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Tennis Elbow – Efficacy of local Corticosteroid injection in its Management

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Abstract
Background: *Tennis elbow is a common clinical problem familiar to orthopaedic surgeons. Its etiology and management remains controversial, reflected by the fact that more often it runs a chronic course. This study was designed to know the effectiveness of a local corticosteroid injection in its management.*
Materials and Methods: *sixty-eight patients (median age, 38 to 41 years), presenting with pain on the lateral side of the elbow for a duration of more than six weeks were enrolled for the study. Patients were consecutively allotted to treatment with corticosteroid injections (Group I, n = 34) or oral analgesics and physiotherapy (Group II, n = 34). Injection of 1 ml of triamcinolone acetonide (10 mg) mixed with 1 ml of 2% lidocaine were given at the site of maximum tenderness for patients in group I. Oral Acetaminophen (1000-2000 mg/day), Ibuprofen (800-1200 mg/day), Diclofenac (100-150 mg/day) or Physiotherapy and an exercise program were given to patients in group II. Results were evaluated based on severity of the elbow complaints, tenderness and cozen's test at six weeks follow-up and compared to the baseline clinical features at presentation.*
Results: *The incidence was more in the third decade 35.3% (n=24), with female preponderance 64.7% (n=44) and the dominant arm being more commonly involved 55.9% (n=38). Excellent results were found in group I in n=19 (55.9%) whereas poor results were more in group II in n=20 (58.8%). Group I had poor result only in n=04 (11.8%) of patients who later underwent further surgical intervention.*
Conclusion: *Local corticosteroid injections are the most effective treatment for tennis elbow at six weeks and cause early resolution of symptoms.*
Keywords: *Tennis elbow, Lateral epicondylitis, Steroid injection, Elbow pain.*

I. Introduction

Tennis elbow is a common cause of elbow pain in the general population. 50% of persons who play tennis regularly will develop lateral elbow symptoms at some point during their careers. Its specific etiology is still uncertain. The initial description of this condition goes back more than a century. It was named "lawn-tennis arm" by Major[1] in 1883 due to its association with the sport. Men and women are affected equally, with symptoms more commonly seen in the dominant arm. The onset of symptoms is attributed to overexertion of the extremity with repetitive wrist extension and alternating forearm pronation-supination. Risk factors include a history of manual labour with heavy tools and significant strain while performing repetitive tasks.[2] There is no consensus on its single effective and consistent management. We report a prospective case series of sixty-eight patients, where we evaluated the efficacy of local corticosteroid injection and compared it with other standard conservative measures.

II. Materials And Methods

This is a prospective randomized study of sixty-eight patients presenting with elbow pain of duration ranging from six to sixteen weeks. The most consistent complaint was of elbow pain leading to impairment of daily activity. Most of them had taken some form of local treatment in the form of massage or icing. All patients were counselled about the treatment options, their advantages, disadvantages, natural history of the condition and informed consent was obtained.

Inclusion criteria:

All patients with pain on the lateral side of the elbow that increased with pressure on the lateral epicondyle and Cozen's test positive were included in the study. Cozen's test was performed by asking the patient to hold the limb with elbow semiflexed and forearm pronated and then dorsiflex the wrist against resistance applied by the examiner. Severe pain at the lateral aspect of elbow is interpreted as positive test.

Exclusion criteria:

Patients with duration of pain less than 6 weeks, elbow deformities, musculoskeletal or neurological disorders, history of treatment with corticosteroids or contraindications to corticosteroids were excluded.

Treatment Modality:

Group I, Corticosteroid group (n=34): Injection of 1 ml of triamcinolone acetonide (10 mg) mixed with 1 ml of 2% lidocaine were given at the site of maximum tenderness.

Group II, Conservative group (n=34): Patients were advised oral analgesic anti-inflammatory drugs like Acetaminophen (1000-2000 mg/day), Ibuprofen (800-1200 mg/day), Diclofenac (100-150 mg/day) or local application of ointment without massage along with rest in a brace. Physiotherapy in the form of pulsed ultrasound, deep friction massage and an exercise program were given.

Follow-up:

Patients were reassessed at the end of two and six weeks. Results were evaluated at the end of six weeks based on the criteria as in **Table 1**.

