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A Prospective Study to Compare the Patient-Rated Tennis Elbow Evaluation (Prtee) Score between Autologous Blood Injection and Steroid Injection in Lateral Epicondylitis of Humerus

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Abstract

Background: Lateral epicondylitis, or tennis elbow, is commonly encountered in orthopaedic practice, being the second most frequently diagnosed musculo-skeletal disorder in the neck and upper extremity in a primary care setting.

Methods: One hundred and twenty patients (two groups, sixty in each) diagnosed with tennis elbow of age group 20 – 65 years were included in the study between August 2014 to April 2016 in the department of orthopaedics in Dr. B.S.A. Medical College and Hospital, Rohini, New Delhi. One group was given local autologous blood injection (ABI) and the other group was given local corticosteroid injection (CSI).

Results- In our study the mean value of pre procedure PRTEE score of the ABI group were 84.78±8.58) and that of the CSI group were 84.62±8.74, with insignificant differences between the groups (p= 0.979). 6th week PRTEE score of the ABI group were 24.75±6.36 and that of CSI group were 28.27±14.94. The difference in values of (p=0.246) between ABI and CSI groups were not significant, showing equivalent results on 6th week follow up. The decrease in the mean value of the PRTEE score in 12th week of post procedure as compared to the pre procedure level in ABI group and CSI group were 74.32±13.92 and 55.38±21.48 respectively, which is significant with a p value of <0.001.

Conclusion: We concluded that local autologous whole blood injection is a safe, effective, inexpensive, patient friendly, technically less demanding and very encouraging treatment modality for lateral epicondylitis of humerus with no or minimal complications.

Keywords: PRTEE, Elbow, Humerus, Lateral epicondylitis

Introduction

Lateral epicondylitis, or tennis elbow, is commonly encountered in orthopaedic practice, being the second most frequently diagnosed musculo-skeletal disorder in the neck and upper extremity in a primary care setting. It has an incidence of between four and seven per 1000 cases per year in general practice, with a peak between the ages of 35 and 54 years, and a mean age of approximately 42 years. An epidemiological study reported that 87% of cases involved the dominant arm.[1]

The characteristic clinical findings are pain and tenderness over the lateral epicondyle. Lateral epicondylitis has been reported to be the result of overuse from many activities. Although it is often referred to as tennis elbow, it is seen to affect non-athletes rather than athletes.[2]

Most conservative modalities such as local injection of corticosteroid have focused on suppressing an inflammatory process that does not actually exist. It is theorised that the beneficial effects of the steroid injection result from the bleeding caused by forcing fluid through tissue planes at high pressures.[3]

Recently an injection of autologous blood has been reported to be effective for both intermediate and long-term outcomes for the treatment of lateral epicondylitis, with a significant decrease in pain. Chemical modifiers of cellular activity carried in the blood and are known to be mitomorphogenic. Injection of autologous blood might provide the necessary cellular and humeral mediators to induce a healing cascade.[6]

There are very few studies that have evaluated the injection of autologous blood for lateral epicondylitis as a treatment modality. The objective of this study was to evaluate the efficacy and role of autologous blood - injection for the treatment of lateral epicondylitis, - compared with the commonly used local injection of cortico-steroid

Materials And Methods

Study Design: This study was conducted on 120 adult patients of either sex presenting to the OPD of Department of Orthopaedics, Dr Baba Saheb Ambedkar Medical College and Hospital, Rohini, Delhi with the complaint of pain on lateral aspect of elbow and clinically diagnosed as cases of lateral epicondylitis (Tennis elbow) after taking their informed consent for procedure and to participate in study.

Sample size: 120

Types of study: Prospective and Randomized Comparative Study.

Randomization Technique: Block Randomization with Sealed envelope system

In this, I prepared 20 randomly generated treatment allocations within sealed opaque envelopes assigning A and B in 10 envelopes each, where A represents Group A receiving Blood Injection and B represents Group B receiving Steroid injection. Once a patient gave consent to enter a trial an envelope was opened and the patient was then offered the allocated group. In this technique, patients randomized in a series of blocks(6) of 20 that is, for every 20 patients randomized 10 received Group A treatment and other 10 received Group B treatment.

