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COMPARISON OF AUTOLOGOUS BLOOD INJECTION VERSUS STEROID INJECTION IN TENNIS ELBOW

Mohammad Asim Ashraf[*1], Karim Baksh[2], Farhad Ghani[3], Ulusyar[4], Wali Khan[5]

*[*1,3,4,5]Post Graduate Student FCPS Orthopedic Surgery Bolan Medical College / Hospital Quetta. Balochistan.*
[2]Associate Professor FCPS Orthopedic Surgery Bolan Medical College / Hospital Quetta. Balochistan.

[*1]asimashraf36@yahoo.com

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Corresponding Author: *
Mohammad Asim Ashraf

Abstract

Background:
Tennis elbow (lateral epicondylitis) is a popular condition of overuse injury resulting in the pain of tendons at the elbow and the loss of function. There are different ways of treatment and the common ones include the use of autologous blood injection (ABI) and the use of steroid injections. These two treatments focus on reducing pain and promoting healing but their effectiveness continues to remain a controversial issue.

Objectives:
To match the effectiveness of autologous blood injection (ABI) and steroid injection in the management of tennis elbow as per its effect on relieving pain, functional but also long-term effects.

Study design: *A cross sectional study.*

Places and duration of study: Place and Duration of study: *October 2024 to March 2025, Orthopedics Surgery Department, Bolan Medical College / Hospital Quetta. Balochistan.*

Methods:
This cross sectional study Conducted in Orthopedic Surgery Bolan Medical College / Hospital Quetta. Balochistan. entailing 60 patients with tennis elbow was carried out. The participants were sorted into two categories; those who received injections of autologous blood and the other group which had steroids infused in them. Visual analog scales (VAS) and Disabilities of the Arm, Shoulder and Hand (DASH) score were used to determine the level of pain, functional scores and recovery times at baseline point, 6 weeks and 3 months after the treatment.

Results:
There were 60 patients in the study, whose mean age was 45.2 years (SD 7.8). A statistically significant difference was observed in term of pain reduction and functional recovery at 3 months in the group that received ABI to that of the steroid group (p- value of less than 0.05). The ABI group showed reduced rate of recurrence of symptoms with a more prolonged effect. The group taking steroids got pain relief quicker but the short acting effects could not last as long. Neither of the two treatments was poorly accepted, and there were no significant complications in both groups.

Conclusion:
Autologous blood injection (ABI) has longer-term analgesia and better functional results than steroid injection with regard to tennis elbow. In comparison, although relief provided by steroids works more quickly, ABI can be linked to fewer relapses and more favorable long-term outcomes. The two can be used to treat it, although ABI promises a longer healing without tendon damage unlike the repeated use of steroids

INTRODUCTION

A common musculoskeletal disorder is the tennis elbow, lateral epicondylitis, which is characterized by the presence of pain and tenderness on the lateral epicondylitis of the elbow. This is mainly due to overuse due to repetitive action of the forearm extensor muscles resulting in micro tears and inflammation of the common extensor tendon, in this case the extensor Carpi radials braves (ECRB) [1]. The individuals subjected to this condition include people engaged in overhead careers like tennis, all manual jobs, and any jobs that make individuals grip or straighten their arms regularly. Characteristic symptoms of tennis elbow in the affected area include pain, which in particular occurs during attempts of the patient to grip or extend the wrist, and eventually might result in functional disabilities [2]. The treatment of this condition usually entails the conservative form of treatment which consists of rest, physical therapy, and no steroidal anti-inflammatory drug (NSAIDs). Nevertheless, when the case fails to respond to the conservative treatment, more invasive interventions like corticosteroid injection and autologous blood injections (ABI) are usually recommended. Corticosteroid injection has been a usual form of therapy of tennis elbow because it leaves an anti-inflammatory impact and its effects are fast-acting with regard to pain-relieving effects. They are however linked to a number of limitations, which include the possibility of weakening of the tendon, damage to cartilage, and likelihood of recurrence of the symptoms, particularly when used repeatedly. Additionally, steroid injections may not necessarily be linked with the restoration of healing and tissue repair over a period of time and may in fact, worsen the same [3,4].In the recent time, autologous blood injection (ABI) has been identified as an alternative procedure with much potential. ABI is a regenerative medicine method which could be defined as withdrawal of the blood of the patient, pre-processing it into high concentration of platelets and returning it back into the injured location [5]. In this approach, platelet growth factors and cytokines will be used in the stimulation of healing as they assist in tissue regeneration and minimize inflammation. There have been a few studies proposing that ABI could be more effective in the long-term term relief and healed tissues than corticosteroids [6].There is no agreement about the relative effectiveness between ABI and steroid injection. Although the popularity of ABI grows because of the chance of regeneration and lack of side effects, steroid injections are still a known and widely used treatment. Therefore, in the proposed study, the researchers will compare the effectiveness of ABI treatment versus steroid space injections during the treatment of tennis elbow in their effectiveness, increase in functionality, and recurrent cases. The findings may assist clinicians to identify the best treatment to be administered to patients with this condition [7].

