

Comparison of autologous blood injections versus steroid injections in tennis elbow

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Abstract

Background: There are many treatment options for tennis elbow patients, with variable results.

Objective: To compare the pain relief of lateral epicondylitis (tennis elbow) by autologous blood injection versus local steroid injection.

Methodology: Settings: Department of Orthopedic Surgery Sheikh Zayed Medical College/ Hospital Rahim Yar Khan. Duration: July 2014 to January 2015. Study Design: Comparative study. Subject: A total of 400 patients fulfilling the inclusion criteria were selected. Patients were randomly divided into two groups A and B, Group A received local injection of autologous blood and group B received steroid local injection. The injection was administered in the outpatient department observing all aseptic measures under supervision of consultant. The needle was introduced just proximal to the lateral epicondyle and the contents injected on the undersurface of the Extensor Carpi Radialis group of muscles. Final outcome was assessed at the end of 12 weeks.

Results: In present study, there were 400 cases (200 each group). The mean age of the subjects was 36.74 ± 7.62 vs 35.73 ± 7.88 years in group A and B respectively. Pain relief by autologous blood injection (group A) versus local steroid injection (B) was 82% vs. 64% respectively with $p=0.0005$. On stratification of gender and age pain relief was high in autologous blood injection than local steroid injection significantly in all the subgroups.

Conclusion: Autologous blood injection is significantly better than steroid injection in tennis elbow patients and this difference is also seen in all age groups and genders.

Key Words: Lateral epicondylitis, Autologous blood injection, Local steroid injection, pain relief.

Introduction

Lateral epicondylitis (tennis elbow) is one of the common disorders that are encountered in the Orthopedics clinics and out patient departments, and are also denoted as Tennis elbow.¹ Overall global incidence rate of this is around 4 per 1 thousand subjects; , the number varies across the globe, however it is more common in female and in the age range of 30 to 50 years.^{1,2}

This is a misnomer term and this neither occurs in the athletes and nor there is any underlying inflammation. In contrast to this there is disarray between angio-fibrotic degeneration and collagen distribution. Due to decreased vascularity of the tendons, they are at higher risk for ischemic injuries and is the most common cause, moreover, tendinitis is another entity that can result in this.^{3,4}

It is usually defined as spectrum of signs and symptoms, observed in non athlete persons that are found around the lateral aspect of the elbow; courtesy repetitive movements of the same joint at number of times in a slightly bad posture.⁵ The pain is the most widely reported complaint, however, there are significant number of cases that

have shown weakness and strength of the grip while extending their elbow and hence impact largely on day to day activities.^{5,6}

There are number of treatment options available, each carrying its own benefits, costs, risk and side effect profiles; and there is no standard consensus regarding this.⁷⁻¹⁰ Decisions are made on individual basis. Non-steroidal anti-inflammatory drugs (NSADS) are the most widely used agents, but data is not that promising for longer term pain relief. Intra articular corticosteroid injection has shown good results and so is seen with autologous blood transfusion which have also shown promising results.¹¹⁻¹⁵ That's why this study was planned to compare these two modalities for better outcome.

The objective of this study was to compare the pain relief of lateral epicondylitis (tennis elbow) by autologous blood injection versus local steroid injection.

Methodology

Study Design: Comparative study. **Setting:** Department of Orthopedic, Surgery Sheikh Zayed Medical College/ Hospital, Rahim Yar Khan.

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Duration of Study: July 2014 to January 2015.
Sampling Technique: Non probability consecutive sampling.

Sample Selection

Inclusion criteria: Chronic cases of Lateral Epicondylitis (as per operational definition) of duration > 4 weeks, Patients of both sexes of age between 20-50.

Exclusion criteria: Cases of Lateral Epicondylitis of duration < 4 weeks, Already managed by any other non operative methods. (Immobilization, Casting or Physiotherapy), Patients with other associated injuries in same elbow i.e. Supra Condylar Fracture and Lateral Humeral Condyle Fractures.

