

Original Article
Orthopaedics

AN EPIDEMIOLOGIC STUDY OF TENNIS ELBOW PATIENTS ATTENDING THE SEMI URBAN TERTIARY CENTRE

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Abstract:

Aim: This is epidemiologic study of Tennis Elbow patients attending tertiary orthopaedic centre and comparing them with worldwide data.

Methods: All the patients diagnosed with Tennis elbow following standard criteria are included in the study. After detailed clinical and radiological study they are given a standard Questionnaire containing various epidemiological aspects. 50 patients were included in the study. Visual analogue score and Nirschl pain phase study were used to study the end results. The final data were compared with other studies.

Results: Total 50 patients were studied. Female preponderance and right handedness were noted. Majority of the patients were found to be in the 30 – 40 years of age. The shortest duration of symptoms before a patient attended hospital was found to be 10 days and longest was 36 months. In this maximum number of patients who were affected with tennis elbow were house wives (46%). In Nirschl pain phase 9 patients are on phase 3, and in visual analogue scale 16 patients were on phase 5. Routine blood examination was within normal limits in all cases. X-Ray of elbows did not reveal any radiological abnormality.

Conclusion: This study was comparable with other studies, except with some minor variations in Age incidence, side of affection, mode of onset

Key words: Tennis elbow, epidemiology, Nirschl pain phase, Visual analogue scale

Introduction

Pain from lateral aspect of elbow first described in 1873 as a writer's cramp, and at the same time it's been found in so many tennis players and also anybody who does repeated strains on the elbow particularly gripping movement and has since then been given different names such as tennis elbow¹, lateral epicondylitis², lateral epicondylalgia³ and calcarioustendinitis⁴. 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 micro trauma 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 most commonly diagnosed elbow condition⁵. It is well known that very few patients of Tennis Elbow play the game of tennis. Concurrent with the advancement of numerous theories concerning the etiology of tennis elbow, there developed different and often contradictory concepts as regards its treatment. It is imperative to know the pathogenesis of an entity if its treatment is to be rational and successful. Thus as pathogenesis of Tennis Elbow is not understood clearly, its treatment has been empirical and at times is based on postulated pathological changes in the environs of the lateral condyle. Hence an attempt has been made here to study the natural history of the disease. Because of varied presentation and various theories we decided to conduct an epidemiological study of patients with tennis elbow.

Methodology

Approval from the hospital ethical committee was taken. Informed and written consent was taken from the patient. Our study involved 50 with Tennis elbow, treated conservatively in the department of orthopaedics from January 2014 to December 2015. This is a questionnaire based descriptive study.

Before recording the complaints the details of age, sex, occupation and income were noted. Then the chief complaints and the history of present illness were enquired into. In the history of present illness special care was taken to find out the mode of onset, site of pain, duration and history of trauma. Patients were also asked whether they had shoulder or neck pain or any other joint complaints. The dominant handedness was also determined in most of the cases. A detailed history of past treatment was taken and recorded.

On general examination of the patient special attention was paid to note whether the patient had any other joint diseases.

The elbow was then carefully examined to note for swelling, redness, situation of tenderness and the presence of nodules. The exact site of tenderness was located by applying pressure over the epicondylar region. Regional glands were palpated in all cases. Movements of the elbow, superior radio ulnar and shoulder joints and cervical spine were carefully examined in all cases.

After clinical examinations the patients were subjected to routine blood examinations which included red blood cell count, differential white cell count and the erythrocyte sedimentation rate. Antero-posterior and lateral radiographs of elbow and cervical spine also taken. Evaluation

of symptoms are assessed by visual analogue scale. Plain x-ray was used to exclude differential diagnosis such as osteochondritis dessicans, degenerative joint changes or bone tumors. Nirschl phase for pain is used to assess the phase of pain.

Clinical examination

Criteria's for the diagnosis of Tennis Elbow are^{19,20}:

1. Tenderness on palpation of the lateral epicondyle and the Common Extensor Origin.
2. Tenderness in the Common Extensor Origin during resisted extension of the wrist or the third finger.
3. Tenderness on maximum gripping strength.

Tests

Cozen's test:

Ask the patient to make a firm fist while patient maintains the position of extension of elbow, pronation of forearm, radial deviation and extension of wrist. While patient is on this position clinician palpates the lateral epicondyle and applies a flexion force against the patients resistance patient felt pain at the lateral epicondyle .

