

Exploring the Prevalence and Association of Tennis Elbow with duration and type of Art Activity among University students of Fine arts Department in Sargodha, Pakistan.

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ABSTRACT

Objective: To determine the prevalence of tennis elbow in fine arts students and to check its association with duration and type of art activity.

Methodology: In this descriptive cross-sectional study, 354 participants were selected from fine arts department of various universities of Sargodha, Pakistan, through non-probability convenient sampling technique from May to August 2022. A self-designed questionnaire, PRTEE scale, and cozen test was used to estimate the prevalence and association of risk factors for tennis elbow. Data was analyzed by using SPSS version 21.

Results: Findings revealed that prevalence of tennis elbow among fine art students was 48.59%. About 62.43% students were doing painting and almost 50% perform art activity more than 5 hours daily. Total PRTEE score's mean value was found to be 30.97 ± 21.609 . Cozen test was positive in 48.87% individuals. Significant association of tennis elbow was found with type and duration of art activity having p-values 0.033 and 0.040 respectively.

Conclusion: Tennis elbow is a common musculoskeletal condition among fine art students. Duration and type of art activity significantly affects the occurrence of tennis elbow. Painting was reported as a major type of art activity associated with prevalence of tennis elbow. Moreover, engaging in artwork for more than 5 hours daily also increase the risk of developing tennis elbow. The policy makers in fine arts faculties who are responsible for students' health should prioritize strategies to prevent and manage this condition.

Index Terms- Tennis elbow, pain, Extensor carpi radialis brevis, humerus, Cozen test.

I- INTRODUCTION

Tennis elbow, also known as Epicondylalgia lateralis humeri, is thought to be caused by excessive strain in the lateral epicondyle of the humerus at the wrist extensors origin. This condition usually presents with pain, tenderness on outside of elbow, soreness of forearm muscles, and weakness when grasping. Long term symptoms are related with inadequate muscle power and endurance. ⁽¹⁾ The lateral elbow pain, lateral epicondylitis, rowing elbow, tendonitis of the common extensor origin, and peri tendonitis of the elbow are all used to describe tennis elbow. ⁽²⁾ This disease was first characterized as "writer's cramp" in 1873. The hallmark of this condition is Angio fibroblastic dysplasia of the long extensor tendons of forearm. ⁽³⁾

Tennis players used to experience it frequently, but it can now occur in any sport or job that repeatedly involves wrist extension, radial deviation, or forearm supination. Patients complaining with elbow pain in general are more likely to be diagnosed with tennis elbow. Men and women are equally affected equally. Risk factors for this condition are smoking, obesity, and repetitive activity for more than 2 hours daily. ⁽⁴⁾

It has been discovered that pathology is a degenerative tendinosis, which differs from tendinitis in that it has dense populations of fibroblasts, vascular hyperplasia, and unorganized collagen. On radiographs, the lateral epicondyle may appear to have some mild calcification. ⁽⁵⁾ The typical diagnosis of lateral epicondylitis is tenderness over the extensor origin just anterior and distal to the lateral humeral epicondyle. The beginning of pain is usually slow and may be related to recent adjustments in one's profession or athletic pursuits. Patient frequently describe discomfort related to shaving, moving luggage or groceries with

extended elbows, lifting coffee cups, or shaking their hand.⁽⁶⁾

Conservative treatment regimen is focused on minimizing the overload forces that caused the actual injury by using a counterforce brace, altering the technique and equipment, reducing inflammation and pain with rest, ice, anti-inflammatory drugs, and cortisone injections, promoting the healing process with high voltage galvanic stimulation, arm and forearm strength, endurance, and flexibility exercises. Surgery may be necessary as a final option in chronic complaints. Numerous treatments, including acupuncture, exercise therapy, manipulations and mobilizations, ultrasound, phonophoresis and iontophoresis, showed promise in reducing discomfort and pain or enhancing function for people with lateral epicondylitis.⁽⁷⁾

The most frequently identified elbow ailment is lateral epicondylitis, which affects 1% to 3% of the general population annually. Workplace activities are to blame for 35% to 64% of all cases.⁽⁸⁾ In a previous study it was stated that not only do people who are athletes get tennis elbow but also affects many persons who engage in repetitious and demanding tasks at work or during leisure using the arms forearm muscle. Carpenters, painters, and plumbers are additionally prone to tennis elbow. Research has indicated that cooks, butchers, and even autoworkers also frequently experience tennis elbow. It is believed that repetition and weightlifting necessary for these jobs results in injury.⁽⁹⁾ Another study was conducted on neuro mechanical aspects of playing-related mobility disorders in orchestra violinists and upper strings players described that, common types of repetitive strain injuries of the upper extremities includes, tennis elbow, can result from overusing the arm, forearm, and hand muscles, which can cause elbow pain, especially when the arm is frequently bent and extended.⁽¹⁰⁾