Lateral Epicondylitis: It was diagnosed by Cozen test, which consists of pronation of the forearm with resisted wrist extension and radial deviation to determine if pain occurs. **Pain relief:** Pain relief was assessed by visual analogue pain scale (VAS). Patients having score 0 were labeled as having no pain and those with pain were scored against 1-10 where 1 is minimum and 10 is maximum.

Patients were divided into two groups A and B, (group A receiving local injection of autologous blood and group B receiving local steroid injection) by using lottery method. In Group A, 2 ml of autologous venous blood was drawn from the ipsilateral or the contralateral upper limb and was injected. In Group B, 40 mg of methyl prednisolone acetate was used along with 1ml of 2% lignocaine solution. The needle was introduced just proximal to the lateral epicondyle and the contents were injected on the undersurface of the Extensor Carpi Radialis group of muscles according to due protocols. Patients were advised to restrain from activities involving repetitive movements of the wrist and elbow during initial 3 weeks after injection. Gentle passive stretching exercises of the extensor group of muscles were started as soon as the pain permitted. Final outcome was assessed at the end of 12 weeks for pain relief.

Statistical analysis:

Data was analyzed by SPSS version 16.0. Mean and standard deviation were calculated for quantitative variables and frequency and percentage were calculated for qualitative

variables. Chi-Square test was applied to compare pain relief between groups and to stratify against confounding variables. Post stratification p value ≤ 0.05 was taken as significant.

Results

In the present study, there were 400 cases (200 each group). The mean age was 36.74 ± 7.62 vs 35.73 ± 7.88 years in group A and B respectively and VAS of 1.82 ± 1.49 vs 2.31 ± 1.87 in group A and B respectively. Out of total, 194 (48.5%) were male and 206 (51.5%) were female.

Table I: Comparison of pain relief between both groups

Pain relief	Group A (n=200)	Group B (n=200)	Total	P-Value
Yes	164 (82%)	128 (64%)	292	0.0005
No	36 (18%)	72 (36%)	108	

Table II: Comparison of pain relief between both groups vs gender and age groups

Pain relief in male	Group A n=102	Group B n=92	Total	P-Value
Yes	86(84.3%)	60(65.2%)	146	0.002
No	16(15.7%)	32(34.8%)	48	
Pain relief in female	Group A n=98	Group B n=108	Total	P-Value
Yes	78(79.6%)	68(63%)	146	0.009
No	20(20.4%)	40(37%)	60	

Table III: Comparison of pain relief between both groups vs age groups.

Pain relief in age group 20-30 year	Group A n=60	Group B n=68	Total	P-Value
Yes	52 (86.7%)	46 (67.6%)	98	0.011
No	8 (13.3%)	22 (32.4%)	30	
Pain relief in age group 31-40 year	Group A n=79	Group B n=69	Total	P-Value
Yes	63(79.7%)	43(62.3%)	106	0.019
No	16(20.3%)	26(37.7%)	42	
Pain relief in age group 41-50 year	Group A n=61	Group B n=63	Total	P-Value
Yes	49(80.3%)	39(61.9%)	88	0.024
No	12(19.7%)	24(38.1%)	124	

Pain relief by autologous blood injection (group A) versus local steroid injection (group B) was 82% vs. 64% respectively with $p=0.0005$ as in table I. On stratification of gender and age pain relief was high in autologous blood injection than local steroid injection significantly in all the subgroups as shown in table II and III.

Discussion

Tennis elbow is not uncommon and is seen in number of cases. Pain is the primary concern in these cases and majority of them report for a long use of analgesics and that's why pose another great psychological stress.¹⁶⁻¹⁸ In the present study, there were 400 cases (200 each group). The mean age was 36.74 ± 7.62 vs 35.73 ± 7.88 years in group A and B. And over all out of 400 patients 194 (48.5%) were male and 206 (51.5%) were females, with slight female dominance, which was in accordance to previous studies which relate that men and women were almost equally affected.⁹⁻¹⁰ This can be attributed by the reason that in our culture women are engaged in daily activities which involve repetitive activity of hands involving supination and pronation. By stratification of age and VAS score it is clear that more pain relief occurred in age group 20 to 30 years.