Mill's test:

While patient keeps her elbow firmly straight and wrist flexed, pronation of the forearm elicits the pain at lateral epicondyle.

Thomson test:

Ask the patient to flex the shoulder at 60 degree, extend the elbow, pronate the forearm and. Then apply a force on the dorsum of 2nd and 3rd metacarpals against resistance the patient will complain pain at the lateral epicondyle region.

Results

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. The female predominance of 60% and most of them were in the age group of 30 – 39 years

Table-1: Age and Sex Distribution

Age groups in years	No. of Patients	Percentage (%)	Male	Female
10yrs-19yrs	1	2	1	0
20yrs-29yrs	13	26	8	5
30yrs-39yrs	19	38	6	13
40yrs-49yrs	10	20	3	7
50yrs-59yrs	6	12	2	4
60yrs-69yrs	1	2	0	1
Total	50	100	20(40%)	30(60%)

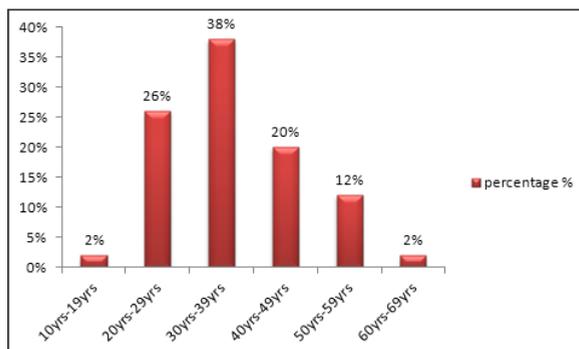


Figure.1: Age Distribution

.Occupation Distribution

In this study 12 different occupations were seen and 5 patients did not have any occupation. The details of number of patients in each occupation is given below. In this maximum no. of patients who were affected with tennis elbow were house wives (46 %).

Table.2: Occupation Distribution

Occupation	No. of Patients	Percentage (%)
Housewife	23	46
Clerk and Typist	8	16
Computer Work	3	6
Coolie	2	4
Student	2	4
Carpenter	1	2
Cook	1	2
Mechanic	1	2
Advocate	1	2
Artist	1	2
Engineer	1	2
Teacher	1	2
No Occupation	5	10
Total	50	100

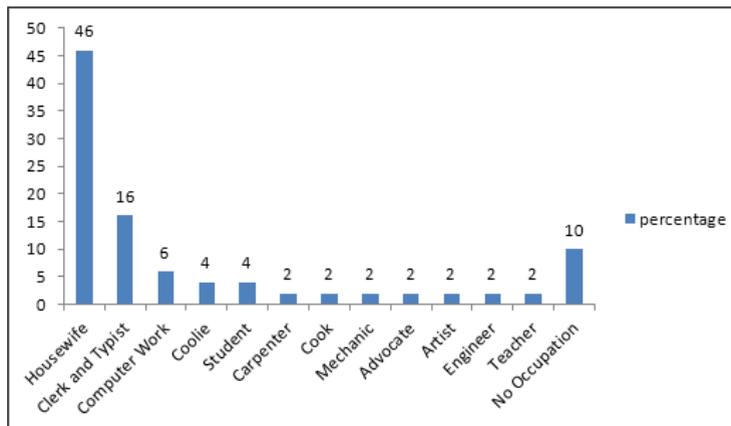


Figure 2: Occupation Distribution

Side Distribution

The right side was found to be affected more than the left side. In this study a total of thirty nine (78%) patients are involvement on right side and eleven (22%) patients are involvement on left side.

Table 3: Side of Distribution

Side	No. of Patients	Percentage(%)
Right	39	78
Left	11	22
Total	50	100

Distribution Of Handedness And Side Of Affection

Out of 50 patients 43 patients (86%) were right handed and 7 patients (14%) were left handed. Among 43 right handed patients 35 patients (81.4%) had right sided lesion. Among 7 left handed patients 3 patients (42.86%) had left sided lesion.

Table 4: Handedness and Side of Affection

Side of affection	Handedness	
	Right	Left
Right Side	35	4
Left Side	8	3
Total	43(86%)	7(14%)

Distribution Of Mode Of Onset

Total of 50 patients, forty two patients (84%) were started pain insidiously and 8 patients (16%) were started pain acutely.

Table.5: Mode of Onset

Mode of Onset	No. of Patients	Percentage (%)
Insidious	42	84
Sudden	8	16
Total	50	100

Distribution Of Duration Of Symptoms

The shortest duration of symptoms was found to be of 10 days and the longest of 3 years. The majority of patients had symptoms of 3-6 months.

