Original Article

"COMPARISON OF MEAN PAIN SCORE OF THE LOCALLY INJECTABLE CORTICOSTEROID AND COMBINATION OF ORAL AND TOPICAL NON-STEROIDAL ANTI-INFLAMMATORY AGENTS FOR THE TREATMENT OF TENNIS ELBOW"

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ABSTRACT

INTRODUCTION: Tennis elbow is a condition characterized by pain and tenderness over the lateral epicondyle of the humerus and pain on resisted dorsiflexion of the wrist, middle finger or both.[1] Tennis elbow is a common musculoskeletal condition affecting 1% to 3% of the adult population.[2] It is a common condition that usually affects patients between 30 and 50 years of age. So far, there are numerous treatment options available to control the symptoms of this condition, like the use of NSAID's drugs, injectable corticosteroids, exercises, and physiotherapy etc . However, none of these provide satisfactory results.[5] Results of this study will help to adopt the most appropriate treatment option for the patients with tennis elbow to reduce their symptoms and morbidity.

Objectives: To compare mean pain score of locally injectable steroid and the combination of oral and topical non-steroidal anti-inflammatory agents for the treatment of tennis elbow.

MATERIALS & METHOD

Study Design: Randomized control trials

Setting: The study was conducted at Orthopedic Departments Punjab Medical College and Affiliated Hospitals Faisalabad.

Duration of Study: 05-01-2014 to 04-07-2014 (Six months)

Results: Out of 60 cases 38 (63.3%) were males and 22 (36.7%) were females. Mean age was 43.07±7.40 years. Mean VAS in group A after 6 weeks of treatment was 5.87±1.008 and in group B it was 0.83±0.648 (p= 0.0001).

Conclusion: This study shows that the locally injectable corticosteroids are an excellent method for relieving symptoms in patients with tennis elbow as opposed to a combination of topical and oral NSAID's.

Keywords: Tennis elbow, Visual analogue score (VAS), NSAID's, Lateral epicondyle

INTRODUCTION:

Tennis elbow is a condition characterized by pain and tenderness over the lateral epicondyle of humerus and pain on resisted dorsiflexion of the wrist, middle finger or both.[1] Tennis elbow is a common musculoskeletal condition affecting 1% to 3% of the adult population.[2] Although, tennis elbow affects people of all ages but the most common age affected by this condition is 30 to 50 years. The symptoms of the patients vary depending on the age, occupation, functional status of body and level of repetitive activities. It is generally self-

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limiting, but in some patients, it may continue to cause persistent symptoms, which can be refractory to treatment.[3] The repetitive movements at the elbow and the wrist joints is the main pathological mechanism which leads to the microscopic tears and inflammation on the attachment site of the extensor carpi radialis tendon at the lateral epicondyle of the elbow. Similar to supraspinatus tendinitis, it may result in small tears, fibrocartilaginous metaplasia, microscopic calcification and a painful vascular reaction in the tendon fibres close to the lateral epicondyle.[4]

So far, there are numerous treatment options available to control the symptoms of this condition, like the use of NSAID's drugs, injectable corticosteroids, exercises, and physiotherapy etc . However, none of these provide satisfactory results.[5] It is important to note that 90 percent of 'tennis elbows' will resolve spontaneously within 6–12 months.[6]

A comparative study of the local injection of corticosteroids and combination of topical and oral NSAID's for tennis elbow showed the mean pain score on Visual Analog Scale to be 0.66±0.15 for local injection of steroid and 5.56±3.24 for combination of topical and oral NSAID's after 6 weeks of treatment.[1]

Although numerous treatment options are available for the lateral epicondylitis, but the selection of a suitable treatment option for such patients can be thought-provoking. In this study, tennis elbow is treated with oral and topical NSAID's and local injection of steroids. Results of the study will help to adopt the most appropriate treatment option for the patients with tennis elbow to reduce their symptoms and morbidity.