That was probably because of more compliance in this group as we have noticed. Furthermore, patients in this group were younger than other two groups so it is supposed that they had good immune status that helped in good recovery. In the present study, pain relief by autologous blood injection (group A) versus local steroid injection group B was 82% vs. 64% respectively with $p=0.0005$ and furthermore, on stratification of gender and age pain relief was high in autologous blood injection than local steroid injection significantly in all the subgroups. These results were in line with the findings of the previous studies. According to a study done by Mellor et al, it was seen that corticosteroids were better in terms of rapidity of pain relief but their efficacy was short lived and overall pain relief was better in autologous transfusion.⁹

This was explained by the basis factor that autologous blood injection, starts a cascade of inflammation and potentiates the invasion of various mediators for regeneration.^{10,11} Mellor further found that pain relief was seen in 79% of

cases at mean of 9.5 months,⁹ / 94.2% after 6 months,¹³ and another study found this in 58% after 8 months.¹² Another study found that poor results can be due to refractory course of the disease.¹³ There were seen a role of number of neurokinins, substance P, non-inflammatory and fibroblastic activities, neovascularization, and mucoid degeneration in the pathophysiology and the target oriented therapies. Recurrence rate is very high in cases managed with corticosteroids, however, they have shown significant better results in the earlier part.¹⁸⁻¹⁹ There have been a number of randomized controlled trial done to compare these two and the other modalities and it has been seen that autologous blood is better than corticosteroids, placebo, platelet rich plasma, placebo, or extracorporeal shock wave therapy.¹⁸⁻²³ In a study done by Creaney L they compared plasma vs blood transfusion and it was seen that in the former, the need of surgical intervention later was seen in 20% as compared to 10% only in autologous transfusion.²³

Conclusion

Autologous blood injection is significantly better than steroid injection in patients of tennis elbow and this difference is also seen in all age groups and genders.

Authors Contribution: **AH:** Conception of work, drafting and final approval. **MZI:** Acquisition & analysis of data, revising and final approval. **AR:** Interpretation of data, revising and final approval. **MSR:** Conception of work, analysis of data, revising and final approval. **MTS:** Conception of work, revising and final approval. **ZA:** Conception of work, revising and final approval.

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References

1. Bisset L, Beller E, Jull G, Brooks P, Darnell R, Vicenzino B, et al. Mobilisation with movement and exercise, corticosteroid injection, or wait and see for tennis elbow: Randomised trial. *BMJ*. Nov 4 2006;333(7575):939
2. Altan L, Kanat E. Conservative treatment of lateral epicondylitis. Comparison of two different orthotic devices. *Clin Rheumatol* Aug 2008;27(8):1015-9.
3. Jafarian FS, Demneh ES, Tyson SF, et al. The immediate

