TENNIS ELBOW - CRITICAL ANALYSIS OF VARIOUS CONSERVATIVE TREATMENT MODALITIES

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ABSTRACT

The purpose of this study was to evaluate the outcome of various conservative treatment modalities used in tennis elbow.

METHODS

AIM

Five commonly used conservative modalities were tested in fifty tennis elbow patients, i.e. 1. Ultrasonic therapy, 2. Inj. Methylprednisolone, 3. Inj. 50% Dextrose, 4. Inj. Autologous blood, 5. Inj. Platelet rich plasma. They were all periodically followed for one year. The final outcome was analysed with visual analogue pain score.

RESULTS

With ultrasonic therapy out of ten patients, six patients (60%) had improved from symptoms. Four patients did not get relief or improvement of symptoms even after four complete sittings of ultrasonic therapy. With injection Methylprednisolone, 70% patients had improved from symptoms; 30% of patients did not get relief; 80% of patients who received 50% dextrose injections had improved from symptoms and 20% of patients did not get relief of symptoms. Following autologous blood injections 90% of patients had improved from symptoms, but recurrences were noted. Following platelet rich plasma treatment, 90% of patients had improved from symptoms.

CONCLUSIONS

Platelet rich plasma injection seems to be the best method of conservative treatment for tennis elbow.

KEYWORDS

Tennis Elbow, Conservative Modalities, Ultrasonic Therapy, Methylprednisolone, Platelet Rich Plasma.

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INTRODUCTION

Tennis elbow is defined by lateral elbow pain on palpation of the common extensor origin and pain on resisted wrist extension. It is generally considered to be due to repetitive microtrauma from the overuse of wrist extensors and subsequent failure of the tendon to heal and the most common muscle found to be affected is Extensor Carpi Radialis Brevis, which is a part of Common Extensor Origin from lateral epicondyle. Tennis elbow is the most commonly diagnosed elbow condition.¹

The prevalence of tennis elbow is 1-2%, and the condition is mainly seen among middle-aged people and females.²⁻⁴ Although, it has a well-defined clinical presentation and there is an abundance of research on tennis elbow, the complexities of both the underlying aetiological and pathophysiological processes remain in contention. Specifically, whether an inflammation is an integral part of the pathogenesis.

Many of therapeutic interventions are available for the treatment of tennis elbow, of the comparatively a few randomised control trials which have been undertaken, no one proven treatment to be universally effective.⁵

Financial or Other, Competing Interest: None. Submission 01-07-2016, Peer Review 26-07-2016, Acceptance 01-08-2016, Published 22-08-2016. Corresponding Author: Kanniyappan Thanigaimani, #S8, Leo Block, V.G.N. Zodiac Ville, 62, Devadoss Street, V.G.N. Avenue, Phase 1, Mogappair West, Chennai-37. E-mail: orthomani2002@gmail.com DOI: 10.14260/jemds/2016/1094 Hence, this study was carried out to assess the results of different conservative modalities of management.

Study Subjects

Our study involved 50 patients with Tennis Elbow, treated conservatively in the Department of Orthopaedics from 1st January 2015 to December 2015 at Chengalpet Medical College, Chengalpet, Tamilnadu.

Study Type

This is a prospective descriptive study.

METHODOLOGY

Approval from the Hospital Ethical Committee was taken. Informed and written consent was taken from the patient. The conservative management given at the Outpatient Department. Then the patient followed in the Outpatient Department at weekly intervals till symptoms decreases and then followed up for 3 weeks, 6 weeks, 3 months, 6 months and 12 months interval depends on the compliance of the patient by visual analogue scale.

Criteria for Inclusion

- Pain on palpation of the common extensor origin on the lateral epicondyle.
- Pain elicited from the common extensor origin during resisted extension of the wrist.
- Age more than 18 years.

Exclusion Criteria

- Arthritis.
- Synovitis of proximal radio-ulnar joint.

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- Entrapment of radial nerve and posterior interosseous nerve.
- Generalised pain syndrome.
- Previous history of trauma or surgery in the region of the lateral epicondyle and common extensor origin.
- Other diseases like medial epicondylitis, impaired sensibility, paralysis, etc., that would affect the outcome measure.
- Those patients who lost for follow-up were also excluded from our study.

The Criteria for Diagnosing Tennis Elbow as Suggested by Garden⁶ in 1961 and followed in this Study were as follows

- 1. Local tenderness at the lateral epicondylar region.
- 2. Pain in the same region on resisted radial extension of the wrist.
- 3. Pain in the same region on the passive stretching of the forearm extensors.

Methods of Treatment

- Ultrasonic Therapy.
- Injection of Methylprednisolone (Depo-Medrol).
- Injection of 50% Dextrose.
- Injection of Autologous Blood.
- Injection of Platelet Rich Plasma.

