ORIGINAL ARTICLE

Comparative Effectiveness of Autologous Blood and Steroid Injections in Patients with Lateral Epicondylitis

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Abstract

Background: Autologous blood and steroid injections have been used with different results. Some advocates autologous blood and some favors steroid injection for lateral epicondylitis.

Objective: To compare the effects of autologous blood with steroid injection in lateral epicondylitis.

Materials and Methods: This study was done at Department of Orthopedics and Trauma Unit, Khyber Teaching Hospital, Peshawar from December 2012 to December 2013. Patients were randomized into 2 groups; autologous blood injection (Group A) and steroid injection (Group B) each comprising of 39 patients to compare the effectiveness of both modalities of improvement in treatment for at least one grade of pain on Visual Analogue Scale at 6 weeks follow up. Data was analyzed by SPSS version10.0. Fisher's test/ T test was used to compare efficacy keeping p value $\leq$ 0.05 as significant.

Results: In Group A & B, there were 15 (38.46%) and 13 (33.33%) males and 20 (61.54%) and 26 (66.67%) females respectively ((p= 0.8137) and mean ages were 33.61 years $\pm$ 7.56SD and 33.61 years $\pm$ 11.65SD respectively ((p=1.0000)). Effectiveness of autologous blood injection and steroid injection was 32 (82.05%) and 20 (21.58%) respectively (p value = 0.0082). Gender (p=1.0000), age (p=0.763) and duration of symptoms (p=0.810) of patients were not significantly affecting the effectiveness.

Conclusion: We concluded that autologous blood injection is effective than steroid injection in lateral epicondylitis.

Key words: Lateral Epicondylitis, Autologous blood and Steroid injection.

Introduction

Lateral epicondylitis is a painful condition[1]. Its effects males and females equally and commonly affected age group is 35 to 50 years[2]. In general population the prevalence of lateral epicondylitis is approximately 1.0-1.3% in men and 1.1-4.0% in women and the incidence per year per 100 subjects has been estimated at 0.3-1.1 for tennis elbow. Lateral epcondylitis is also associated with repeated forceful activities and awkward posture of the limb or elbow[3].

This is not an inflammatory condition and the word "itis" is a misnomer and in general clinicians using the preferred name "tennis elbow." Diagnosis is based on clinical presentation and can be excluded other coexisting elbow joint pathologies, imaging is rarely needed. The clinical features are normal elbow range of motion, tenderness at the lateral epicondyle [4].

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Evidence based literature has not reported a single treatment modality and the treatment options are to wait and watch, modify activity followed by physical therapy, orthosis, oral and topical anti-inflammatory drugs, steroid injection, platelet-rich plasma, botulinum toxin, extracorporeal shock wave therapy, laser irradiation, and arthroscopic and open surgical intervention have been described[5]. Conservative treatment is also successful and the frequency of operative intervention is relatively low[6].

Comparison between autologous blood (AB) and corticosteroid (CS) injections for lateral epicondylitis has controversies. A comparative study has shown that at 4 weeks follow-up, corticosteroid injections has given 60.5% success rate while autologous blood injection has given 28.3% success rate in terms of improvement in upper extremity functions and pain[7]. On the other hand a study has shown superiority of autologous blood injection over corticosteroid injection at 4 weeks for severity of pain on visual analogue score. In the AB group the pain on Visual Analogue Scale improved from 2.7 to 0.9 while in CS it was from 4.5 to 2.5 (p = 0.001) [8].

This study will help delineate the best course of management of LE in our population and the aim of the study was to compare the effectiveness of

autologous blood and steroid injections in patients with lateral epicondylitis.

Material and Methods

This study was carried out during the period of 1 year at Orthopaedics and Trauma unit Khyber Teaching Hospital, Peshawar, on 39 patients in each group from December 2012 to December 2103. The inclusion criteria were; all patients of either gender between 20 to 70 years of age with lateral epicondylitis with moderate to severe pain. The patients excluded were; patients with bilateral elbow symptoms, who had prior surgery of elbow, dislocation, tendon ruptures, fractures, cervical, shoulder and wrist pathology, local skin infection or osteomyelitis, those who had received steroid injections within three months or treated by surgery for lateral epicondylitis.

