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PREVALENCE OF LATERAL EPICONDYLITIS IN STREET SWEEPERS

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ABSTRACT

Lateral epicondylitis (LE), commonly referred to as tennis elbow, is a prevalent musculoskeletal disorder resulting from repetitive overuse of the extensor muscles of the forearm, particularly the extensor carpi radialis brevis. While often associated with sports, occupational exposure to repetitive movements also significantly contributes to its development. This cross-sectional observational study aimed to determine the prevalence of lateral epicondylitis among street sweepers, an underrepresented and high-risk occupational group. The study was conducted in the PCMC area of Pune over a six-month period and included 96 participants aged 21 to 60 years with more than 3 years of work experience. Diagnosis was confirmed using Cozen's Test and pain was assessed through the Numerical Pain Rating Scale (NPRS). Results indicated that 54% of participants tested positive for LE, with the highest prevalence observed in the 41–50 age group and among individuals with 11– 15 years of work experience. Female workers and those with right-hand dominance reported higher cases. These findings highlight a pressing need for preventive strategies, ergonomic interventions, and awareness programs to improve occupational health and reduce the risk of chronic upper limb disorders in street sweepers.

KEYWORDS: Lateral epicondylitis, Occupational health, Street sweepers, Extensor Carpi radialis Brevis, Cozen's test, NPRS.

I. INTRODUCTION

Lateral epicondylitis was first described in the medical literature by Runge in 1873.[1] Rather than an inflammatory condition, it is tendinosis (i.e., chronic symptomatic degeneration of the tendon) that affects the common attachment of the tendons of the extensor muscles of the forearm (extensor carpi radialis brevis, extensor digitorum, extensor digiti minimi, and extensor carpi ulnaris) to the lateral epicondyle of the humerus.[2]

Lateral epicondylitis also known as "tennis elbow" is an overuse syndrome of the common extensor tendon, predominantly affecting the extensor carpi radialis brevis.[3] Lateral epicondylitis typically occurs in the 4th and 5th decades, with equal prevalence in women and men.[3]

Patients complain of poorly defined pain located over the lateral elbow that is typically exacerbated by activities requiring wrist extension and/or wrist supination against resistance. There will often be pain in the morning as well as after any period that the elbow has been held in a flexed position.[3] At physical examination, signs of lateral epicondylitis include pain at palpation over the origin of the common extensor tendon and reduced strength with resisted grip, supination, and extension of the wrist.[3]

Sweeping as a work job and employment, is specially thought of and considered to be an unskilled one (Johncy 2014).[4] Street Sweepers are the vulnerable segment of our community and suffer from different occupational health problems due to limited education, and lack of knowledge on occupational health hazards.[4] Musculoskeletal pain is a major worldwide occupational health problem and can affect many different parts of the body including the upper and lower back, neck, shoulders, and extremities (arms, legs, feet, and hands).

Street Sweepers have been dedicating their lives to cleaning our community but the community has isolated them in terms of socio-economical and mental aspects from the mainstream community.[5] The most important risk factor is the repetitive and awkward posture that resulted in the development of Musculoskeletal Disorders.[6]

Hard perceived physical exertion combined with elbow flexion-extension (>2hrs /day) and bending more than >2hrs/day was a strong significant risk factor for elbow pain and epicondylitis.[7] A systematic review of literature conducted on the association between type of work, physical load and psychological aspects of work and the occurrence of specific elbow disorders concluded that handling tools >1 Kgs handling loads >20kgs at least 10 times per day and repetitive movement >2hrs per day were associated with lateral epicondylitis.[8]

The application of stress to a tendon normally leads to increased cross-linkage and collagen deposition. When the rate of stretching exceeds the tolerance of the tendon micro-tear results, and the adaptation of the tendon to multiple micro-tears leads to tendinosis.[9] It occurs often in repetitive upper extremity activities such as computer use, heavy lifting, forceful forearm pronation and supination, and repetitive vibration.

Diagnosis carried out for Lateral Epicondylitis is Cozen’s Test.

II. METHODOLOGY

An observational study was carried out on 96 street sweepers who uses broom stick, with age group of 21-60 years having more than 3 years of experience and 8-10 hours of working daily. The study was conducted in and around pcmc area pune using convenient sampling method as per the inclusion and exclusion criteria. The subjects were informed about the study, so to find the prevalence of lateral epicondylitis the cozen test was performed and to rate the pain intensity the NPRS scale was used. Data was collected, analyzed and results were obtained.

II.A Inclusion Criteria

- Age 21-60 years
- Men and women

- >3 years of experience
- Sweepers willing to participate

II.B Exclusion Criteria

- Trauma to upper limb
- Radial tunnel syndrome
- Recent h/o surgery (neck and upper limb)
- Peripheral nerve injury
- Recent history of fracture of Humerus, Radius, and Ulna.

II.C Outcome Measure

1. Cozens Test

- In the cozen test the patient's elbow is stabilized by the therapist's thumb and then the patient is asked to actively make a fist, pronate the forearm, radially deviate, and extend the wrist while the therapist will resist the motion.[10]
- The positive test indicates sudden pain at the lateral epicondyle of the humerus.
- Sensitivity: 83%.[11]
- Specificity: 90%.[11]

Fig. 1: Cozens test performed on street sweepers.