Dosage of 50% Dextrose: Sterile aqueous suspension of 2 cc of 50% dextrose has been used. Depending on the effect of cure, the injections were repeated but not less than 15 days. Patients who have not shown any improvement by 4 injections were deemed as failures.

Dosage of Methylprednisolone: For all cases, sterile aqueous suspension of 1 mL of methylprednisolone containing 40 mg per mL has been used. Depending on the effect of cure, the injections were repeated but not less than 15 days. Patients who have not shown any improvement by 4 injections were deemed as failures.

No special predilection for a method of treatment in a particular case was preferred and so the case selection was random except patient with diabetes, methylprednisolone and 50% dextrose are not used.

Outcome Measurements and Follow-Up

Patient followed up by visual analogue scale for pain intensity at 3 weeks, 6 weeks, 3 months, 6 months and 12 months by Visual Analogue Scale and results are assessed by patient's pain improved or not and recurrence of pain after treatment.

OBSERVATIONS

50 cases of Tennis Elbow have the basis of this study.

Age and Sex Distribution

The youngest patient in this series was a 19 years old boy and the oldest were a male and female aged 62 years. Majority of the patients were seen in the age group of 30 to 39 years (38%). The average age incidence was 30 years.

Age Groups in Years	No. of Patients	(%)	Male	Female
10 yrs19 yrs.	1	2	1	0
20 yrs29 yrs.	13	26	8	5
30 yrs39 yrs.	19	38	6	13
40 yrs49 yrs.	10	20	3	7
50 yrs59 yrs.	6	12	2	4
60 yrs69 yrs.	1	2	0	1
Total	50	100	20 (40%)	30 (60%)
Table 1: Age and Sex Distribution				

Distribution of Treatment

In this study, there are 5 groups of patients taken with five different methods of treatment and patients are chosen randomly and each group distributed evenly. In patients with diabetic mellitus treatment of 50% dextrose and methylprednisolone were not given.

Treatment	No. of Patients	(%)	
Ultrasonic therapy	10	20	
Methylprednisolone	10	20	
50% Dextrose	10	20	
Autologous blood	10	20	
Platelet rich plasma	10	20	
Total 50 100			
Table 2: Different Methods of Treatment			

Distribution of Results

In this series, results of treatment are formulated according to visual analogue scale which consists of 0 to 10 with 0 representing no pain, 10 representing worst possible pain and 5 is moderate pain. Improvement of symptoms assessed by decreasing score in the pain scale during every review of the patients.

Results of Ultrasonic Therapy

In this study, total of 10 patients (20%) treated by ultrasonic therapy. Maximum of 4 sittings given. Out of 10 patients 6 patients (60%) had improved from symptoms and 4 patients (40%) did not get relieved or improved from symptoms even after 4 complete sittings of ultrasonic therapy. In first sitting, 4 patients (40%) were improved from symptoms. In 2nd and 3rd sittings, 1 patient (10%) each were improved from symptoms.

Results of Injection Methylprednisolone

In this study, a total of 10 patients (20%) treated by injection methylprednisolone. Maximum of 4 injections given. Out of 10 patients, 7 patients (70%) had improved from symptoms and 3 patients (30%) did not get relieved or improved of symptoms even after 4 complete methylprednisolone injection.

In first injection, 4 patients (40%) were improved from symptoms. In 2^{nd} , 3^{rd} and 4^{th} injections one patient (10%) each were improved from symptoms.

Results of 50% Dextrose

In this study, a total of 10 patients (20%) treated by 50% dextrose. Maximum of 4 injections given. Out of 10 patients, 8 patients (80%) had improved from symptoms and 2 patients (20%) did not get relieved or improved of symptoms even after

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4 complete injections of 50% dextrose. In first injection, 2 patients (20%) were improved from symptoms.

In 2^{nd} injection 3 patients (30%) were improved from symptoms, 3^{rd} injection 2 patients (20%) were improved from symptoms and 4^{th} injection 1 patient improved from symptoms.

Results of Autologous Blood

In this study, a total of 10 patients (20%) were treated by autologous blood injection. Maximum of 4 injections given. Out of 10 patients, 9 patients (90%) had improved from symptoms and 1 patient (10%) did not get relieved or improved of symptoms even after 4 complete injections of autologous blood. In first injection, 2 patients (20%) were improved from symptoms. In 2nd injection 4 patients (40%) were improved from symptoms and 4th injection 1 patient improved from symptoms.

Results of Platelet Rich Plasma Injection

In this study, a total of 10 patients (20%) treated by injection Platelet Rich Plasma. Maximum of 4 injections were given. Out of 10 patients, 9 patients (90%) had improved from symptoms and 1 patient (10%) did not get relieved or improved of symptoms even after 4 complete injections of Platelet Rich Plasma. In first injection 5 patients (50%) were improved from symptoms. In 2nd injection 3 patients (30%) were improved from symptoms, 3rd injection 1 patient (20%) was improved from symptoms.