With the permission from the hospitals research and ethical committee, patients meeting the inclusion criteria were included in the study through OPD of orthopedic department. Lateral epicondylitis was diagnosis as pain on outer (Lateral) part of the elbow (on history) with a point of maximum tenderness (on clinical examination), present for less than 6 weeks and pain becoming worse by wrist extension against resistance in a pronated hand (Cozen's Test).

The purpose, benefits and drawbacks of the study were explained to the patient. Patients were randomly allocated in groups A and B was receiving autologous blood and steroid injection respectively. A detailed history, physical and systemic examination was done. For injection infiltration, the patients were placed in a supine position with affected arm resting at the side of the body and the elbow flexed up to 45^0 with wrist pronation. By gentle palpation tender point of the epicondyle was identified and needle was inserted at 90^0 levels of the bone axis and then 1 to 2 mm retrieved back and infiltration was done. In group A, 2 ml autologous blood taken from contralateral upper limb through median cubital vein and infiltrated at the lateral epicondyl while in Group B, 2ml of Xylocaine 2% was mixed with 1 ml of Injection Depomedrol containing 40mg of Methylprednisolone Acetate and was infiltrated under aseptic condition. After injection for hemodynamic stability, the patients of both groups were kept for 30 minutes under observation in the OPD and then the patients were allowed to go home. In case of a female patient, the procedure was carried out in the presence of a female attendant/charge nurse. Patients were re assessed at 6 weeks follow up to determine intervention effectiveness in terms of improvement in at least one grade of pain on Visual Analogue Scale. Pain was assessed by Visual Analogue Scale (VAS) as: Grade 0: No pain (VAS), Grade 1: Mild = 1 – 3 (VAS), Grade 2: Moderate = 4 – 7 (VAS), Grade 3: Severe = 8 – 10 (VAS).

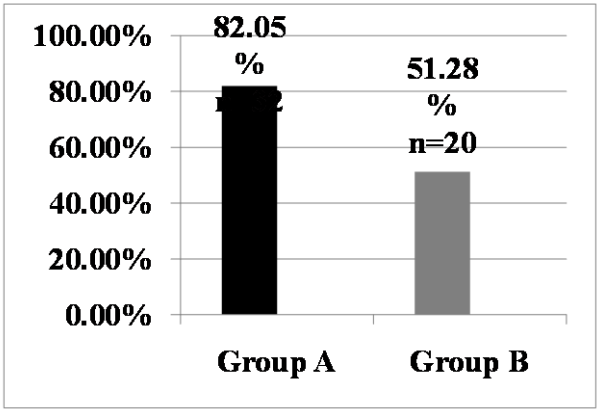
All the above-mentioned information including name, age, sex, address was recorded in a predesigned proforma. Exclusion criteria were followed strictly to control confounding variables and bias in the study results.

Data was analyzed with the help of SPSS version10.0. The demographic variables were gender, age in years, age grouping & duration of symptoms and the research variables were Grade of Pain before injection & Grade of Pain after injection. Qualitative variable were analyzed as number (frequency) and percentages (relative frequencies) and quantitative variables were analyzed as mean and SD. Effectiveness was stratified among age, gender and duration of elbow pain to see the effect modification. The results were presented as tables and graphs. Statistical tests like Fisher's test/ T test were applied where required for significance keeping p value ≤ 0.05 as significant.

