, 35-58y) and 12 women (54.55%) with a mean age of 46.9 years (range, 32-63y) had lateral epicondylitis involving 16(72.7 %) dominant and 6(27.2%) non-dominant extremities. Sixteen patients (72.7 %) had not received any steroid injections before being enrolled in the study. Four patients (18.1%) had received one steroid injection while two patients (11.7%) had received two steroid injections.The pre and post-injection Pain score and Nirschl score of all the patients included in the study is shown in Fig. 1. Seventeen patients (77.2%) received one injection of autologous blood and has resulted in lowering their mean pain score and Nirschl sore of 6.2 and 6 pre-injection to 0.1 and 1.1 post-injection respectively. The maximum relief was achieved on an average of 2.7 weeks. Five patients (22.7%) received two injections and their average pre-injection pain score of 6.8 and Nirschl score of 6.2 were lowered to 0.2 and 1 respectively .The maximum relief

was achieved on an average of 3.5 weeks in these patients. All the 22 patients were followed-up for a minimum of six months post- injection. There was no gross difference in gender response to autologous blood injection. Mean pre – injection pain score in males was 6.6 against a mean score of 6.2 in the females which improved to 0.6 to 1.2 respectively. The Nirschl score in females improved from a pre-injection mean of 5.9 to 1.8 at the final follow up.

Fig. 1. Mean pain and Nirschl scores of all the patients enrolled in the study before and after autologous blood injections.



While in males it improved from 6.3 to 1.7.The pain scores and Nirschl score also did not differ significantly between patient receiving single injection and those who received second injection after failure to achieve desired response from the first injection No patients received a third injection. All patients maintained their maximal benefit throughout the course of their follow-up evaluation. No patient reported worsening or recurrence of pain. No infection, reflex sympathetic dystrophy, elbow flexion contracture, or other untoward effects occurred. Pain after autologous blood administration was variable but most patients reported it to be comparable with previous steroid injections they had received before enrolling in the study.

DISCUSSION

Autologous blood injection for recalcitrant or refractory tennis elbow is based on the histopathological observation that, tennis elbow is not an inflammatory condition, but a fibroblastic and vascular response called angiofibroblastic degeneration more commonly known as tendinosis. This is characterized by invasion of blood vessels, fibroblasts and lymphatics into the symptomatic area of the extensor carpi radialis brevis[17]. The injection of autologous blood is thought to provide the necessary cellular and humoral mediators to induce a healing cascade[15].

In our study seventeen patients (77.2%) received one injection of autologous blood and had resulted in lowering their mean pre-injection pain score and Nirschl sore of 6.2 and 6 to 0.1 and 1.1 post-injection respectively. Five patients (22.7%) received two injections and their average pre-injection pain score of 6.8 and Nirschl score of 6.2 were lowered to 0.2 and 1 respectively.

This is similar to study by Edwards and Calandruccio[15] who showed that 22/28 patients (79%) responded to autologous blood injections with average Nirschl Scores decreasing from 6.5 to 2.0 with a mean follow-up of 9.5 months and were relieved completely of pain even during strenuous activity. But their technique differed from ours in that they mixed the autologous blood with local anaesthetic before injecting along the undersurface of the extensor carpi radialis brevis tendon. In contrast, we injected blood without local anaesthetic.

Connell and Ali[18] reported significant reductions for Nirschl scores after autoogous injection, which decreased from a median (inter-quartile range) pre-procedure score of 6 (6-7), to 4 (2-5) at 4 weeks ($p<0.001$), and to 0 (0-1) at 6 months ($p<0.001$). Similarly, significant reductions were reported for VAS scores from a median (inter-quartile range) pre-procedure score of 9 (8-10), to 6 (3-8) at 4 weeks ($p<0.001$), and to 0 (0-1) at 6 months ($p<0.001$).This study however had used ultrasound guided injection of autologos blood. These authors concluded that autologous blood injection is a primary technique for the treatment of lateral epicondylitis and Sonography can be used to guide injections and monitor changes to the common extensor origin.. In a single-blind, randomized, clinical study,

Kazemi and colleagues[19] compared local corticosteroid with autologous blood injections for the short-term treatment of lateral elbow tendinopathy. The authors concluded that autologous blood was more effective in short-term than the corticosteroid injection.

Instead of autologous blood Mishra and Pavelko[20] injected platelet rich plasma for chronic elbow tendinosis and at a final follow-up of 12-38 months, patients reported 93% reduction in pain compared with the pre injection status. The idea is fascinating though, may not find much audience in our setup considering the difficulty in procuring fresh frozen plasma on an out patient basis. Moreover the mechanism of action and the final outcome may not differ much.

