

## Original Article

## EFFICACY OF PERIARTICULAR SODIUM HYALURONATE INJECTION IN LATERAL EPICONDYLITIS OF HUMERUS

Imran Shabir Mughal, Rana Dilawaiz Nadeem and Omer Iqbal Cheema

**Objective:** To determine the efficacy of periarticular sodium hyaluronate injection in terms of improvement of pain in lateral epicondylitis of humerus.

**Material and Methods:** This descriptive case series study was conducted for period of 6 months at Department of Orthopaedic Surgery at Services Hospital, Lahore. Through non-probability consecutive sampling, One hundred patients fulfilling the inclusion/exclusion criteria were selected from outpatient department and informed consent was taken.

Sodium hyaluronate injection was administered into the subcutaneous tissue and muscle 1 cm from the lateral epicondyle of humerus towards the primary point of pain using a two dimensional fanning technique. Patients were followed up in outpatients department for assessment of improvement in pain utilizing visual analog scale (VAS) at an interval of 4 weeks. Treatment was declared effective when the Visual Analog Scale (VAS) was found to be 0-3 i.e. no or mild pain. Paired sample t-test was used for pain comparison at baseline and at 4 weeks and 5% level of significance was used.

**Results:** A total of 100 patients consisting of 48 females and 52 males were enrolled who were diagnosed with lateral epicondylitis. Mean age of patients was  $42.16 \pm 6.78$  years with minimum and maximum age of patients was 31 and 58 years respectively. Periarticular sodium hyaluronate injection was effective among 75(75%) patients.

**Conclusion:** Periarticular sodium hyaluronate injection is an effective method of treatment in lateral epicondylitis of humerus.

**Key words:** Hyaluronate, two dimensional fanning technique, Lateral epicondylitis, Tennis elbow.

### Introduction

Lateral epicondylitis of humerus (Tennis elbow) is soreness, pain or inflammation on the outside or lateral side of the upper arm.<sup>1</sup> It is a term frequently used for a condition caused by overuse of arm and forearm muscles that results in elbow pain. This is a significant problem in tennis players.<sup>2</sup> Incidence of lateral epicondylitis is reported to be 0.6 in general population and 9% in tennis players. Currently there is no consensus on the treatment but the non-surgical treatment is the mainstay of treatment. Multiple options are available including RICE (rest, ice, compression and elevation), oral or topical NSAIDs, bracing and physical therapy<sup>3</sup>, and local modalities like extracorporeal shock wave therapy (ESWT).<sup>4</sup> Previous studies with NSAIDs and botulinum toxin injection were associated with adverse effects like rash, mild gastric upset, digital paresis and weakness of finger extension.<sup>5,6</sup> Surgery is mainly reserved for the resistant cases and options include open, percutaneous and arthroscopic procedures. Multiple procedures are described which include Boyd McLeod procedure, Nirschl

procedure, knife and fork day case surgery, open release of common extensor origin, fractional lengthening of forearm extensors, open and percutaneous tenotomy and excision, release and repair of common extensor origin and extensor carpi radialis brevis debridement.<sup>7-14</sup>

This study was designed to determine the efficacy of periarticular sodium hyaluronate injection in lateral epicondylitis of humerus. Importance of the study lies in the fact that no local data is available regarding the use of hyaluronate injection in this condition. Study compares and highlights the efficacy of hyaluronate injection which is also virtually free from the side effects common among the other modalities being utilized.

### Materials and Method

This descriptive case series was conducted at Department of Orthopaedic Surgery, Services Hospital, Lahore. Non probability consecutive sampling technique was used. Patients, both males and females, age between 30 to 60 years having

Symptoms for more than 6 months, with the diagnosis of lateral epicondylitis were included in this study with Visual Analogue Score (VAS)

≥ 4. Patients having coexisting arthralgia or arthritis of elbow or radioulnar joint, Radial tunnel syndrome, varus instability of elbow, coexisting medial epicondylitis all assessed clinically, or any history of use of any medicine or product containing corticosteroids in past 30 days on available medical record were not included in this study.

One hundred patients were selected after informed consent. A detailed history was taken. Demographic data including age, gender, address, occupation and hand dominance was recorded. A detailed examination was carried out and baseline pain score was noted using VAS. Under aseptic conditions, 20mg/2ml sodium hyaluronate injection was administered into the subcutaneous tissue and muscle 1 cm from the lateral epicondyle of humerus towards the primary point of pain using two dimensional fanning technique. Patients were treated on outpatient basis and were advised to avoid any activities that aggravate the symptoms. Patients were followed up in outpatients department at 4 weeks and were assessed for pain intensity using VAS.

Data collected was entered and analyzed by using SPSS version 17. Variables were analyzed using simple descriptive statistics, calculating mean ± standard deviation for numerical values like age. Frequencies and percentages were calculated for qualitative variables like gender and efficacy. Paired sample t-test was used to see the effectiveness of treatment at 5% level of significance.

