

## ORIGINAL ARTICLE

## TENNIS ELBOW: ROLE OF LOCAL STEROID INJECTION

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**Background:** Tennis elbow is a condition, characterised by pain and tenderness over the lateral epicondyle of the humerus, and pain on resisted dorsiflexion of the wrist, middle finger, or both. The aim of this randomised controlled trial was to investigate the short term efficacy of local steroid injection compared with oral and topical NSAIDs. **Methods:** Sixty patients (45 male and 15 female) were included in the study. The mean age was 42 years for men and 40 years for women. They were placed in group A and B (30 cases each). Group A received local steroid injection (triamcinolone 20 mg mixed with lignocaine 2% 1 cc) and topical NSAID cream application (diclofenac diethylammonium) twice a day, tab. diclofenac sodium 50 mg twice a day for 3 weeks. Group B received tab diclofenac 50 mg twice a day and, topical NSAID cream application twice a day for 3 weeks. Assessment of patients was made 3 times; first at the start of the study, 2<sup>nd</sup> time after 6 weeks, and 3<sup>rd</sup> time after 12 weeks. A blinded assessor rated the elbow complaints of the patients at resisted dorsiflexion of wrist using VAS (0=no severity, 1–3 mild, 4–6 moderate, 7–9 sever, 10=maximum severity). **Results:** At six weeks, 22 (73.33%) patient in group A had no pain as compared to 7 (23.33%) patients in group B who were pain free ( $p<0.0001$ ,  $\chi^2=38.75$ ). At 12 weeks 27 (90%) patients in group A were pain free compared to group B in which 7 (23.33%) patients were pain free ( $p<0.0001$ ,  $\chi^2=27.56$ ). **Conclusion:** In patients with tennis elbow, the use of local steroid injection in combination with topical and oral NSAIDs is superior to the use of combination of topical and oral NSAIDs. Better results with combination therapy using local steroid injection may be limited to the short term.

**Keywords:** Tennis elbow, steroid, pain

## INTRODUCTION

Tennis elbow is a condition, characterised by pain and tenderness over the lateral epicondyle of the humerus, and pain on resisted dorsiflexion of the wrist, middle finger, or both. The other names for this condition are lateral epicondylitis, peritendinitis of the elbow, lateral elbow pain, tendonitis of the common extensor origin, and rowing elbow.<sup>1</sup>

Tennis elbow affects 1–3% of population.<sup>2</sup> The reported incidence among tennis players is 5–8%.<sup>3,4</sup> Tennis elbow can develop during activities requiring repetitive pronation and supination of the forearm with elbow in near full extension. It starts as micro tear mainly in the origin of extensor carpi radialis brevis. The microscopic appearance is that of immature reparative tissue resembling angio-fibroblastic hyperplasia. The pathological process usually involves the origin of extensor carpi radialis brevis but can involve the tendons of extensor carpi radialis longus and extensor digitorum communis.<sup>5</sup> The tendon fibres attached to the periosteum over lateral epicondyle are relatively avascular and are subjected to ischemic stress and thus slow to heal.<sup>6</sup> Many authors did not find evidence of inflammation in chronic tennis elbow and it was suggested that the term epicondylosis should be used instead of epicondylitis.<sup>7</sup> Local pathology consists of degeneration, disorganised collagen and neovascularity.<sup>8</sup>

The exact cause of pain and degeneration in these patients is not clearly known, neural, vascular or

healing failure has been proposed.<sup>9</sup> The diagnosis is made on clinical examination by localising tenderness over lateral epicondyle about 5 mm distal and anterior to the condyle. Pain increases with resisted dorsiflexion of wrist and supination of forearm and there is pain on grasping objects. Plain radiographs are normal. MRI shows tendon thickening with increased T1 and T2 signals.<sup>5</sup> The condition is self-limiting, commonly seen in 4<sup>th</sup> decade of life. On an average, a typical episode of lateral epicondylosis lasts 6–24 months. The cost is high in terms of reduced productivity and use of healthcare.<sup>10</sup> Treatment options include, rest, ice application, physiotherapy, bracing, and local steroid injection.<sup>5</sup>

The aim of this randomised controlled trial was to investigate the short term efficacy of local steroid injection compared with oral and topical NSAIDs.