Fig. 2: Ergonomic position of street sweepers.

2. NPRS

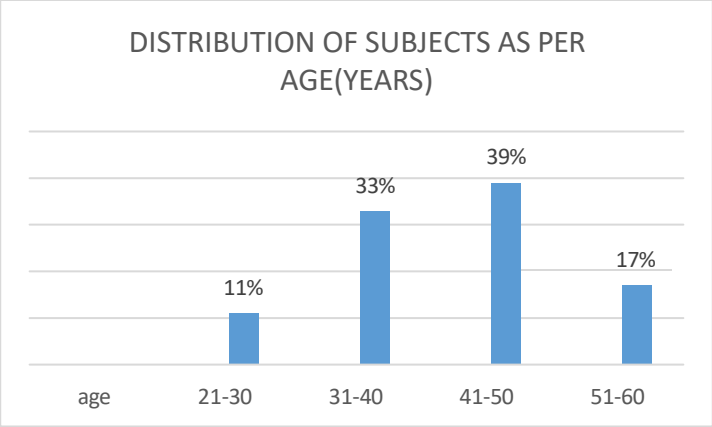
- Reliability -0.95

III. STATISTICAL ANALYSIS

The data was Collected and analyzed by using MS Excel and descriptive statistics.

IV. RESULTS

Age	Frequency of sweepers	Percentage
21-30	11	11%
31-40	32	33%
41-50	37	39%
51-60	16	17%
Grand Total	96	100

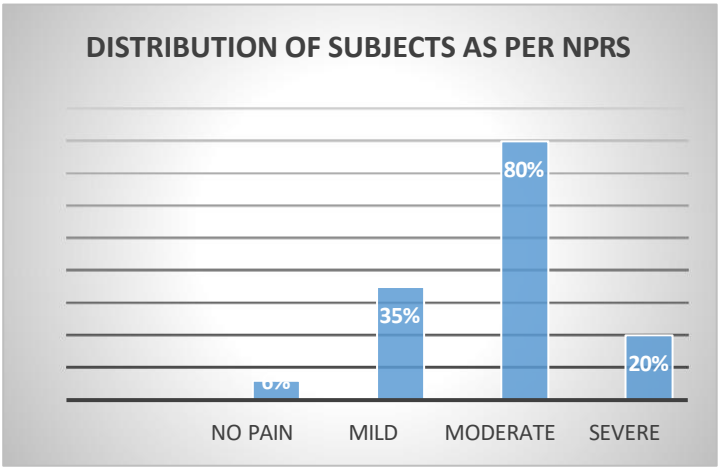


Graph no 1: Distribution of subjects as per age for the study.

INTERPRETATION

Graph 1 shows that 11% (11) subjects are between the age of 21-30 years, 33% (32) subjects are between the age of 31-40 years, 39% (37) subjects are between the age of 41-50 years and 17% (16) subjects are between the age of 51-60 years. The age group most affected is between 41-50 years and the least affected is between 21-30 years.

NPRS	No. of Subjects	Percentage
No Pain	6	6%
Mild Pain	31	35%
Moderate Pain	47	80%
Severe Pain	12	20%
Grand Total	96	100

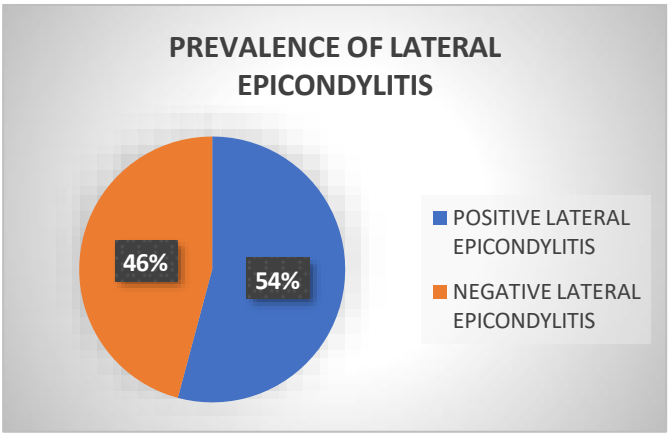


Graph no 2 - Distribution of subjects as per NPRS.

INTERPRETATION

Graph 2 shows that 35% (31) subjects were having mild pain, 80% (47) subjects were having moderate pain, 6% (6) subjects were having no pain and 20% (12) subjects were having severe pain. the study showed that there is a prevalence of mild to moderate pain in street sweepers.

Lateral Epicondylitis	No. of Street Sweepers	Percentage
Positive	52	54%
Negative	44	46%
Grand Total	96	100



Graph 3 - Prevalence of lateral epicondylitis in street sweepers.

INTERPRETATION

In Graph 3 it is seen that out of 96, 54 % were positive for lateral epicondylitis and 46 % were negative for lateral epicondylitis. Among 96 subjects the prevalence for lateral epicondylitis was 54%.