Table 1: Criteria for evaluation of Results

Result	Pain	Tenderness	Cozen's test
Excellent	Nil	Nil	-ve
Good	Nil	Deep	-ve
Poor	+ve / -ve	Superficial	+ve

III. Results

A total of 68 patients participated in the study of which 24 (35.3%) were male and 44 (64.7%) were female (**Table 2**). The condition is found to be more common in the age group of 30-39 years followed closely by 40-49 years, indicating high prevalence in third and fourth decade (**Figure 1**). Right side was affected in 55.9% (n=38) of patients and left side in 44.1% (n=30) of cases (**Table 3**), may be due to the fact that most of the people are right handed and tend to use their right hand more than their left (**Figure 2**). Result evaluated at the end of 6 weeks reveal excellent results in 55.9% (n=19) of group I patients, whereas only 14.7% (n=05) were excellent in group II (**Table 4**). 32.3% (n=11) had good results and only 11.8% (n=4) had poor results in group I, whereas 58.8% (n=20) had poor outcome from group II (**Figure 3**) and required other methods of treatment after 6 weeks of follow-up. Most of them were treated with local steroid injection after conclusion of the study.

Table 2: Age and Sex distribution of the study population

Age(yrs)	Male	Female	Total
<30	01	09	10
30-39	11	12	24
40-49	08	14	22
≥50	04	09	13
Total	24 (35.3%)	44 (64.7%)	68 (100%)

Figure 1: Age and Sex distribution of the study group

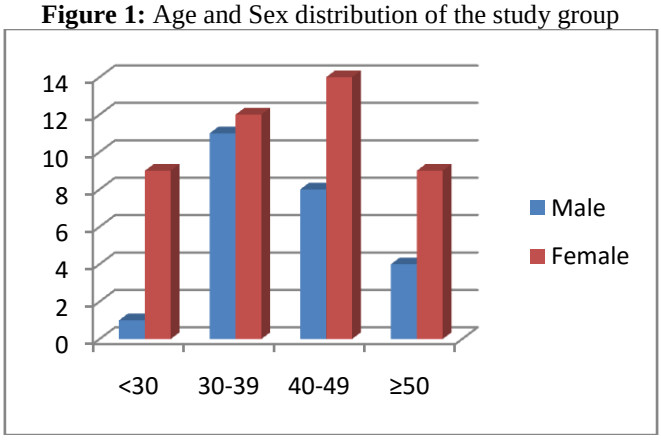


Table 3: Side distribution

Side	Male	Female	Total
Right	13	25	38
Left	11	19	30
Total	24	44	68

Figure 2: Side distribution

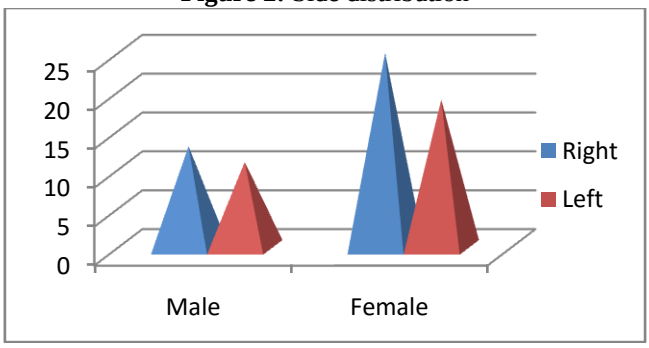
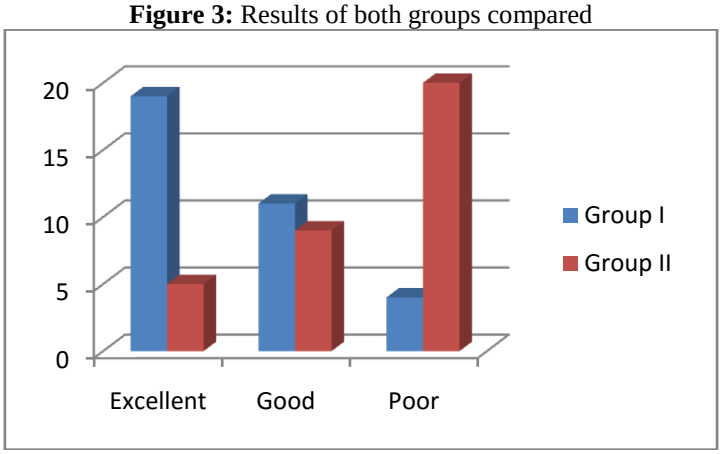