- effect of orthotic management on grip strength of patients with lateral epicondylitis. *J Orthop Sports Phys Ther*. Jun 2009;39(6):484-9.
4. Hamilton PG The prevalence of humeral epicondylitis: a survey in general practice. *J R Coll Gen Pract* 1986; 36: 464–465.
 5. Assendelft WJ, Hay EM, Adshead R, Bouter LM, et al. Corticosteroid injections for lateral epicondylitis: a systematic overview. *Br J Gen Pract* 1996; 46: 209–216.
 6. Kivi P. The etiology and conservative treatment of humeral epicondylitis. *Scand J Rehabil Med* 1983; 15: 37–41.
 7. Halle JS, Franklin RJ, Karalfa BL, et al. Comparison of four treatment approaches for lateral epicondylitis of the elbow. *J Orthop Sports Phys Ther* 1986; 8: 62–69.
 8. Herquelot E, Guéguen A, Roquelaure Y, Bodin J, Sérazin C, Ha C, et al. Work-related risk factors for incidence of lateral epicondylitis in a large working population. *Scand J Work Environ Health*. Nov 2013;39(6):578-88
 9. Mellor S. Treatment of tennis elbow: the evidence. *BMJ* 2003;327:330.
 10. Edwards SG, Calandruccio JH. Autologous blood injections for refractory lateral epicondylitis. *J Hand Surg Am* 2003, 28A: 272–278.
 11. Connell DA, Ali KE, Ahmad M, Lambert S, Corbett S, Curtis M, et al. Ultrasound-guided autologous blood injection for tennis elbow. *Skeletal Radiol* 2006;35:371–7.
 12. Gani N, Butt MF, Dhar SA, Farooq M, Mir MR, Kangu KA, et al. Autologous blood injection in the treatment of refractory tennis elbow. *Int J Orthop Surg* 2007;5:1.
 13. Baily RA, Brock BH. Hydrocortisone in tennis elbow; a controlled series. *Proc R Soc Med* 1957;50:389–90.
 14. Alfredson H, Ljung BO, Thorsen K, Lorentzon R, et al. In vivo investigation of ECRB tendons with microdialysis technique—no signs of inflammation but high amounts of glutamate in tennis elbow. *Acta Orthop Scand* 2000;71:4759
 15. Ljung BO, Forsgren S, Friden J, et al. Substance P and calcitonin gene-related peptide expression at the extensor carpi radialis brevis muscle origin: implications for the etiology of tennis elbow. *J Orthop Res* 1999;17:554–9
 16. Ljung BO, Alfredson H, Forsgren S, et al. Neurokinin 1-receptors and sensory neuropeptides in tendon insertions at the medial and lateral epicondyles of the humerus. *Studies on tennis elbow and medial epicondylalgia. J Orthop Res* 2004;22:321–7
 17. Mardani-Kivi M, Karimi-Mobarakeh M, Karimi A, Akhoondzadeh N, Saheb-Ekhtiari K, Hashemi-Motlagh K, et al. The effects of corticosteroid injection versus local anesthetic injection in the treatment of lateral epicondylitis: a randomized single-blinded clinical trial. *Arch Orthop Trauma Surg* 2013;133:757–63
 18. Smidt N, Assendelft WJ, van der Windt DA, Hay EM, Buchbinder R, Bouter LM, et al. Corticosteroid injections for lateral epicondylitis: a systematic review. *Pain* 2002 ;96:23–40
 19. Krogh TP, Bartels EM, Ellingsen T, Stengaard-Pedersen K, Buchbinder R, Fredberg U, et al. Comparative effectiveness of injection therapies in lateral epicondylitis: a systematic review and network meta-analysis of randomized controlled trials. *Am J Sports Med* 2013;41:1435–46.
 20. Ozturan KE, Yucel I, Cakici H, Guven M, Sungur I, et al. Autologous blood and corticosteroid injection and extracorporeal shock wave therapy in the treatment of lateral epicondylitis. *Orthopedics* 2010;33:84–91
 21. Wolf JM, Ozer K, Scott F, Gordon MJ, Williams AE, et al. Comparison of autologous blood, corticosteroid, and saline injection in the treatment of lateral epicondylitis: a prospective, randomized, controlled multicenter study. *J Hand Surg Am* 2011;36:1269–72
 22. Thanasas C, Papadimitriou G, Charalambidis C, Paraskevopoulos I, Papanikolaou A, et al. Platelet-rich plasma versus autologous
 23. Creaney L, Wallace A, Curtis M, Connell D, et al. Growth factor-based therapies provide additional benefit beyond physical therapy in resistant elbow tendinopathy: a prospective, single-blind, randomised trial of autologous blood injections versus platelet-rich plasma injections. *Br J Sports Med* 2011;45:966–71

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