## MATERIAL AND METHODS

The patients reporting at Out-patients Department at Liaquat University of Medical and Health Sciences Jamshoro and a private practice setup between January 2010 and July 2011 were included. The inclusion criteria was adults patients presenting with pain in the lateral part of elbow on resisted dorsiflexion of wrist with elbow extended and fingers flexed. Diagnosis of tennis elbow was made on clinical examination. The patients with more than 3 months of complaints duration and those recently treated with corticosteroids or physiotherapy were excluded. Also patients treated for elbow pain during the past 6 months, bilateral elbow involvement, cervical radiculopathy, other elbow joint

pathology, peripheral nerve disease, previous history of elbow fracture or dislocation, and contraindication of corticosteroid use were excluded.

Sixty patients (45 male and 15 female) were included in study. The mean age was 42 years for male and 40 years for female. Thirty patients (23 men and 7 women) were placed in group A, and 30 patients (22 men and 8 women) were placed in group B. Group A received local steroid injection (triamcinolone 20 mg mixed with injection lignocaine 2% 1 cc) and topical NSAID cream application (diclofenac diethylammonium) twice a day, tab diclofenac sodium 50 mg twice a day for 3 weeks. Group B received tab diclofenac 50 mg twice a day, and topical NSAID cream application twice a day for 3 weeks. Patients were called after six and 12 weeks, and results were recorded.

Assessment of patients was made 3 times: first at the start of the study, second time after 6 weeks and third times after 12 weeks. A blinded assessor rated the elbow complaints of the patients using VAS (0=no severity, 1-3 mild, 4-6 moderate, 7-9 sever, 10=maximum severity). VAS was used to record the intensity of pain felt by patient at resisted dorsiflexion of wrist.

Data were analysed using SPSS-15. Qualitative data were presented as n (%) and  $\chi^2$  test was applied to compare the proportions between groups. The continuous variables were presented as Mean±SD and Student's *t*-test was used to compare the means between groups. Data were calculated on 95% confidence interval and  $p < 0.05$  was considered as statistically significant.

## RESULTS

Sixty patients (45 male and 15 female) were included in study. The mean age was 42 years for male and 40 years for female. Thirty patients (23 men and 7 women) were placed in group A, and 30 patients (22 men and 8 women) were placed in group B.

Right side (dominant hand) was affected in 48 patients and left side (non dominant) was affected in 12 patients. Occupational distribution of males was: 18 labourers, (farmers, manual labourers, shopkeepers) 22 office workers (clerks, managers, computer operators), 5 surgeons. The occupational distribution for female was: housewives 8, office workers 2, and house-maids 5.

At the start of study, eleven patients in each group had moderate pain (VAS 4-6), and nineteen patients in each group had sever pain (VAS 7-9).

At six weeks significant difference was detected between group A and B. On physical examination 22 (73.33%) patient in group A had no pain compared to 7 (23.33%) patients in group B who were pain free ( $p < 0.0001$ ,  $\chi^2 = 38.75$ ). In group A, on physical examination, 22 (73.33%) patient felt no pain on dorsiflexion of wrist against resistance, and 8 (26.7%) of

patients had mild pain. In group B, on physical examination, 7 (23.33%) patients felt no pain on dorsiflexion of wrist against resistance, 6 (20.0%) complained of moderate pain, and 17 (56.7%) severe pain on dorsiflexion of wrist against resistance.