Table.6: Duration of Symptoms before the Present Treatment

Duration of Symptoms	No. of Patients	Percentage (%)
<1 Month	6	12
1 to 2 Months	6	12
2 to 3 Months	8	16
3 to 6 Months	14	28
6 to 12 Months	8	16
12 to 18 Months	5	10
18 to 24 Months	1	2
>24 Months	2	4
Total	50	100

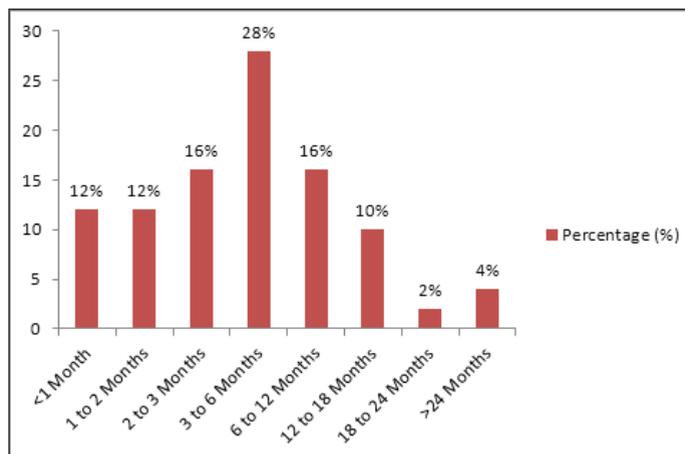


Figure.3: Duration of Symptoms before the Present Treatment

Distribution Of Elbow Joint Function

In this study Sixteen patients (32%) had Limitation of elbow joint movement due to pain.

Table 7: Elbow Joint Function

Joint examination	Elbow	Percentage(%)
No. of Patients with full movements	34	68
No. of Patients with Limitations of Movements	16	32
Total	50	100

Distribution Of Nirschl Phase For Pain

Nirschl phase for pain is used to assess the phase of pain at which patient present. In this, maximum number of patients presented in phase-3.

Table 8: Distribution of Nirschl Phase for Pain

Phase	No. of Patients
0	0
1	7
2	6
3	9
4	6
5	7
6	8
7	7

Discussion:

Age incidence

Table 9: Age Incidence

Name of the Author	Minimum Age	Maximum Age	Average Age
Gruhow HW,(1979)	21	66	38.4
Shiri, (2006)	30	62	36
Andrew G Titchner, (2012)	25	64	35
Present study (2014)	19	62	37

Tennis Elbow most commonly occurs between age group of 30 – 40 years.⁹ It is very rarely below this age. Ian Goldie⁹, who thinks that granulation tissue in the subtendinous space is responsible for Tennis Elbow, is of opinion that this disease cannot occur in individuals before 17 years of age as this space is nonexistent before that age. Most reports show its incidence above 60 years of age to be less common. The average age incidence most of the authors is between 30 – 40 years.^{6,10-11}

In the present series the largest number of cases (38%) occurred in the age group between 30 to 39. Next is 20 to 29 age group is being next thus 26% as compared to other study 2nd most common age group is 40 – 50 years but due to evolving computer work, type writing work and engineering works people are affected little younger than the previous generation.

Sex Incidence

Table 10: Sex Incidence

Name of the Author	Male (%)	Female (%)
Gruhow HW (1979)	58.97	41.03
Shiri (2006)	60	40
Andrew G Titchner(2012)	58.06	41.94
Present study (2014)	60	40

Tennis elbow is a disease thought to be more in males . But in the literature, there are quite number of reports showing female predominance. A few are of the opinion that the incidence is more or less equally common in both sexes.^{6,10,11}

In the present study it was found that 30 (60%) females affected in total 50 patients. This findings are coincides with the other study.

Occupation Incidence

In the present series, it was found that 23 (46%) patients out of 50 patients are housewives. The increase in number of housewives was due to the fact that most of the patients who have their disease are housewives who do their daily needs by themselves. The next most common occupation was found is clerk, typist and computer work of 11 patients (22 %).