V. DISCUSSION

A study was conducted to investigate the prevalence of lateral epicondylitis among street sweepers. The Cozens test was utilized, and pain intensity was assessed using the Numeric Pain Rating Scale (NPRS) as an outcome measure.

Lateral epicondylitis, commonly known as Tennis elbow, is a condition resulting from the excessive strain on the common extensor tendon due to both eccentric and concentric overload, leading to tendinosis and inflammation of the Extensor Carpi Radialis Brevis (ECRB).[12]

The repetitive use of forearm and elbow muscles and tendons, coupled with continuous contraction during manual tasks, can impose excessive stress on the elbow tendons.[12] Pain is typically felt in the front and distal region of the lateral epicondyle.[12]

Musculoskeletal problems can be a concern for street sweepers due to the repetitive nature of their work. The constant sweeping motions and physical exertion can put a strain on their muscles and joints, leading to issues like back pain, shoulder pain, and repetitive strain injuries.

In the study, to avoid discrepancy I have included sweepers who are working for the same duration in the PCMC area.

Individuals aged 41-50 years are most commonly affected by this condition, representing 39% of cases. The higher prevalence in this age group is linked to the degenerative nature of the condition, characterized by increased fibroblasts, vascular hyperplasia, proteoglycans, and immature collagen, leading to granulation tissue formation in the tendon and lateral elbow pain.[13] In contrast, the 21-30-year age group has a lower incidence rate of 11%, likely due to limited work experience and reduced exposure to associated risk factors.

Kanjanar Pintakham and Wattasit Siriwong conducted research titled “Prevalence and risk factors associated with musculoskeletal discomfort among street sweepers” in 2016. The findings of this study indicate that musculoskeletal discomfort presents a complex issue that not only affects the health status of street sweepers but also leads to increased

absenteeism from work. Street sweeping work involves repetitive movements and awkward postures leading to musculoskeletal discomfort and shows the average age of subjects 46 years with a standard deviation.[14]

The findings indicate that a majority of subjects, approximately 80%, experience moderate pain. This discomfort primarily arises when the Extensor Carpi Radialis Brevis (ECRB) muscle is overused, leading to microscopic tears at its attachment point on the lateral epicondyle, causing inflammation and pain. The simultaneous application of load and force stresses the muscles, reducing blood flow to the affected muscle groups. This reduction in blood flow results in muscle fatigue and soreness.

In 2013, a study was conducted by Eleonare Herquelot, J. Roquelaure, Y. Ha, A. Leclerc, and M. Goldberg to investigate the work-related risk factors associated with lateral epicondylitis and other sources of elbow pain within the working population. The research findings indicated a significant correlation between the combined physical exertion and elbow movements with lateral epicondylitis. Discrepancies in the association observed between lateral epicondylitis and elbow pain alone underscore the necessity for longitudinal studies and identification of established risk factors. The study, involving a sample of workers, revealed that 10.5% experienced elbow pain without lateral epicondylitis, while 2.4% were diagnosed with lateral epicondylitis.[15]

The study findings revealed that among street sweepers, the highest prevalence of lateral epicondylitis was observed in individuals with 6-15 years of experience. With increasing years of experience in this occupation, repetitive movements over time can lead to cumulative stress on the tendons and muscles around the elbow. As sweepers gain more experience, they might take on more demanding tasks or work longer hours, which can further contribute to the strain on their elbows.

The street workers' movements of hand When they do Sweeping, street sweepers, mainly use flexion and extension movements to move the broom back and forth. This repetitive motion can put a strain on the tendons and muscles around the elbow joint. At the wrist, street sweepers often engage in repetitive radial deviation and ulnar deviation movements to control the angle of the broom. These movements help them effectively sweep the streets. The Extensor carpi radialis brevis is at increased risk for damage because of its static position.

A study conducted by Z Joyce Fan, Sarbara, and Bao S “Quantitative exposure-response relation between physical workload and prevalence of Lateral Epicondylitis in a working population” in 2009 found that the frequency of forceful exertion or a combination of forearm supination and forceful lifting was significant physical factors and should be considered for prevention strategies.[16]

The Cozen test, which was performed on 96 subjects, showed positive results in 54% of cases, and 44 subjects were negative, indicating pain over the lateral epicondyle due to inflammation caused by repetitive hand movements. Therefore, the prevalence of lateral epicondylitis in street sweepers is estimated to be 54%.

VI. CONCLUSION

The results of the study showed that 54% prevalence of Lateral Epicondylitis is found in street sweepers.

VII. CLINICAL IMPLICATION AND FUTURE SCOPE OF STUDY

- Early detection, Intervention, and newer techniques can be studied in preventing lateral epicondylitis in street sweepers.
- Hand function, grip strength, and risk factors associated with lateral epicondylitis in street sweepers can be studied.
- On a large sample size the study can be done in specific age groups to understand how different age groups of street sweepers are affected by lateral epicondylitis and specific area covered by street sweepers.
- A study can be done by considering the total area covered by the sweepers can provide insights into the factors that contribute to the condition.

VIII. LIMITATIONS

The limitation of the present study was I have included a wide age group, which might influence my results.

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