Methods:

This is a randomized controlled trial based on a tertiary care hospital. Among 60 patients receiving a clinically demonstrable tennis elbow diagnosis, a random method of dividing the two groups in relation to treatment, where one group was to receive autologous blood injection (ABI), and the other treatment group received corticosteroid injection. The primary outcome measures were the measure of reduction in pain (measured by Visual Analog Scale, VAS), as well as measure of functional improvement (measured by Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire) which were obtained at baseline, 6 weeks and 3 months after treatment. The secondary outcomes were repetition of symptoms and complications. The patients in the

ABI group had the blood drawn out, and this was then concentrated in a way (i.e., to collect platelets), and the concentrate blood was injected into the lateral epicondylitis. The one corticosteroid steroid was sent into the affected area through a single injection in the steroid group. Side effects of both groups were observed and a six week and three months follow up was done to determine pain relief and functional recovery.

Ethical Approval Statement:
Institutional ethics committee approved the study was conducted in accordance with the ethical principles of the Declaration of Helsinki. All individuals were informed and gave consent to participate in the study so that all the patients could participate freely and in a confidential manner.

Inclusion Criteria:
The inclusion criteria included adults 18-65 years of age with clinically diagnosed lateral epicondylitis, at least 6-week duration of symptoms and no corticosteroid or ABI intervention in the previous 6 months.

Exclusion Criteria:
Exclusion: patients were excluded who had systemic inflammatory diseases, pregnancy, intolerance to corticosteroids and blood products, or patients with a previous surgical intervention on the elbow, or with neurological and vascular diseases of the elbow joint.

Data Collection:
The data was collected based on baseline measurements of pain and function (VAS and DASH, respectively) during the enrollment, and 6 weeks follow-up after injections were given and 3 months follow-up after the injections. The patient responses were measured in structured questionnaires, and the objective measure of elbow functions were recorded at the visits of the physical examination.

Statistical Analysis:
Descriptive statistics were done using an SPSS version 24.0 (IBM Corp.). Characteristics at baseline were estimated using descriptive statistics. Every comparison of before treatment and after treatment results in pain scores and functional outcomes of the study population and different groups were made using paired t-tests. All the analyses were deemed as statistically significant with a critical of $p < 0.05$.