It has been demonstrated in a previous study that, tennis elbow is more common in athletes who engage in repetitive motions, such as golfers and tennis players. Additionally, amateur tennis players who have not yet mastered the correct technique are more likely to experience the annoyances associated with lateral epicondylitis. The condition is also typical of occupational illnesses in a variety of occupations, including those of violinists, car mechanics, accountants, IT professionals, surgeons, and even online educators.⁽¹¹⁾ Previous study showed that a history of repetitive activity or overuse, like playing tennis intensely at a training camp or painting a house, is frequently seen among patients of lateral epicondylitis. Simple tasks like raising a plate or coffee cup, opening a car door, wringing out a wet dishcloth, or shaking hands might be made more difficult by wrist weakness.⁽¹²⁾ Much research has been conducted on prevalence of tennis elbow among musicians, carpenters, and computer operators but there is limited literature regarding its prevalence among fine art students. Thus, focus of our study was to explore the prevalence of tennis elbow and to check its association

with duration and type of art activity among fine arts students at various universities in Sargodha, Pakistan.

II- MATERIAL & METHODS

Cross-sectional observational study design was used to determine the prevalence of tennis elbow among fine arts students in various universities of Sargodha, Pakistan. Study was conducted from May to August 2022. Non-probability convenient sampling technique was used to recruit the individuals for study. Data was taken from 354 participants from fine arts students at various Universities of Sargodha by using 64% prevalence of tennis elbow from previous study⁽¹³⁾ through formula: $n = Z^2 P (1-P)/d^2$ ⁽¹⁴⁾ for sample size calculation. Fine arts students at University of Sargodha, including both male and females with age between 18-25 years and performing art activity for at least 3hours daily (13) were included. Students with any traumatic injury, neurologic deficiency, any congenital disease or with condition of cubitus varus and valgus were excluded.⁽¹³⁾ Informed consent was taken in both English and Urdu. Self-generated questionnaire and cozen test⁽¹⁵⁾ were used to check the prevalence of tennis elbow among fine arts students. PRTEE scale was to assess the level of pain and functional disability of participant⁽¹⁶⁾ SPSS 24.0 was used for data analysis. Descriptive analysis of data was computed by using pie charts, bar graphs and frequency tables. Pearson Chi-square test was used to analyze the association of tennis elbow with duration and type of art activity.

III- RESULTS

In this cross-sectional observational study 354 students were assessed for lateral epicondylitis. Mean age of participants was 20.6130 ± 1.13155 years. There were 126 (35%) males and 228 (64%) female students. Results showed that 48.59% students were suffering from pain and tenderness in lateral aspect of forearm. PRTEE scale was used to assess pain and functional performance in fine arts students. Mean values of PRTEE pain score, PRTEE functional disability score and Total score were 17.12 ± 11.376 , 14.07 ± 12.124 and 30.97 ± 21.609 respectively. Cozen test was found to be positive in 48.87% individuals with no effect on grip strength in 62.99% cases. (Table 1)

Table 1: Descriptive statistics of age, gender, PRTEE scores, cozen test and grip strength.

Age	N=354 mean±S.D (20.613±1.121)
Gender	males=126(35%), females=228(64)

PRTEE-Scores (mean±S.D)	Pain score 17.115±11.376 Functional score 14.073±12.123 Total score 30.974±21.608
Cozen Test	Positive-48.6%, Negative-50.8%
Grip Strength	Affected-36.8%, Not affected-62.6%

Majority of students were painting (62.43%), while 34.46% graphics, 1.41% textile and 1.69% sculpture students were also observed. Almost 50% of students were performing art activity for more than 5 hours daily. 53.11% students experienced pain while performing art activity work. Right side was affected in 29.10% of individuals with insignificant previous medical history among 74.58% cases. 38.42% students experienced no symptoms while performing art activity, while 33.33% have pain, 17.23% have tenderness and 11.02% have limited movements as their dominant symptom. Among 32.49% students' pain was radiating from elbow to forearm. Pain pattern was intermittent in 36.44% students causing limitation of daily activities in 29.66% cases. About 36.72% students get relieve from pain by changing position, 26.84% by quitting the activity, 12.71% by taking medicine and 23.73% reported no pain relief. (Table 2)

Table 2: Descriptive statistics of affected arm, dominant symptom, duration of art activity, type of art activity, relieving factors and previous medical history.

Affected arm	Right-29.1% Left- 20.1% Both-9.3% None-41.3%
Dominant symptom	Pain-23.4% Tenderness-37.1% Limited movement-16.3% None-23.2%
Duration of art activity	3 hours-20.3% 5 hour-30.5% More than 5 hours-49.5%
Type of art activity	Painting-30.5% Graphics-16.6% Textile-29.5% Sculpture-23.4%

Relieving factors	Quitting activity-39.5% Changing position-7.1% Medicine-29.7% None-23.7%
Previous Medical History	Trauma-11.0% Systemic illness-14.3% Insignificant-74.58%

Significant association of tennis elbow was found with duration and type of art activity having p-values 0.033 and 0.040 respectively. (Table 3)

Table 3: Association of tennis elbow with duration and type of art activity.

