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Original Article

Prevalence of Medial Elbow Pain in Taxi Drivers of Lahore; A Cross-Sectional Study

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ABSTRACT

Background: Pain in the medial side of elbow in taxi drivers is a work-related problem that normally comprises repetitive movement and occurs commonly in wrist flexion with pronation of the forearm. **Objective:** To determine the prevalence of medial elbow pain in taxi drivers in Lahore. **Methods:** This cross-sectional study comprised of 268 taxi drivers from Lahore. Questionnaires were given to taxi drivers who were recruited through convenient sampling. Consent forms, both in Urdu and English were explained before data collection. Professional participants who had taxi driving as an occupation and who were working for two years were involved in this study. To fulfill the criteria of a sample size that was 268 the record of taxi drivers was also gathered from the e-record of Uber and Careem, Lahore. Taxi drivers of age 20 to 55 years, both gender and those who had working hours of 5 to 8 or more hours were included in this study. Drivers who had any recent traumatic injury or had been in a recent road traffic accident, undergone surgery were excluded from this study. The visual analogue scale was used as an outcome measuring tool to assess the medial elbow pain in taxi drivers. The taxi drivers were asked to fill out questionnaires, which consisted of questions focusing on pain, daily activities, difficulties in function and personal care. Data was analyzed by SPSS version 23, qualitative data was presented as frequency and percentages. **Results:** The prevalence of medial pain elbow pain came out to be 38.8% (103 participants), 30 (11.2%) were having mild pain, 64 (23.9%) moderate, 9 (3.4%) severe while 165 (61.5%) were free from medial elbow pain. **Conclusion:** This study showed that the prevalence of medial elbow pain in professional taxi drivers was 38.4% and affected the activities of daily living of drivers. Most drivers reported the pain within mild to moderate range. Pain in the medial aspect of the elbow can arise in taxi drivers due to the nature of their work and factors such as long working hours, prolonged sitting, whole body vibration and poor ergonomic design of taxi.

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INTRODUCTION

Pain in the medial side of the elbow is not very common in the general population. Prevalence of medial epicondylitis came out to be less than one percent and has been intended to be one-third as common as lateral epicondylitis.[1] Some groups of the population are at a relatively greater risk of suffering from medial elbow pain that includes professional drivers, carpenters, plumbers, tailors, telephone switchboard workers, glass cutters, artists, musicians and overhead athletes.[2,3] They come under the spell of work-related problems.[4] Prolonged elbow flexion, repetitive motion and undeviating compression on the ulnar nerve increase the threat of ulnar nerve entrapment and neuropathy in such occupations.[3,5,6]

The most distinctive reason is sustained flexion at the elbow resulting in nerve traction and causing direct ulnar nerve trauma at the elbow, when the driver rests and leans profoundly on his elbow, thus constricting the ulnar nerve at its apparent path.[3, 7]Some people with medial elbow pain might also have some pathology, which may include medial collateral ligament insufficiency or chronic signs of impingement also called chronic valgus overload syndrome. Acute medial elbow instability is frequently an obvious and distinct diagnosis but progressive weakness might be an ongoing progression.[8]

Pain in the medial aspect of the elbow might also be triggered by ulnar nerve complications, which comprise neuritis and neuropathy with or without nerve displacement. The medial ante-brachial cutaneous nerve has also been reported to be one of the causes of pain in the medial aspect of the elbow. Some other diagnoses that might yield this pain are manifestations of osteophytes, medial epicondyle avulsion fractures, ulno-humeral arthritis or a very occasional condition osteochondritis dissecans of the trochlea.[9] Not as much of a frequent cause of pain in the medial side of the elbow is medial collateral ligament injury. Repetitive valgus stress on the elbow joint might lead to micro-traumatic and valgus instability. When the medial collateral ligament gets disordered, irregular stress is placed on the articular exteriors which might lead to deteriorating changes with osteophyte development.[10] Having multiple causes in nature can add a lot of trials and challenges in clinical diagnoses, especially in the absenteeism of one specific contributing factor. Sadhra proclaims that not as much as 10 percent of the cases have a recognizable cause or might be directly credited to a chief event.

The symptoms might appear as a result of discomfort or acute pain following an activity or adapting to an awkward posture or as a result of forceful physical exertion with which the person might be unfamiliar which results in sprain, strain or any biomechanical constraint.[11] The sensation of pain on the medial side of the elbow might be a source of disability in professional taxi drivers.[12] These are at a higher risk of developing pain due to certain risk factors such as whole-body vibration, prolonged sitting, repetitive movements that include a combination of wrist flexion with pronation of the forearm and awkward posture.[2,4,13] Professional taxi drivers are a sub-category of professional drivers who are exposed to an assortment of physical, mental and psychosocial vulnerabilities.