DISCUSSION Ultrasonic Therapy

Name of the	Results	Recurrence	
Hohl (1961)	58	[70] 52.21	
Haake M (2002)	54.6	48 34	
A P Dvaz (2002)	64	55.06	
Present study	01	55.00	
(2015)	60	53.84	
Table 3: Incidence of Ultrasonic Therapy			

The effectiveness of ultrasonic therapy in the treatment of tennis elbow is viewed with doubt. There are only a few reports with statistical data published regarding the result of ultrasonic therapy in tennis elbow.

Qualitative study of ultrasonics are compared with this present study.

According to Coste et al in 1951 and Aldes in 1956, 51.4% of patients improved of symptoms and recurrence of 56.92%. According to Hohl (1961), 58% of patients improved of symptoms and recurrence of 52.21%. At present study 60% of the patients relieved of symptoms and recurrence of 53.84%. Results of at present study are comparable with the other studies, which is conducted above.^{7,8} So the treatment of Tennis Elbow with ultrasonic therapy has low effect and high rate of recurrence.

Injection Methylprednisolone

Name of the Author	Results (%)	Recurrence (%)	
Smidt N et al (2004)	68.03	45.18	
Kutay E (2010)	72.28	57.12	
Muhammad Saqib (2013)	65.42	50.71	
Present study (2015)	70	42.86	
Table 4: Incidence of Methylprednisolone Injection Treatment			

The treatment of tennis elbow with local injection of methylprednisolone is the most favoured of all treatments today. It is because easy availability and low cost and well compliance. Most of the reported series show an improvement or cure rate of average 68.57% and recurrence rate of 51%. Present study is comparable with the previous study reports of 70% of improvement and 42.86% of recurrence.⁹

Injection 50% Dextrose

Name of the Author	Results (%)	Recurrence (%)	
Hackett GS (1993)	81.89	29.67	
Schnirring L (2000)	76.56	21.19	
Dagenais S (2006)	83.27	23.14	
David Rabago (2013)	74.93	28.1	
Present Study (2015)	80	25	
Table 5: Incidence of 50% Dextrose Treatment			

Injection 50% dextrose is the most commonly used prolotherapy than other injections used in prolotherapy like sodium muriate because of its easy availability and less complications. Only a relative contraindication of this treatment is diabetes mellitus.^{10,11,12,13} Most of the reported series shows an improvement of average of 79.19% and recurrence rate of average of 24.47%. Present study is comparable with the previous study reports of 80% improvement and 25% of recurrence.

Injection Autologous Blood

Name of the Author	Results (%)	Recurrence (%)	
Edwards SG ¹⁴ (2003)	4.76	8.26	
Lee TG, Ahmad TS (2007)	88.61	13.24	
Kutay E (2010)	87.93	10.48	
Kazemi M (2010)	83.87	16.12	
Wolf JM (2011)	85.31	9.27	
Present Study (2015)	90	11.11	
Table 6: Incidence of Autologous Blood Treatment			

This method of treatment of tennis elbow is effective and can be given in all patients except who has a haematological diseases like haemophilia, etc.

The effectiveness and recurrence of this treatment and which is comparable with the present study. Most of the reported series shows an improvement of average 86.09% and recurrence rate of average 11.47%. Present study is comparable with the previous study reports of 90% improvement and 11.11% of recurrence.^{15,16,17}

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Injection Platelet Rich Plasma

Name of the Author	Results (%)	Recurrence (%)	
Mishra A, Pavelko T (2006)	93	-	
S Sampson, M. Gerhadt (2008)	94.12	4.63	
Andia I, Sanchaz M (2010)	90.97	1.48	
Del Buono A, Papalia R (2011)	91.67	3.23	
Present Study (2015)	90	-	
Table 7: Incidence of Platelet Rich Plasma Treatment			

This treatment in tennis elbow is the most effective and lowest recurrence rate than any of the above treatment discussed, but its limitations are technically demanding.

The effectiveness and recurrence of this treatment and which is comparable with the present study.

Most of the reported series shows an improvement of average 92.44% and recurrence rate of average 3.13%. Present study is comparable with the previous study reports of 90% improvement and nil recurrence.^{18,19,20}

- In conclusion, it can be said that Platelet Rich Plasma seems to be the best method of conservative treatment, because its effectiveness were rapid and high with low recurrence rate.
- Autologous Blood has similar effectiveness as Platelet Rich Plasma, but recurrences were noted.
- 50% Dextrose and Methylprednisolone are of similar effectiveness, but Methylprednisolone were rapid acting and high recurrence than 50% Dextrose.
- But on the whole, the use of ultrasonic has proved to be disappointing due to its low effectiveness and high recurrence rate.

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