Study Variable	N of valid cases=354
Association b/w tennis elbow & duration of art activity	Pearson chi-square Value=6.431 df=2 Sig=0.040
Association b/w tennis elbow & type of art activity	Pearson chi-square Value=221.620 df=3 Sig=0.000

IV- DISCUSSION

Tennis elbow is a result of repetitive motions that strain the muscles, like grasping and wrist extension. Although it mostly affects tennis players, it can happen in any sport or line of employment when there is excessive wrist extension, radial deviation, or forearm supination.⁽⁴⁾

In a previous study data was taken from 179 participants including students, faculty members and research assistants of fine arts department and it showed 64% prevalence of performance related musculoskeletal pain among studied population, 96% expressed musculoskeletal discomfort in at least one location and 42% reported musculoskeletal pain in at least two locations.⁽¹³⁾ This correlates with present study results indicating 48.59% prevalence of tennis elbow among fine arts students. Another study conducted on tennis elbow-Lateral elbow pain syndrome, reported that condition was more prevalent in middle- aged females than males. Present study also indicated presence of tennis elbow in about 64% females students.⁽¹⁷⁾ Although it can also happen as a severe

injury or trauma to the lateral elbow, it is typically thought of as an overuse syndrome that involve repetitive wrist extension against resistance. It was found previously that tennis elbow mostly occurs in dominant arm and is thought to impact 1.3 percent of the population annually. This is congruent with the current study results in which dominant arm (right side) was found to be more commonly involved among students working in fine arts department.⁽²⁾

According to a previous study, the most prevalent physical symptom of tennis elbow is pain on palpation over the lateral epicondyle and production of pain and weakness while assessing strength of grip. The common extensors attachment point of lateral epicondyle is the source of lateral epicondylitis pain, which may spread into the forearm and dorsum of the wrist. This correlates with current study results which indicated radiation of pain from the elbow to forearm and wrist, and reduced grip strength among students with severe condition of tennis elbow.⁽¹⁸⁾ Another study that was conducted on the management of tennis elbow described clinical signs of pain with resisted movement, normal elbow range of motion, and tenderness at the lateral epicondyle. In our study, lateral epicondyle tenderness and pain that radiate to dorsum of the forearm, were reported as dominant symptoms. These symptoms were experienced during resisted movements or repetitive activities involving wrist and elbow while at rest there was no pain. Results of both studies shows correspondence to each other.⁽¹⁹⁾

Typically, a clinical history and tests developed by Maudsley and Cozen are considered highly sensitive for lateral epicondylitis diagnosis. In present study, cozen test was used for the confirmation of tennis elbow with the objective of reproducing pain experienced by the patient. Test results were positive among 48.87% participants confirming the presence of tennis elbow.⁽¹⁹⁾ A study conducted on pain, functional disability, and psychologic status in tennis elbow showed significantly higher PRTEE score for pain and functional subscales and total score for disability. This correlates with current study in which using PRTEE scale measures for participant's assessment showed considerable functional disability and pain among fine art students.⁽²⁰⁾

In past, it has been described that tennis elbow frequently affects working age and results in absenteeism from work, which has a significant economic impact. Strenuous manual tasks for wrist and elbow involving force and posture are among the work-related characteristics that cause tennis elbow. In current study, painting proved to be a major strenuous manual activity acting as a contributing factor when compared to graphics, sculpture and textile designing.⁽²¹⁾ Students with tennis elbow usually experience pain while performing art activity due to repeated use of paint brush or other hand tools. Pain is typically affecting the lateral elbow and gets worse with activity and becoming better with rest. This correlates with a previous study

describing that tennis elbow is primarily brought on by repetitive wrist extension or repeated gripping motions that need recurrent wrist extension, radial deviation, and forearm supination⁽²²⁾

A study was conducted on the incidence, recurrence, and effectiveness of preventative measures in tennis elbow. It demonstrated that more playing time was linked to a rise in the frequency of new instances. Investigations found that tennis players over age of 40 who played more than two hours per day had nearly twice the chance of getting tennis elbow than those who played less than two hours, but in the younger age range, those who played two or more hours had over 3.5 times greater risk of those who played less than 2 hours. This is congruent with present study results, in which students who performed their art activity for more than 5 hours daily developed the symptoms of pain and tenderness at elbow more often as compared to those who perform their art activity for less time. Moreover, results showed significant association between duration of art activity and tennis elbow. This indicates that duration of activity greatly influences the occurrence of Tennis elbow.⁽²³⁾

V- CONCLUSION

This study concluded that Tennis elbow is a common musculoskeletal condition among fine art students. Duration and type of art activity significantly affects the occurrence of tennis elbow. Painting was reported as a major type of art activity associated with prevalence of tennis elbow. Moreover, engaging in artwork for long durations also increase the risk of pain and functional disability. The policy makers in fine arts faculties who are responsible for students' health should prioritize strategies to prevent and manage pain/this condition.

Conflict of Interest

All authors have declared no conflict of interest.

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Data availability

Data will be provided on the demand by corresponding author.

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