Most of the work done on taxi drivers was on physical assault, violence, and whole-body vibrations.[14] Specifically talking about elbow pain in taxi drivers, sustained flexion of the elbow and routinely inclining and leaning the left elbow might be the reason for electro-diagnostically diagnosed ulnar entrapment neuropathy in taxi drivers.[3] Though the

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detailed prevalence and incidence remain unidentified, the ulnar nerve entrapment neuropathy at the elbow joint is the second most common peripheral entrapment neuropathy, subsequent the carpal tunnel syndrome.[15,16] The factors which are associated with pathomechanics of the ulnar nerve entrapment are subluxation/dislocation, compression and traction of the ulnar nerve at the cubital tunnel during repetitive and sustained flexion of the elbow.[17] Additionally, mechanical pressure applied directly on the ulnar nerve distresses the blood supply of the nerve and leads to localized ischemia, which eventually causes neuropathy.[18]

Various studies have been conducted to find out the prevalence, associated risk factors and musculoskeletal symptoms among occupational drivers.[19] A prevalence study showed that the prevalence of lower back pain was high among drivers and its relationship with driving postures.[20] This study was conducted to find out the prevalence of medial elbow pain in taxi drivers of Lahore, the hindrance that the medial elbow pain causes in performing activities of daily living, moreover, whether arm straightening or elbow flexion for an extended period causes medial elbow pain. This study was also conducted to point out whether medial elbow pain is concomitant with the nature of work of taxi drivers, their long working hours, prolonged sitting, whole body vibrations and poor ergonomic design of the taxi. The purpose of the study was to find the prevalence of medial elbow pain in taxi drivers in Lahore.

METHODS

The sample size was calculated through Epi Info Software, the confidence interval was set at 95%, design effect-1, cluster 1 and the margin of error at 5, i.e. 0.5%. The sample size was calculated to be 268 participants. Questionnaires were given to taxi drivers who were recruited through convenient sampling. Consent forms, both in Urdu and English were explained before data collection. Taxi drivers were inquired about pain on the medial side of their elbow, numbness in the little finger, difficulties in activities of daily living, pain during or after driving and how much this has affected activities of daily routine. Data was collected from various taxi drivers in Lahore. Professional participants who had taxi driving as an occupation and who were working for two years were involved in this study.

To fulfill the criteria of a sample size that was 268 the record of taxi drivers was also gathered from the e-record of Uber and Careem, Lahore. Taxi drivers of age 20 to 55 years, both gender and those who had working hours of 5 to 8 or more hours were included in this study. Drivers who had any recent traumatic injury or had been in a recent road traffic accident, undergone surgery were excluded from this study.

The outcome measuring was visual analogue scale (VAS) for pain rating. The reliability of this scale for pain measurement as evaluated by interclass correlation coefficient appears to be high. So this scale is found to be satisfactorily reliable for assessment of pain.[21] Data was analyzed by SPSS version 23, qualitative data was presented as frequency and percentages.

RESULTS

The mean age of 268 taxi drivers who were involved in this study was found to be 52.98± 20.79 years. Taxi drivers were inquired about whether they had pain in the medial aspect of the elbow while they were driving. Out of 268 taxi drivers, 130 participants had no pain while driving, 124 had moderate pain and 14

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taxi drivers reported having severe pain (Table I).

Table I: Descriptive Statistics of Pain during Driving

Pain Intensity	Frequency	Percent
No pain (0)	130	48.5%
Mild pain (1-3)	0	-
Moderate Pain (4-6)	124	46.3%
Severe Pain (7-10)	14	5.2%
Total	268	100%

The taxi drivers were inquired after driving a taxi for prolonged hours whether they felt weakness in their hands or not. Out of 268 taxi drivers, 132 reported no weakness in their hands, 34 taxi drivers reported mild weakness, 67 moderate weakness and 35 taxi drivers reported severe weakness in their hands after driving a taxi for prolonged hours (Table II).

Table II: Descriptive Statistics for Weakness in The Hands After Driving for Prolonged Hours

Hand weakness	Frequency	Percent
No feeling	132	49.3%
Mild feeling	34	12.7%
Moderate feeling	67	25.0%
Severe feeling	35	13.1%
Total	268	100%

The taxi drivers were also inquired whether they felt pain while they eat since the focus was also to find out how much this pain has affected the activities of daily living. Out of 268 taxi drivers 187 reported no pain while eating, 35 taxi drivers having mild pain, 40 having moderate pain and 6 taxi drivers reported severe pain while they eat (Table III).

Table III: Descriptive statistics for Pain in the Medial Aspect of the Elbow while Eating

Pain Intensity	Frequency	Percent
No pain (0)	189	69.8%
Mild pain (1-3)	35	13.1%
Moderate pain (4-6)	40	14.9%
Severe pain (7-10)	6	2.2%
Total	268	100%

Taxi drivers were also inquired to tell whether they have pain in the medial aspect of the elbow all the time as they are professional drivers and drive for long hours. Out of 268 taxi drivers, 165 reported no pain, the reasons behind this might be their young age which needs further justified study and this needs further comprehension. About 30 participants reported mild pain, 64 moderate pain and 9 severe pain (Table IV).