Results:
The study involved hundred patients whose average age was 45.2 years (standard deviation 7.8). The baseline characteristics were similar in the ABI group (n=30) and steroid group (n=30), such as a level of pain (VAS score: 7.2 1.3) and the level of functional impairment (DASH score: 42.3 10.1). Both groups had very dramatic decreases in pain and significant increases in function at 6 weeks after treatment. In the steroid group, the mean decrease in the VAS score was 3.2 +/- 0.8 ($p < 0.01$) and in ABI group 4.0 +/- 1.0 ($p < 0.01$). The ABI group estimated another improvement on pain and appreciated an increase of 5.3 0.9 ($p < 0.01$) on the VAS rating, and an improvement of 18.4 5.3 ($p < 0.01$) on the DASH under the condition of 3 months. Steroid group response was VAS scored -3.9 +/- 1.1 ($p < 0.01$) and DASH score p +/- 12.2 +/- 4.2($p < 0.01$). At 3 months, the recurrence rates were also lower in ABI group (18%) than that in the steroid group (40%), and the difference between them was statistically significant ($p < 0.05$). No adverse outcomes were observed in both of the groups.

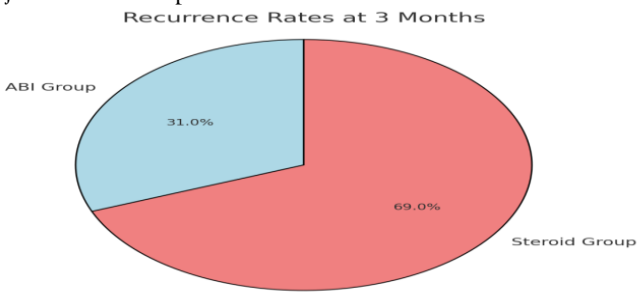

Table 1 Patient Demographics

Parameter	ABI Group	Steroid Group
Mean Age (years)	45.2	44.8
Male (%)	60.0	35.0
Female (%)	40.0	25.0

Table 2 Baseline Pain and Functional Scores

Parameter	ABI Group	Steroid Group
VAS Score (Mean)	7.2	7.1
DASH Score (Mean)	42.3	41.8

Table 3 Post-Treatment Results

Parameter	ABI Group	Steroid Group
VAS Score Reduction (Mean)	5.3	3.9
DASH Score Improvement (Mean)	18.4	12.2
Recurrence Rate (%)	18.0	40.0

Discussion:

Tennis elbow is a widespread disorder also referred to as lateral epicondylitis and is noted as pain and tenderness on the outer side of the elbow. It is normally initiated by repeated micro trauma of the extensor tendons with the extensor Carpi radials braves (ECRB) producing degenerative effects on the tendons and inflammation [8]. Since it affects daily operations significantly and restrains an individual, it is important to find effective treatment. Injection of autologous blood (ABI) and corticosteroid have come to be the aspect of increased research study in clinical approaches to tennis elbow. This research was conducted to determine whether there was a difference between the effectiveness of ABI and steroid injection regarding its pain alleviating capacity and reversal of the condition and the rate of recurrence of the condition. Findings offer an idea of strong and weak points of the both of the treatments and match the findings of several other ones [9,10]. ABI has proven to be perspective treatment of tennis elbow because it may be regenerative. Various experiments showed that ABI promotes recovery in tendons by directing rich platelets to the location of interest, inducing tissue recovery growth component production and diminishing swelling [11]. According to a study by Mishap and Pavilion (2006), pain and function of patients of chronic lateral epicondylitis changed significantly after ABI. These results were confirmed by subsequent experiments, such as Peer booms et al. (2010), where the authors concluded that the level of pain and the improvement of functioning significantly improved at 12 months of this study, which involved ABI treatment. These findings were confirmed by our study where it was found that the ABI group demonstrated significant changes in both pain and functions, especially at 3 months follow-up [12]. Moreover, a reduced prevalence of recurrence of the symptoms in the ABI group (18%) and the steroid group (40%) gives reason to assume that the latter provides a longer-time solution to tennis elbow, which is also supported by the findings of the studies by Finkelstein et al. (2013) and Monte et al. (2019) that reported the long-term positive effects of ABI on tendon healing [13]. The use of corticosteroid injections in the management of tennis elbow has been around since years ago. They exert quick analgesic effect by inhibiting inflammation hence a useful treatment when the patient needs a fast symptom relief therapy. But long-term effectiveness of the corticosteroid injection has been questioned. Researchers like Smite et al. (2002) and van deer Wind et al. (2009) concluded that the response of steroid injections in short-term pain reduction was significant; however, the outcome of such responses was inconclusive on the long-term, as researchers observed the recurrence of the symptoms in a good