RESULTS:

Out of 60 patients collected through OPD of Allied Hospital Faisalabad (Punjab Medical College), patients were divided into two groups A and B. Group A includes the patients who were given Tablet Diclofenac sodium 50 mg twice a day along with topical NSAID's cream for application twice a day for three weeks, whereas group B includes the patients who were given locally injectable corticosteroids.

Out of 60 patients, there were 38 (63.3 %) males and 22 (36.7%) females. In group A, there were 17 (56.7%) males and 13 (43.3%) females. In group B, there were 21 (70%) males and 9 (30%) females (Table no.1, Graph no. 1).

Out of 60 patients, the right hand was involved in 51 (85%) patients while left hand was involved in 09 (15 %) patients. Right side involvement in patients with group A is 26 (86%) & in group B is 25 (83%). The left side involvement in patients with group A is 04 (13.3%) & in group B is 05 (16.7%) (Table no. 2, Graph no. 2).

Out of 60 patients, the minimum age was 25 years while maximum age was 60 years. Mean age was 43.07±7.40 years (Table no. 3).

In group A, the minimum age was 30 years while maximum age was 60 years, while mean age was 43.03±7.76 years. In group B, the minimum age was 25 years while maximum age was 55 years, mean age in group B was 43.10±7.16 years (Table no.4).

Mean Visual Analogue Score at the start of treatment in group A was 6.83±1.17 and in group B it was 6.93±1.285. There is no significant difference between the two groups (p- value= 0.749). Mean Visual Analogue Score after 6 weeks of treatment in group A was 5.87±1.008 and in group B it was 0.83±0.648. There is a significant difference between two groups (p-value= 0.0001) (Table no. 5).

Table N. 1 Distribution of gender between two groups

		Groups		
		Group A	**Group B**	**Total**
Gender	**Male**	17 (56.7%)	21 (70%)	38 (63.3%)
	Female	13 (43.3%)	9(30%)	22 (36.7%)
	Total	30	30	60

Table No.2 Side Involvement in Both Groups

		Groups		
		Group A	**Group B**	**Total**
Side Involved	**Right**	26 (86.7%)	25 (83.3%)	51 (85%)
	Left	4 (13.3%)	5 (16.7%)	9 (15%)
	Total	30	30	60

Table No.3 Mean Age

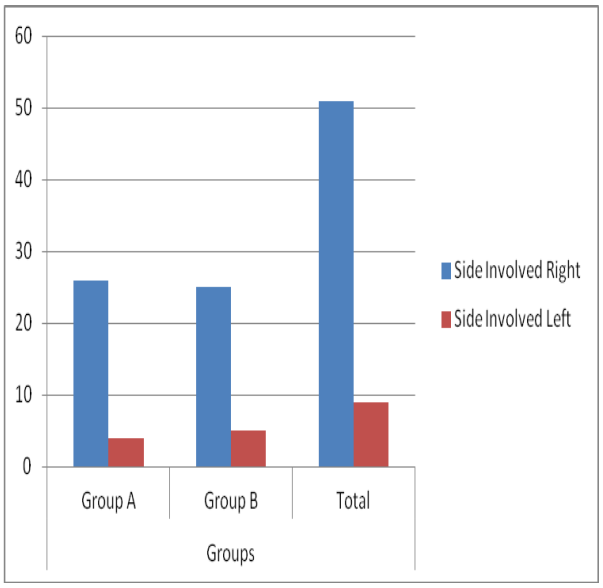
	n	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
AGE	60	25	60	43.07	7.40