Our results have been good and those patients who have not responded to conservative therapy have returned to their occupation and hobbies. This study thus offers encouraging results of an alternative treatment that addresses the pathophysiology of lateral epicondylitis that has failed traditional nonsurgical modalities. However we feel that with a larger case series, a longer follow up and refinement of the procedure a fair conclusion can be drawn with regard to the efficacy and otherwise of this treatment modality.

CONCLUSIONS

Autolgous blood injection is an effective way to treat patients of chronic tennis elbow as demonstrated by decrease in pain and fall in Nirschl score reported by our study and we therefore recommend it as a first line treatment for chronic tennis elbow. The findings of this small study need to be validated by further investigation with larger number of subjects and longer follow-up.

REFERENCES

1. Allander E. **Prevalence, incidence, and remission rates of some common rheumatic diseases or syndromes.** Scand J Rheumatol.1974;3:145–53.
2. Osgood RB. **Radiohumeral bursitis, epicondylitis, epicondylalyia(tennis elbow).** Arch Surg 1992;4:420-433.
3. Christian CA, **In Campbell's Operative Orthopaedics.** S. Terry Canale (Ed). 9th ed. Mosby. St.Louis, Missouri 1998, vol II;1321-24.
4. Fedorczyk JM. **Tennis elbow: blending basic science with clinical practise.** J Hand Ther. 2006;19(2):146-53.
5. Nirschl RP, Pettrone FA. **Tennis elbow: the surgical treatment of lateral epicondylitis.** J. Bone Joint Surg. Am 1979; 61:832-839.
6. Baumgard SH, Schwartz DR. **Percutaneous release of the epicondylar muscles for humeral epicondylitis.** Am J. Sport Med. 1982; 10:233-236.
7. Baker CL. Jr. Murphy KP, Gottlob CA, Curd DT. **Arthroscopic classification and treatment of lateral epicondylitis: two year clinical results.** J. Shoulder Elbow Surg. 2000; 9:475-482.
8. Owens BD, Murphy KP, Kuklo TR. **Arthroscopic release for lateral epicondylitis.** Arthroscopy 2001; 17:582-587.
9. Jih-yang KO, han-shiang Chen, liang-mei Chen. **Treatment of lateral epicondylitis of the elbow with shock waves.** Clin Orthop 2001; 387:60-7.
10. Wang CJ, Chen HS. **Shock wave therapy for patients with lateral epicondylitis of the elbow.** Am J Sports Med 2002; 30:422-425.
11. Hakke M Konig IR, Decker T, et al. **Extracorporeal shock wave therapy in the treatment of lateral epicondylitis: a randomized multi-center trial.** J Bone Joint Surg 2002; 84A; 1982-1991.
12. Crowther MA, Bannister GC, Huma H, Rooker GD. **A prospective, randomized study to compare extracorporeal shock-wave therapy and injection of steroid for the treatment of tennis elbow.** J. Bone Joint Surg. 84B. 2002:678-679.
13. Grifka J, Boenke S, Kramer J. **Endoscopic therapy in epicondylitis radialis humeri.** Arthroscopy 1995; 11:743-748.
14. Keizer SB, Rutten HP, Pilot P, Morre HH, van Os JJ, Verburg. AD. **Botulinum toxin injection versus surgical treatment for tennis elbow: a randomized pilot study.** Clin Orthop 2002; 401:125-131.
15. Edwards SG, Calandruccio JH. **Autologous blood injections for refractory lateral epicondylitis.** J Hand Surg Am. 2003 ;28(2):272-8.
16. Nirshl RP. **Elbow tendinosis/tennis elbow.** Clin Sports

Med 1992;11:851-870.

17. Kraushaar BS, Nirschl RP. **Tendinosis of the elbow (tennis elbow): clinical and findings of histological, immunohistochemical, and electron microscopy studies.** J. Bone Joint Surg, 1999; 81A: 259-279.

18. Connell DA, Ali KE, Ahmad M, Lambert S, Corbett S, Curtis M. Skeletal Radiol. 2006;35(6):371-7.

19. Kazemi M, Azma K, Tavana B, et al. **Autologous blood versus corticosteroid local injection in the short-term treatment of lateral elbow tendinopathy: A randomized clinical trial of efficacy.** Am J Phys Med Rehabil. 2010;89(8):660-667.

20. Mishra A, Pavelko T. **Treatment of chronic elbow tendinosis with buffered platelet -rich plasma.** Am J Sports Med. 2006; 34: 1774-78.

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