At 12 weeks, 27 (90%) patients in group A were pain free compared to group B in which 7 (23.33%) patients were pain free ( $p < 0.0001$ ,  $\chi^2 = 27.56$ ). In group A, 3 (10%) of patients showed recurrences and were injected again, while 27 (90%) had no pain. In group B, 7 (23.33%) patients felt no pain on dorsiflexion of wrist against resistance, 6 (20.0%) complained of moderate pain, and 17 (56.7%) had severe pain on dorsiflexion of wrist against resistance. The results in group B were similar as at 6 weeks (Table-1, 2)

Loss of skin pigmentation in 4 patients and atrophy of subcutaneous tissue in 2 patients was reported in group A.

**Table-1: Visual analogue score of groups (n=60)**

Variable	Group A (n=30)	Group B: (n=30)	$\chi^2$	df	<i>p</i>
<b>Baseline Visual analogue scale:</b>					
4-6 (Moderate Pain)	11 (36.7%)	11 (36.7%)	0.00	1	0.99
7-9 (Severe pain)	19 (63.3%)	19 (63.3%)			
<b>Visual analogue scale at 6 weeks:</b>					
0 No pain	22 (73.3%)	7 (23.3%)	38.75	3	<0.0001
1-3 Mild Pain	8 (26.7%)	0			
4-6 Moderate Pain	0	6 (20.0%)			
7-9 Severe pain	0	17 (56.7%)			
<b>Visual analogue scale at 12 weeks:</b>					
0 (No pain)	27 (90.0%)	7 (23.3%)	27.56	2	<0.0001
4-6 Moderate Pain	0	6 (20.0%)			
7-9 Severe pain	3 (10.0%)	17 (56.7%)			

**Table-2: Visual analogue scale of groups at 0, 6, 12 weeks (n=60)**

Visual analogue scale	Group A (n=30)	Group B (n=30)	<i>t</i>	df	<i>p</i>
Baseline	6.86±1.13	6.97±1.21	-0.329	58	0.74
After 6 weeks	0.66±0.15	5.56±3.24	-7.792	58	<0.0001*
After 12 weeks	0.73±0.24	5.56±3.21	-6.756	58	<0.0001*

Results are presented as Mean + Standard Deviation, \**p* value is statistically highly significant calculated by student *t*-test

## DISCUSSION

Various clinical studies have reported the incidence of tennis elbow to be 1-3%. It is the disease of 4<sup>th</sup> decade.<sup>11</sup> Both genders are equally affected. Some studies show those males are more affected. In our study the patients affected were in the early forties, both genders were affected, with men almost 3 times more than women. The dominant side was affected in most of the patients. This finding is consistent with other studies.<sup>12</sup> Many methods have been used for treatment of this condition. Vicenzino B<sup>13</sup> found benefit in elbow manipulation and exercise for this condition.

Haker *et al*<sup>14</sup> compared local corticosteroid injection with epicondylitis bandage and splinting. The results for steroid injection were better in two weeks time, but recurrence was detected in 44% of patients in 6 months, and the results of physical examination were similar in both groups at 12 months. Smidt N *et al*<sup>15</sup> reported that corticosteroid injections were more effective in 3–6 weeks time compared to controls or drugs group but at 3–12 months the results of injection were not better than control. They also found that massage, ultrasound, and exercise programme was not different form control.

Bisset *et al*<sup>16</sup> reported that local corticosteroids are effective in short term but the results were worst as compared to the other treatment modalities, e.g., physiotherapy and wait and see strategy in long term.

Our observation was that the combination of treatment in which local steroid injection was used, gives very good results. Other workers have reported that the good results of steroids are temporary and have possible adverse effects on tendons.<sup>17</sup>

In our short term study, the pain relief and improved function lasted up to 12 weeks in 90% of patients in group A compared to group B in which the relief was seen in 23.33% patients. The pain relief experienced by patients receiving local steroid was significantly better than those not receiving local steroids. We found that corticosteroid injection adds to the effect of pain relief of oral and topical anti-inflammatory drugs. Using local corticosteroids injection for early pain relief was beneficial.

## CONCLUSION

In patients with tennis elbow, use of local steroid injection in combination with topical and oral NSAIDs is superior to combination of topical and oral NSAIDs. Better results with combination therapy using local steroid injection may be limited to the short term.

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