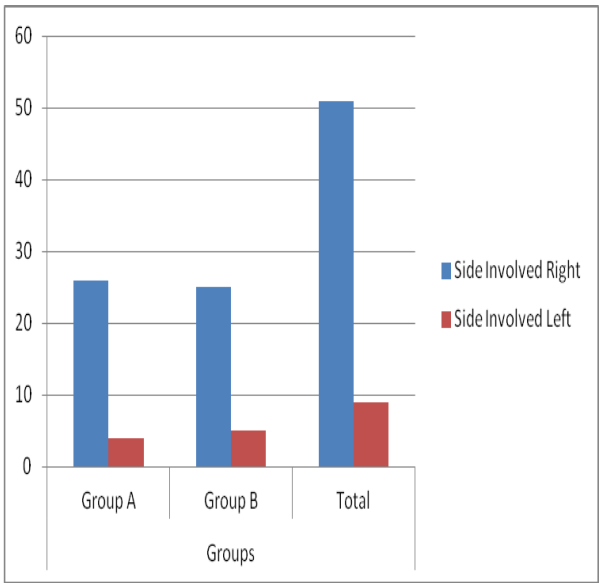
Table No. 4 Mean and Standard Deviation in Each Group

Group	**n**	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Group A age	30	30	60	43.03	7.76
Group B age	30	25	55	43.10	7.16

Table no.5 VAS at start and 6th week of treatment

Variable	**Group**		**Independent Variable t-test p-Value**
	Group A	**Group B**	
VAS at baseline	6.83±1.117	6.93±1.285	0.749
VAS at 6th week	5.87±1.008	0.83±0.648	0.0001
Paired sample t-test p-Value	0.0001	0.0001	





Graph No. 1 Distribution of gender between two groups

Table no.2 Side Involvement in Both Groups

DISCUSSION:

Tennis elbow is the most common musculoskeletal cause of elbow pain. It usually affects 1 to 3 % population worldwide.[2] It usually affects both males and females. Overall the incidence is more in female population affecting 1.1-4.0% in women as compared to males 1.0-1.3% .[7] Tennis elbow affects patients usually between 30-50 years of age.[8] The dominant arm is affected more than the non-dominant arm. Extensor carpi radialis brevis (ERCB) seems to be pathognomonic in tennis elbow. Formerly it was considered to be an inflammatory condition; however, new studies have proven the tennis elbow to be a non-inflammation condition. Usually, it is a self-limiting condition as most of the patients improves within 6 to 12 months. Surgical treatment is recommended for those patients who do not respond to 6-12 month conservative treatment.

Although there are many conservative treatments available; however, there is no consensus to which treatment modality is used. Till date, the conservative treatment with topical and oral NSAID's, local corticosteroid injection, extracorporeal shock wave therapy, Botulinum toxin injection, Autologous blood injections, Platelet-rich plasma injection, Acupuncture, Ultrasound, Laser, and Radiotherapy are used. Surgically, it is treated with the Percutaneous release of the extensor origin, Lengthening the ECRB tendon, The traditional open debridement technique, Combined common extensor and supinator aponeurotomy, Denervation of the lateral humeral epicondyle, Epicondylectomy, and Arthroscopic procedures.

Locally injectable corticosteroids provide sustained pain relief while the other treatment modalities of conservative management give temporary pain relief and have different limitations. The local corticosteroid injection therapy is cost effective as compared to NSAID's. The corticosteroid injections are cheap and used only once while the NSAID's therapy must be continued for 6 weeks, increasing cost and decreasing patient compliance due to the long length of treatment. High cost and increased side effects such as skin rash in case of topically applied NSAID's and stomach pain and diarrhea in patients taking oral NSAID's may also become a concern.

Extracorporeal shock wave therapy (ESWT) is a new modality for the treatment of tennis elbow. The author found conflicting results for its effectiveness in the management of tennis elbow, since it is a dose dependent modality and the optimal effective dose has not been discovered.[9] If we compare the cost of a single course of ESWT with glucocorticoid injection, it costs about £300 while a single injection of glucocorticoid costs about £3.[10] whereas electromagnetic and piezoelectric devices routinely require three to six treatments.[11] In the study conducted by Radwan et al, some adverse effects of ESWT such as paresthesia and myalgia were discovered in some patients.[11]

Hayton MJ et al did not find any evidence of the effectiveness of Botulinum toxin injection for the treatment of chronic tennis elbow.[12] Zhang et al observed that there were a general dose-dependent and temporal response with BoNTA injections.[13]