Bernhardt in 1986 described Tennis Elbow as an occupational neuralgia. He reported 28 of his 30 patients to have over exerted their arm at work. But now it is generally agreed that those who are employed in occupations which involve repeated performance of dorsiflexion of the wrist and pronosupination of forearm such as gardeners, printers, typists, housewife's, players of various games like tennis, cricket etc. often develop this disease.¹²

Incidence of Side of Affection

Table 11: Incidence of side of Affection

Name of the Author	Right (%)	Left (%)	Bilateral (%)
Quin & Binks (1954)	74.2	25.8	-
Verharr (1991)	66.3	33.68	-
Palmer KT (2001)	76.92	21.54	1.45
Shiri (2006)	68.1	31.9	-
Present Study (2014)	78	22	-

All the series so far reported a predominance of right sided affection. Bilateral affections are occasionally seen.^{13,-15,6} In present series right sided affection is more common 39 patients (78%). No bilateral affection is seen. In all this study shows right sided affection is more common than the left sided affection this is probably due to right handed person is more common than the left handed.

Incidence Of Handedness And Its Relation To The Side Of Affection

Table: 12 Incidence of Handedness

Name of the Author	Quin & Binks (1954)	Hohl (1961)	Shiri (2006)	Present Study (2014)
Percentage of Right sided lesion in the Right Handed Person	76.66	65.62	75.20	80.4
Percentage of Left Sided lesion in the Left Handed Person	100	34.38	40.5	42.8

The relationship between the handedness and the side of affection has been bestowed more importance in recent years, on determining the handedness in their cases found that more than more than 65% of the affection to be on the dominant side.^{6,15,16} Their values are compared with the present series.

Mode of Onset

Table 13: Incidence of Mode of Onset

Name of the Author	Sudden (%)	Insidious (%)
Hohl (1961)	22.73	77.27
Gruhow HW (1979)	15.69	84.31
Shiri (2006)	26.01	73.99
Present study (2014)	16	84

Insidious nature of onset of tennis elbow is well known. If the onset is sudden, it is usually due to the direct trauma or secondary to severe indirect strain like vigorous tennis playing etc.^{6,16,10} Their values are compared with present study.

Incidence of Duration of Symptoms

Table 14: Incidence of Duration of symptoms

Name of the Author	Minimum Duration	Maximum Duration
Albovy et al(1961)	2 weeks	11 months
Shiri (2006)	15 days	3.5 years
Present study (2014)	10 days	3 years

The duration of symptoms before a patient presents himself to the hospital varies from few days to several months. It depends upon several factors like severity of symptoms, availability of time from routine work, education, health outlook of the patient etc. in general it is seen that not many patients attend to the hospital at first due to symptoms in pain is mild in most of the cases.^{6,17} In this series minimum of 10 days and maximum of 3 years see which is comparable with other studies.

Incidence of Tenderness

Various points at the lateral side of the elbow were noted by various

authors to be the sites of maximum tenderness. but the general opinion is in favour of a point just below and in front of the lateral epicondyle.^{13,6,9} In this present study also maximum tenderness present at the lateral and in front of the lateral epicondyle.

Incidence of Elbow Movements Affection

Full painless movements of the elbow, as well as the superior radio humeral joints are expected in most of the cases. But occasionally limitation of extension and weakness grip may be noted.^{18,9,16} In the present series movement of elbow and superior radio ulnar joints were full and painless in 34

patients (68%). And 16 patients (32%) had restriction of elbow movements. This study was comparable with other studies.

Incidence Of Investigations

Ian Goldie in 1964 conducted a detailed laboratory and radiological investigation but only one patient had a calcified lesion on radiography and no laboratory abnormalities were revealed out of 41 cases.⁹ As per the discussion at present study also didn't reveal any relevant abnormalities in both lab and radiological investigations.

Conclusion

- A total 50 patients with 50

elbows were studied. Majority of the patients were found to be in the 30 – 40 years of age. There was female predominance (60%) in this series which was thought to be due to the absence of industrial workers. The right sided lesion (78%) was found to be more common than left sided lesion (22%).

- Handedness was determined and was found that right handedness (86%) was more common than the left. In that 81.4% of right handed person had a lesion on right side and 42.86% left handed persons had left sided affection. The insidious onset 84% was found to be more common than the sudden onset 16%.
- The shortest duration of symptoms before a patient attended hospital was found to be 10 days and longest was 36 months. On examination of the movements of elbow only 32% patients had limitation of movement.
- In Nirschl pain phase study, 9 patients are on phase 3, and in visual analogue scale. 16 patients are on phase 5.
- Routine blood examination was within normal limits in all cases. X-Ray of elbows did not reveal any radiological abnormality.

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