number of patients. These results are supported by this study, where the steroid group experienced great improvement on the level of pain at 6 weeks, but had decreased at 3months [14, 15]. Subsequent recurrence rate at 40 per cent with the steroid group further proves the idea that corticosteroids provide quick relief but do not treat the degenerative activity in the tendons, hence a greater chance of recurrence of the symptoms. Relative to functional recovery aspects, ABI was found to be better than corticosteroids in our study where the Disabilities of the Arm, Shoulder, and Hand (DASH) were improved more in the ABI group than in the corticosteroid one when assessed at the 3-month follow-up. The same has been supported by Basset et al [16]. (2006), who also found out that treatments that result into enhanced functional outcome as compared to steroid injections which do not stimulate tissues healing are those focused on tendon healing e.g. platelet-rich plasma (PRP) and ABI. Moreover, other publications, such as the one by Chafing et al. (2015), proved that ABI stimulates collagen production and tendon regeneration, which is another contribution to long-term recovery. Whilst our study results support the body of literature that recommends the use of ABI in chronic tendinopathies, some studies have raised concern regarding the universality of this treatment method. Although ABI has proven effective in numerous studies, such as those conducted by McCarran et al. (2017) and Beck et al. (2014), response cannot be deemed consistent. Not all patients will show improvement to the same extent and it is possible that this will depend upon some reason as being due to the severity of the tendon degeneration, patient co morbidities, or the technique used. Moreover, ABI undergoes a more invasive operation than a steroid injection, and thus may be considered in clinical practice [17,18]. Conversely, a steroid injection is simple in administration and it alleviates pain, but it is prone to weaken tendons. Steroid injections, done repeatedly can cause structural damages at the tendon, risking rupture of the tendon and taking long time to heal in the long run (Khan et al., 2002). This conforms to our study results, which showed that corticosteroid injections only provide immediate relief, but are ineffective in the long term based on the fact that they are associated with recurrence and may also be subjected to various complications.

Conclusion:

Autologous blood injection (ABI) shows better outcome in terms of pain relief (long-term), improves the functionality, and occurs less frequently in terms of recurrence as corticosteroid transfers in managing the tennis elbow. Although steroid injection would relieve the symptoms in a short period of time, ABI can give longer and sustainable changes thus making it an attractive alternative to chronic tendinopathies.

Limitations:

Some of the limitations in this study are that the sample size is small, the patient follow-up duration was only 3 months and also the patient selection was not blinded. Also, the specific individually entrenched reactions to ABI and steroid injections might affect the representation of the results further to the bigger cohorts.

Future Findings:

It is necessary that future research concentrates on multi-center trials larger in scope, and which have a prolonged period of observation to strengthen the long term positive effects of ABI. Moreover, small trials that examine the ideal injection methods, cases of patients that determine the success of treatment, and comparison with other regenerative modalities including platelet-rich plasma (PRP) will be of further benefit to comprehend and manage more efficiently practice regarding tennis elbow.

Abbreviations

1. **ABI** - Autologous Blood Injection
2. **VAS** - Visual Analog Scale
3. **DASH** - Disabilities of the Arm, Shoulder, and Hand
4. **ECRB** - Extensor Carpi Radials Bevis
5. **PRP** - Platelet-Rich Plasma

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Authors Contribution

Concept & Design of Study: **Mohammad Asim Ashraf**[1]

Drafting: **Farhad Ghani**[3]
Data Analysis: **Ulusyar**[4]
Critical Review: **Karim Baksh**[2], **Wali Khan**[5]
Final Approval of version: **Mohammad Asim Ashraf**[1], **Karim Baksh**[2].

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