Comparison of a single injection of platelet-rich plasma and corticosteroid injection was done and it was found that 49% of patients improved in their pain score as compared to 73% patients treated with platelet-rich plasma only. However, the manner in which the platelets are harvested, the concentration of injectable solution, presence of leukocytes, and whether the platelets are activated prior to injection is not clear.[14]

Comparison of ultrasound, diathermy and manipulation and the corticosteroid injection was done by Sinclair in 1965 and found 51.4% recovery rate in case of ultrasound, 84.6% for combination of ultrasound and diathermy and 91% for the corticosteroid injection.[15]

Brattberg in 1983 conducted a comparative study of acupuncture and the corticosteroid injection and found 62% success rate in case of acupuncture and 18% with the corticosteroid injection. However, the quality of the study was poor because the variables were not operationalized; selection was biased due to non-probability of the sample. Also, there was a possibility of type 1 error.[16]

Smidt N et al found a significant improvement in pain with the use of locally injectable corticosteroids in short-term follow-up. The results were compared with physiotherapy and a wait-and-see policy revealing a significant difference in terms of pain relief. The success rate at 6 weeks was 92% for the corticosteroid injections, 48% for physiotherapy, and 33% for the wait-and-see policy.[17] These findings are consistent with this study. They also noted some adverse effects for the use of corticosteroid injection which were radiation of pain to forearm or upper arm in 27%, facial flush in 3%, skin irritation in 5%, red swollen elbow in 3%, change of skin colour in 11%, and other minor or temporary adverse reactions 13%.

In one study, the comparison of locally injectable corticosteroids and physiotherapy was performed and showed good to excellent results after six weeks of corticosteroid injection, however, in long-term follow-up; the recurrence of pain was high with the corticosteroid injection (34%).[18]

Jafarian FS et al, found no significant improvement in the grip strength with the use of orthoses when compared to placebo group.[19]

Most studies have claimed excellent results with the corticosteroid injections therapy in a short-term follow-up (Hohl 1961; Valtonen 1967; Hughes and Currey 1969; Clarke and Woodland 1975; Day et al 1978; Nevelos 1980). At six months, however, all reported a high recurrence rate, about 66% in one group of patients.

This study showed very good results of the locally injectable corticosteroids, however, Toker S et al found that the pain relieving effect of the corticosteroids is of short duration, and the corticosteroids have possible adverse effects on the tendons.[20] The corticosteroids had been declared the mainstay of conservative treatment while on the other hand, possible recurrence of symptoms and adverse effects of the corticosteroids on the tissue also made them the most controversial treatment option.[21]

Kay in 2003, showed disappointing results of surgery for tennis elbow. Of the patients who were operated on, 50% stopped working, 29% changed jobs, and 9% retired. Only 12% returned to their preoperative employment.[16] After this study, Kay declared that surgery is not a suitable option of treatment for the patients with tennis elbow.

If we consider all the methods of treatment are equally effective, then the type of procedure should be least invasive, cost effective and time efficient. The corticosteroid injections are least invasive, cost effective, need only a few minutes for injection application, no repetitive visits are required in comparison to physiotherapy or surgery. Because of effective pain relief, decreased hospital visits and no major adverse effects, the corticosteroid injection should be recommended as the most efficient method of treatment for tennis elbow.

In view of these results, there is no reason to believe that NSAID's are not an adequate treatment for patients with a short duration of symptoms at presentation. The pros and cons of available treatment options for tennis elbow should be discussed with the patients. The corticosteroids might be appropriate for rapid relief of symptom; however, long-term use of the corticosteroids should be discouraged due to poor outcome.

CONCLUSION:

This study shows that the locally injectable corticosteroids are an excellent method of treating tennis elbow. There are quick pain relief and early return to daily activities. Mean pain score is effectively reduced if topical NSAID's are used along with the local corticosteroid injection. This study also concludes that the locally injectable corticosteroids are cost effective and the procedure can be performed as an outpatient procedure.

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