Table IV: Descriptive Statistics for Pain in Medial Aspect of Elbow all the time

Pain Intensity	Frequency	Percent
No pain (0)	165	61.6%
Mild pain (1-3)	30	11.2%
Moderate pain (4-6)	64	23.9%
Severe pain (7-10)	9	3.4%
Total	268	100%

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A chi-square test was applied, it showed a significance of ≤0.001 which is a highly significant and displayed high prevalence of medial elbow pain in taxi drivers.When taxi drivers who reported pain in their medial elbows were asked about do they associate this pain with their nature of work they all reported yes to the question, that this pain is associated with the nature of their work (Table V).

Table V: Association of Medial Elbow Pain with Nature of Work as a Professional Taxi Driver

Pain Intensity	Frequency	Percent
Yes	103	38.4%
No	165	61.56%
Total	298	100%

DISCUSSION

Evidence showed the prevalence of medial elbow pain and medial epicondylitis in various kinds of populations such as in the meat processing industry and young throwing athletes were calculated.[22,23] This study showed that pain in the medial elbow is associated with the nature of the work of the taxi drivers (Table V) with prolonged elbow flexion, repetitive elbow movements and undeviating compression on the ulnar nerve, although this problem has been rarely discussed in the literature considering the taxi drivers who drive for a longer duration. But this is an increasing clinical problem that needs more attention.

Afsar and his co-workers conducted a study to inspect the occurrence of ulnar nerve entrapment neuropathy at the elbow in taxi drivers ultimately leading to medial elbow pain and its association with taxi drivers' habitually keeping their elbow in flexed position for prolonged hours and leaning their left elbow on the inferior edge of the window.[3]

They concluded that keeping the elbow in prolonged flexion and consistently slanting the left elbow might cause electro-diagnostically diagnosed ulnar nerve entrapment neuropathy in taxi drivers, which proved that this is certainly a work-related problem.[3] The current study also concluded that medial elbow pain in taxi drivers is due to their nature of work and prolonged driving hours. Joanna and her co-workers concluded that psychosocial and physical factors such as repetitive work, force and working hours are positive indicators of the prevalence of musculoskeletal complaints in any profession.

A lot of factors at the workplace which are psychosocial may play a role and increase the work-related physical load. This study also exhibited that medial elbow pain is work-related so it makes a strong connection between medial elbow pain in taxi drivers and their nature of work.[24] A study conducted by Jun Sakata et al. to recognize the risk factors associated with a medial elbow injury and pain in baseball players.

They concluded that the occurrence of initial elbow injury was 22.1%. The age of the baseball players, thoracic kyphosis angle, number of throws per day and extension of the elbow insufficiency are recently identified risk factors associated with their physical function.[25] The current study also recommend upgrading in posture and initial recognition of a hushed elbow extension discrepancy to avoid injury at the medial aspect of the elbow. When a taxi driver sits in a vehicle, the driver must adjust the seat by making his spine straight and care should be taken that the driver sits not too high or low from the steering wheel.[26] The driver's hands must be positioned in such a way that

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is easy and restful for the shoulder, elbow and neck support.

The arms and elbows should be comfortable and relaxed with the gentle bend in the elbow to decrease the mechanical load off the shoulders, elbows and spine.[27] This study highly recommends following the suggested guidelines on how to sit while driving. In another study, Ayman et al. find out the prevalence of lower back pain among car drivers with the wrong driving position in Taif, Saudia Arabia. They concluded that the prevalence of lower back pain was high among car drivers.[20] Both studies demand establishing health care education and awareness programs about musculoskeletal pain and discomfort in professional drivers and their associated risk factors.[20] Evaluation of driving postures and their ergonomics and measures needed to prevent them are required to reduce the incidence of all musculoskeletal discomfort in professional drivers.

The major limitation of this study is generalizability of findings as female drivers were not available in this population. This study also had some other limitations as it did not consider many other factors such as more detailed occupational-related activities, sitting positions in places other than in cars, diet, chronic diseases, physical activities, body mass index, psychological factors, job dissatisfaction, sleep patterns socio-economic status, which are really important contributing factors.[28-30]

Thus, this may have created a confounding bias. Future researchers are recommended to conduct a study that might include random sampling of the taxi drivers including both genders and a much larger sample size to obtain more accurate and generalizeable results. This study also recommends calls for embedding health education and awareness programs about medial elbow pain and its risk factors. Moreover, studies should be conducted to find out the association of factors such as long working hours, prolonged sitting, whole body vibrations and poor ergonomic design of taxi with medial elbow pain more specifically. Future researchers are also recommended to conduct efficacy studies to build up preventive programs to reduce medial injuries and pain in taxi drivers.

CONCLUSION

This study showed that the prevalence of medial elbow pain in professional taxi drivers was 38.4%. Most taxi drivers reported the pain within the mild to moderate range. This study also concluded that medial elbow pain affected the activities of daily living of taxi drivers. Medial elbow in taxi drivers might arise owing to the nature of their work and factors such as long working hours, prolonged seating, whole body vibrations and poor ergonomic design of taxi.

DECLARATIONS

Consent to participate: Written consent had been taken from patients. All methods were performed following the relevant guidelines and regulations.
Availability of data and materials: Data will be available on request. The corresponding author will submit all dataset files.
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