Results

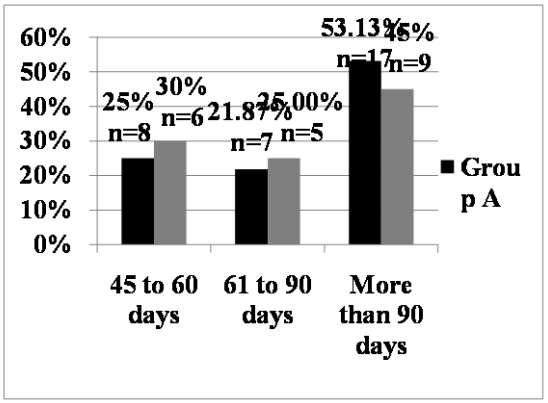
We managed 78 patients with lateral epicongylitis and 39 were in each group. In Group A (autologous blood injection), there were 15 (38.46%) males and 20 (61.54%) females. In Group B (steroid injection), there were 13 (33.33%) males and 26 (66.67%) females (p= 0.8137). The male to female ration in Group A and B was 1:1.6 and 1:2. Age distribution of patients in autologous blood injection (group A) and steroid injection (group B) in patients with lateral epicondylitis respectively were; 20 to 29 years were 8 (20.51%) and 6 (15.38%), from 30 to 39 years were 22 (56.41%) and 16 (41.03%), from 40 to 49 years of age were 5 (12.82%) and 10 (25.64%) and from 50 years and above were 4 (10.26%) and 7 (17.95%). (p= 0.304). The distribution of duration of symptoms in patients with lateral epicondylitis in autologous blood injection (group A) and steroid injection (group B) respectively were; 45 to 60 days were 10 (25.64%) and 12 (30.77%), 61 to 90 days were 11 (28.21%) and 17 (43.59%) and those who were having symptoms for more than 90 days were 18 (46.15%) and 10 (25.64%). (P=0.178).

Graph 1: Effectiveness Of Autologous Blood Injection (Group A) And Steroid Injection (Group B) In Patients With Lateral Epicondylitis.



P value = 0.0082

Graph 2: Distribution of Effectiveness of Autologous Blood and Steroid Injection in Patients with Lateral Epicondylitis According to Duration of Symptoms



P value = 0.810
n= number of observed patients, %=Percentage

Table 1: Distribution of Effectiveness of Autologous Blood and Steroid Injection in Patients with Lateral Epicondylitis According to Age

Age groups (years)	Group A n (%)	Group B n (%)	P value
20-29	7 (21.88%)	3 (15%)	0.763
30-39	21 (65.62%)	13 (65%)	
40-49	3 (9.38%)	2 (10%)	
50 years and above	1 (3.12%)	2 (10%)	

n= number of observed patients, %=Percentage

The mean ages of patients with lateral epicondylitis in autologous blood (group A) and steroid injection (group B) groups were 33.61 years ± 7.56SD and 33.61 years ± 11.65SD respectively. (p=1.0000). The mean duration of symptoms in patients with lateral epicondylitis in autologous blood (group A) and steroid injection (group B) groups were 59.61 days ± 35.09SD and 60.54 days ± 34.12SD with statistically insignificant p value of 0.9059.

Effectiveness of autologous blood injection (group A) and steroid injection (group B) in patients with lateral epicondylitis was 32 (82.05%) and 20 (21.58%) respectively statistically significant p value i.e. 0.0082. (Graph No. 1)

Age distribution of effectiveness in autologous blood injection (group A) and steroid injection (group B) in patients with lateral epicondylitis respectively were; 20 to 29 years were 7 (21.88%) and 3 (15.00%), from 30 to 39 years were 21 (65.62%) and 13 (65.00%), from 40 to 49 years of age were 3 (9.38%) and 2 (10.00%) and from 50 years and above were 1 (3.12%) and 2 (10.00%). (p value = 0.763) (Table No.1)

Distribution of effectiveness in autologous blood injection (group A) and steroid injection (group B) in patients with lateral epicondylitis according to duration of symptoms respectively were; 45 to 60 days were 8 (25.00%) and 6 (30.00%), 61 to 90 days were 7 (21.87%) and 5 (25.00%) and those who were having symptoms for more than 90 days were 17 (53.13%) and 9 (45.00%). (P=0.810) (Graph No.3)

Gender distribution of effectiveness in autologous blood injection (group A) and steroid injection (group B) in patients with lateral epicondylitis respectively were; male patients were 11 (34.37%) and 21 (35.00) while females were 7 (65.63%) and 13 (65%) with insignificant p value of 1.0000. (Table No.2)