Inclusion criteria

1. > 18 years of age of either sex.
2. Tenderness on palpation of lateral epicondyle or just distal to it, not associated with other condition.
3. If one of these critical test is positive

(a) Mills test positive

(b) Cozen test positive

Exclusion criteria

1. Hypersensitivity to lignocaine.

2. Pregnancy.
3. Coexisting pathology. i.e. RA of elbow, cervical radiculitis
4. Coexisting systemic disease such as Diabetes mellitus or Hypertension or metabolic disease such as gout.
5. Any other coexisting condition requiring analgesics during the course of study period.
6. Previous surgery for Lateral epicondylitis.
7. Patients who have received any form of treatment for lateral epicondylitis except analgesics.
8. Patients who have received steroid injections (local or systemic) within three months.
9. Previous history of trauma around elbow
10. Regional pain syndrome.

Methods of data collection

Patients attending OPD of Orthopaedics were included in this study after a diagnosis of Lateral Epicondylitis, which included interview and clinical examination comprising testing for tenderness over the lateral epicondyle or just distal to it, a positive Cozen's test and Mill's test. Informed consent was taken from the patient.

Group A (ABI group, 60 patients) was designated to receive an injection of autologous blood. Patients were infiltrated with injection of 2 ml of autologous blood drawn from the contralateral anticubital vein mixed with 1 ml of lignocaine after testing for lignocaine sensitivity, at the lateral epicondyle.

Group B (CSI group, 60 patients) was designated to receive an injection of local corticosteroid. Patients were infiltrated with 2 ml of methyl prednisolone acetate (80 mg) mixed with 1ml of lignocaine after testing for lignocaine sensitivity, at the lateral epicondyle according to the same technique.

Results

One hundred and twenty patients (two groups, sixty in each) with tennis elbow of age group 20 – 65 years were included in the study.

Table 1: Age distribution (In years) in groups

Age (In years)	Groups		Total	P value
	ABI	CSI		
1) <=20	3 (5.00%)	1 (1.67%)	4 (3.33%)	
2) 21-30	19 (31.67%)	15 (25.00%)	34 (28.33%)	
3) 31-40	21 (35.00%)	23 (38.33%)	44 (36.67%)	0.710
4) 41-50	10 (16.67%)	11 (18.33%)	21 (17.50%)	
5) >50	7 (11.67%)	10 (16.67%)	17 (14.17%)	
Total	60 (100.00%)	60(100.00%)	120(100.00%)	

In this study, majority of patients were of age group of 31-40 years (36.67%). The youngest patient was of 20 years and oldest was of 65 years. The mean age of the total study group was 37.06±10.75 years and that of ABI and CSI group was 35.73±10.73 years and 38.38±10.7 years respectively.

Table 2: Sex distribution in groups

Sex	Groups		Total	P value
	ABI	CSI		
Female	35 (58.33%)	34 (56.67%)	69 (57.50%)	0.853
Male	25 (41.67%)	26 (43.33%)	51 (42.50%)	
Total	60 (100.00%)	60 (100.00%)	120 (100.00%)	

X2=0.034 df=1

In this study, females (69, 57.50%) were more commonly involved than males (51, 42.50%). 35 (58.33%) and 25 (41.67%) were the number of females and males in ABI group and 34 (56.67%) and 26 (43.33%) were that of CSI group respectively.