**Results**

Mean age of patients was 42.16±6.78 years with minim and maximum age of patients being 31 and 58 years respectively. Mean age of male and female patients was 42.48±6.75 and 41.81±6.86 years respectively. Minimum and maximum age of male patients was 32 and 58 years and of female patients was 31 and 58 years respectively. Gender distribution of patients shows that there were 48(48%) female and 52(52%) male patients. There were 93 patients whose right side were effected and in only 7 patients left side was effected. Pain intensity was assessed by using visual analogue scale (VAS) scale. Pain intensity was assessed at two intervals i.e. on base line and at 4 week after the procedure. Mean pain intensity at base line was

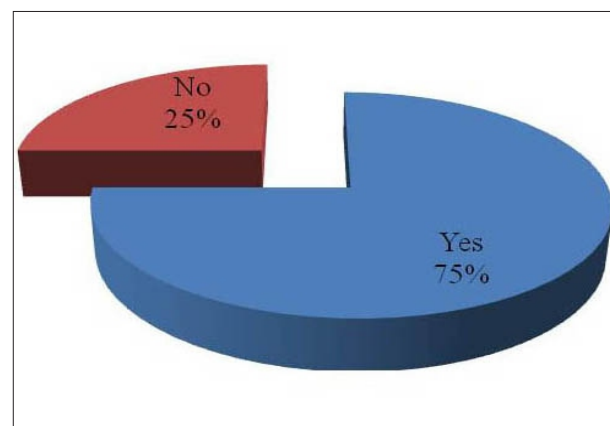
7.75±1.35 and at 4th week it was 2.12±1.97. Using paired sample t-test it was concluded that there was a significant mean pain reduction at 4th week as compared to baseline pain, i.e. p-value = 0.000 (Table 1). Periarticular sodium hyaluronate injection was effective among 75(75%) patients (Fig. 1). Among male patients effectiveness was observed in 35(67.3%) and in female patients effectiveness was observed in 40(83.3%) patients at 4th week post procedure.

**Table-1:** Descriptive statistics for age (years) and pain .

	Gender		Total
	MALE	Female	
N	52	48	100
Mean	42.48	41.81	42.16
Std. Deviation	6.75	6.86	6.78
Minimum	32.00	31.00	31
Maximum	58.00	58.00	58

**Table-2: ??**

	Base Line	4th Week
N	100	100
Mean	7.75	2.12
Std. Deviation	1.35	1.97
Minimum	5.00	.00
Maximum	10.00	7.000
P- value	0.000 (significant)	



**Figure-1:** Effectiveness of treatment.

**Discussion**

Tennis elbow is a benign self-limiting condition which improves in 70% to 80% of patients with or without treatment within 12 months but it is a long time for a patient to wait not only in terms of pain and disability,

but also results in loss of economic productivity. What patients often require is a safe, minimally invasive procedure that will enable them to return to their daily activities as soon as possible.<sup>15</sup>

In this study, mean age of patients was  $42.16 \pm 6.78$  years which is in accordance with the other studies where mean age is in the fifth decade of life<sup>3,16</sup>. Present study also showed a male dominance as it had 52 males as compared to 48 female patients, which is not in accordance with some of the studies which have shown this condition to be more prevalent in the female gender.<sup>16</sup>

This study shows that 93 patients had right sided involvement as compared to only 7 patients with left sided involvement. Right side involvement showed predominance over left side. This right sided dominance has already been shown in a study conducted by Shiri R et al.<sup>17</sup>

Study demonstrated the effectiveness of the modality in 35(67.3%) males and 40(83.3%) female. This is probably due to the fact that hyaluronate injection produces pain relief and this is followed by immediate resumption of heavy activities by men leading to recurrence of symptoms.

Many treatments have been proposed leading to a number of trials and reviews including several recent meta-analyses but have led to no conclusions as to which is the best. The NSAIDs and botulinum toxin injection were associated with adverse effects like rash, mild gastric upset, digital paresis and weakness of finger extension.<sup>5,6</sup> Smidt et al reviewed literature on physical therapy and found no evidence of effect, with the exception of ultrasound, where a

minor effect was shown.<sup>18</sup> Bisset et al published a meta-analysis of 28 randomized studies of different physical therapies for lateral epicondylitis, most studies had a small number of subjects and only eight had long term follow-up of effect of therapy, they found effectiveness of corticosteroid injections or physiotherapy over the modality of wait and see. However, the benefits of corticosteroid injection were short term and were paradoxically reversed after six weeks.<sup>19</sup> Some authors noted that patients who received ESWT had improved symptoms.<sup>4</sup> Side effects from this treatment included transient reddening of the skin, pain at the site of the treatment, small hematomas, migraines, and syncope.<sup>20</sup>

Hyaluronate is a naturally occurring biological agent and is relatively free of these side effects.<sup>21</sup> A recently carried out study has shown an effectiveness in 89% of patients after two injections.<sup>3</sup> However, present study has a success rate of 75% with single injection of sodium hyaluronate.

## Conclusion

Results of this study confirmed the efficacy of periarticular sodium hyaluronate injection in lateral epicondylitis of humerus. Now we can recommend that periarticular sodium hyaluronate injection is an effective way of management in patients with lateral epicondylitis.

*Department of Orthopaedic Surgery  
SIMS/Services Hospital, Lahore  
[www.esculapio.pk](http://www.esculapio.pk)*

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