Table 2: Distribution of Effectiveness of Autologous Blood and Steroid Injection in Patients with Lateral Epicondylitis According to Gender

Group	Male n(%)	Female n(%)	P value
Group A	11 (34.37%	7 (65.63%)	1.0000
Group B	21 (35%)	13 (65%)	

n= number of observed patients, %=Percentage

Discussion

Tennis elbow is one of the common painful conditions equally affecting both genders, which can make life miserable if not treated properly. Although it was originally described as an inflammatory process but currently initiated as a micro tear in the origin of extensor carpi radialis brevis (ECRB) [9]. Anatomic basis of injury involves multiple factors including hypovascular zones, eccentric tendon stresses and microscopic degenerative response in ECRB origin [10].

In this comparative study, we observed female predominance in both groups i.e. Group A and B was 1:1.6 and 1:2 respectively. A local study at Ayub Teaching Hospital has also documented female predominance with lateral epicondylitis[6]. A study conducted by Dr. Ajay Bharti et al has also reported that 78% were females having lateral epicondylitis and mostly were house wives involving regular household activities[11].

Effectiveness of autologous blood injection (group A) and steroid injection (group B) was 82.05% and 21.58% respectively. Our study showed that AB and LC injection therapy minimized the severity of pain, but AB seemed to be more effective and the difference was remarkable at 6 weeks (p = 0.0082).

Kazemi M, et al,[8] has shown better results for autologous blood (all p values equal to 0.001 except for grip strength, P = 0.005). In the corticosteroid group, differences in severity of pain (P = 0.008) and grip strength (P = 0.001) were significant. At 4 and 8 weeks, between-group analyses showed superiority of autologous blood for severity of pain, pain in grip, pressure pain threshold and Quick DASH questionnaire score. Edward SG, et al,[12] has reported that 79% patients with refractory LE were relieved completely of pain even during strenuous activity after AB injections after the average follow-up of 9.5 months, In a nonrandomized clinical trial by Mishra A, et al,[13] on 20 participants, after a follow-up of 26 weeks, researchers observed a significant decrease in pain sensation in AB group.

Autologous blood injection is based on the histopathological observation for tennis elbow that, tennis elbow results from a fibroblastic and vascular response called angiofibroblastic degeneration more commonly known as tendinosis. It results from invasion of blood vessels and migration of fibroblasts and lymphatics into the symptomatic area of the extensor carpi radialis brevis. The injection of autologous blood is thought to provide the necessary cellular and humoral mediators to induce a healing cascade[14,15,16]. This has been observed by some authors ultrasonically like Connell DA, et al,[17] who demonstrated reduction in the total number of interstitial cleft formations, anechoic foci, tendon thickness, hypoechoic change, and neovascularity in the tendon of ECRB. The study suggested that AB injection be a primary technique for the treatment of LE and that it can be used to guide injections and to monitor changes to the common extensor origin.

We performed the study in a community setting with patients of various socioeconomic classes. Participants' compliance was high and our physician was expert in injecting elbow. In our study, statistical analyses were straightforward, and missing data analysis was not required. Also, there were no reported or recognizable side-effects during the course of the study as LC has been reported to have some undesirable consequences like rupture or weakness of the extensor carpi radialis brevis tendon, infection, atrophies of subcutaneous fat tissue, and skin hypopigmentation; therefore, we were unable to compare the two groups with respect to complications of the treatments. Also age and gender distribution and duration of symptoms had statistically insignificant effects on the effectiveness of autologous blood injection and steroid injection in patients with lateral epicondylitis (p values =0.763. 1.0000 and 0.810 respectively) Overall, we have good evidence that AB is more advantageous over LC injection in the short-term treatment of LE.

Conclusion

We concluded that autologous blood injection is significantly effective than steroid injection in lateral epicondylitis in terms of improvement in at least one grade of pain on Visual Analogue Scale at 6 weeks follow up.

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