Table 3: PRTEE scores

Pre PRTEE score	Total(n=120)	ABI(n=60)	CSI(n=60)	P value
Mean ± SD	84.7 ± 8.63	84.78 ± 8.58	84.62 ± 8.74	0.979
Median	84.5	84.5	84.5	
Min-Max	70-99	70-99	70-99	
Inter quartile Range	76 - 90	76.5 – 90	76 – 90	
Second week PRTEE score				<.0001
Mean ± SD	39.88 ± 11.19	45.47 ± 4.18	34.28 ± 13.09	
Median	40	45	31	
Min-Max	26-98	40-68	26-98	
Inter quartile Range	31 - 45	45 – 46	31 – 31	
Sixth week PRTEE score				0.246
Mean ± SD	26.51 ± 11.57	24.75 ± 6.36	28.27 ± 14.94	
Median	24	24	24	
Min-Max	18-95	19-69	18-95	
Inter quartile Range	23 - 26	22 – 26	23 - 27.5	
Twelfth week PRTEE score				<.0001
Mean ± SD	19.85 ± 17.12	10.47 ± 8.47	29.23 ± 18.45	
Median	18.5	9	22	
Min-Max	0-98	0-70	17-98	
Inter quartile Range	9 - 22	8 – 10	20 – 26	
Decrease in PRTEE score in 2nd week				<.0001
Mean ± SD	44.82 ± 13.94	39.32 ± 9.72	50.33 ± 15.35	
Median	45	39.5	53	
Min-Max	0-72	2-59	0-72	
Inter quartile Range	39 - 54	34 - 44.5	45 – 59	

Decrease in PRTEE score in 6th week				
Mean ± SD	58.19 ± 14.69	60.03 ± 11.55	56.35 ± 17.17	
Median	60	60.5	60	0.355
Min-Max	0-79	1-78	0-79	
Inter quartile Range	53 - 66.5	55.5 – 66	52 - 67	
Decrease in PRTEE score in 12th week				
Mean ± SD	64.85 ± 20.38	74.32 ± 13.92	55.38 ± 21.48	
Median	66.5	76	60.5	<.0001
Min-Max	0-96	0-96	0-81	
Inter quartile Range	56 - 77	66.5 – 82	54 - 66.5	
Decrease in PRTEE score in 6th week as compared to 2nd week				
Mean ± SD	13.37 ± 8.71	20.72 ± 5.09	6.02 ± 4.13	
Median	12	21	7	<.0001
Min-Max	-9-30	-1-30	-9-13	
Inter quartile Range	7 - 21	18 – 24	3.5 - 8.5	
Decrease in PRTEE score in 12th week as compared to 6th week				
Mean ± SD	6.66 ± 11.04	14.28 ± 4.98	-0.97 ± 10.14	
Median	8	15	1.5	<.0001
Min-Max	-46-23	-3-23	-46-10	
Inter quartile Range	1 - 15	11.5 – 17	-1.5 - 4	

Discussion

Keeping these facts in mind, 120 patients (60 in each group) with lateral humeral epicondylitis were treated with single autologous whole blood injection (ABI) and local corticosteroid (methylprednisolone) injection (CSI) at the point of maximum tenderness at common extensor origin , in the department of Orthopaedics, Dr Baba Saheb Ambedkar Medical College and Hospital, New Delhi between 2014-2016.

In our study the mean value of pre procedure PRTEE score of the ABI group were 84.78 (8.58) and that of the CSI group were 84.62 (8.74), with insignificant differences between the groups (p= 0.979). 6th week PRTEE score of the ABI group were 24.75 (6.36) and that of CSI group were 28.27 (14.94). The difference in values of (p=0.246) between ABI and CSI groups were not significant, showing equivalent results on 6th week follow up.

Singh et al[7]- pre procedure PRTEE score was 72.8(6.97) and 73.20(8.16) in ABI and CSI groups respectively with insignificant differences between the groups (p=0.8389). 2nd week PRTEE score of the ABI group was 40.93 (5.94) and that of CSI group was 35.60 (3.62) respectively. The difference in values of PRTEE (p=0.00009) between ABI and CSI groups was highly significant, showing superiority of CSI over ABI

on 2nd week follow up. 6th week PRTEE score of the ABI group was 24.46 (4.58) and that of CSI group was 24.53 (4.71) respectively. The difference in values of PRTEE (p=0.9603) between ABI and CSI groups was not significant on 6th week follow up.

The decrease in the mean value of the PRTEE score in 12th week as compared to the pre procedure level in ABI group and CSI group were 74.32 (13.92) and 55.38 (21.48) respectively.

Conclusion

We concluded that local autologous whole blood injection is a safe, effective, inexpensive, patient friendly, technically less demanding and very encouraging treatment modality for lateral epicondylitis of humerus with no or minimal complications.

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