Table 4: Results of both groups compared

Result	Group I No. (%)	Group II No. (%)
Excellent	19 (55.9)	05 (14.7)
Good	11 (32.3)	09 (26.5)
Poor	04 (11.8)	20 (58.8)
Total	34 (100)	34 (100)

Figure 3: Results of both groups compared



IV. Discussion

Tennis elbow is a common source of morbidity in tennis players as well as the general population. The term 'Tennis elbow' is a too restricted title since it can occur very commonly in patients who have never played tennis. It occurs in response to the stress of overload and overuse. The repeated pronation-supination motion is apparently more important than the strength used to do the movement. Most patients with lateral epicondylitis will improve over time. Approximately 80% report symptomatic improvement at one year.[3] Poor prognostic factors include manual labour, dominant arm involvement and long duration of symptoms. [4]

The sources of pain generation in tennis elbow are varied. Both intra [8-10] and extra-articular structures may be responsible for symptoms. Refractory tennis elbow can be caused by compression of Posterior interosseous nerve in radial tunnel.[5] Increased activity of extensor carpi radialis brevis muscle, [6] and increased levels of the excitatory neurotransmitter [7] are demonstrated.

Clinical Features include pain over the lateral aspect of the elbow exacerbated by activities involving active wrist extension or passive wrist flexion with the elbow extended (Cozen's test). Maximal tenderness occurs slightly anterior and distal to the lateral epicondyle. It is rarely associated with swelling, erythema or warmth. Magnetic resonance imaging may demonstrate ECRB origin to be separated, thinned, or partially or completely torn. [11]

Differential Diagnosis:

- Radial tunnel syndrome
- Osteochondritis dissecans of capitellum
- Radial head arthrosis
- Lateral compartment arthritis
- Posterolateral elbow instability
- Posterolateral elbow plica
- Cervical radiculopathy
- Shoulder periarthritis

Management:

The most effective mode of therapy and treatment duration remains controversial.

Rest and Nonsteroidal Anti-inflammatory Drugs: Although lateral epicondylitis is characterized as a noninflammatory condition, NSAIDs may relieve pain from associated synovitis or acute inflammation in the surrounding supportive adipose, connective, and muscle tissue. [12] Rest relieves tendon strain and provides time for tendon healing.

Physical Therapy: Stretching of the extensor origin, ultrasound therapy, iontophoresis, electrical stimulation, soft-tissue mobilization, friction massage are other modalities of physical therapy.

Steroid Injection: Many studies have evaluated the efficacy of steroid injection versus NSAIDs and placebo. After a brief period of post injection discomfort, pain relief during early follow-up (5 days to 6 weeks) has been shown to be significantly better in the steroid group than in all others.[13] However, at longer followup (12 weeks to 12 months), results of those who received steroid injection were the same as those of the other treatment groups. Potential explanations for this are that the injections may have weakened the tendon itself or that the patients may have further aggravated the tendon during the relatively painless period early after the injection. [14] Altay et al found no difference in outcomes at one year when lidocaine injection (60 patients) was compared with lidocaine and steroid injection into the extensor origin (60 patients). [15]

Local corticosteroid injection is proved to be superior to Cyriax treatment, with a maximum of three injections during a period of one year. [16] Common side effects include skin depigmentation and fat atrophy. Steroids have also been shown to decrease collagen production as well as tenocyte replication.[17] Common extensor tendon rupture is also reported especially with repeated injections.[18]

Other Modalities:

- Botulinum toxin injection.[19]
- Autologous blood injection.[20]
- Platelet rich plasma (PRP) injection
- Arthroscopy offers several advantages as it allows intra-articular examination for other pathology and permits a shorter postoperative rehabilitation period and an earlier return to work when compared to open procedures.[9]
- Surgical debridement is indicated in the 5-10% of patients when functional disability and pain persist even after 6 to 12 months of nonsurgical management.

V. Conclusion

As a whole to conclude from our study, considering factors such as cost and time lost from work, a local Steroid injection for pain relief at acute presentation appears to be the best method to treat tennis elbow rather than an oral or physical approach.

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