



Prevalence of Cubital Tunnel Syndrome in Plumbers

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Abstract

Background: Cubital Tunnel Syndrome (CBTS) is a condition when the ulnar nerve is compressed, usually at the elbow level passing behind the humerus's medial epicondyle. Its prevalence in the plumbing population is unknown. In the population of plumbers, their occupation may put them at increased risk due to the repetitive motions and prolonged use of the elbow joint, thus there is a need to find prevalence of CBTS in plumbers. **Material and Methods:** In all, 88 plumbers were involved in this cross-sectional study, and everyone was taken for the study according to their age greater than 35 years and having working experience of at least 1 year. A method for diagnosing cubital tunnel syndrome was a patient-rated ulnar nerve evaluation scale. **Result:** 88 plumbers participated in this cross-sectional survey. 12.5% of the 88 plumbers that were surveyed had Cubital Tunnel Syndrome symptoms. **Conclusion:** The prevalence of suggestive diagnosis of cubital tunnel syndrome was 12.5% and was higher in plumbers working more than 10 years.

Keywords: Compressive Neuropathy, Cubital Tunnel Syndrome, Plumbers, Ulnar Nerve

1. Introduction

Cubital tunnel syndrome is a chronic condition that causes discomfort, numbness, and hand weakness. After carpal tunnel syndrome, peripheral neuropathy of the upper extremity has the highest prevalence. It is caused by ulnar nerve entrapment at the elbow level as it passes behind the medial epicondyle of the humerus, as well as strain from extended elbow flexion. The prevalence of Cubital tunnel syndrome in the U.S. is 5.9%¹. It has been connected to specific occupations, advancing age, and the male gender. Anatomically, the ulnar nerve is vulnerable in the dorsal aspect of the elbow, where it is subject to stresses from both compression and stretching. Sensory abnormalities like paraesthesia and mild hypoesthesia are recorded in the early stages of CBTS¹.

Even though its true prevalence is uncertain, telephone operators, drivers, workers in the shoe industry, a bamboo

toy factory, a factory that makes surgical suture thread, and those who handle vibratory tools, and other tools, or who maintain the same position for an extended period, like plumbers, are among the more vulnerable groups^{2,3}.

Compression neuropathy CBTS affects the area around the cubital tunnel⁴. The early symptoms of CBTS are typically tingling and numbness in the ring and fifth fingers. Sometimes at night, these symptoms worsen⁵. Early diagnosis with mild CBTS may be able to avoid surgical intervention.

The quality of life is negatively impacted by the severity of the symptoms, which might include weakness and loss of fine motor skills. Ulnar discomfort can originate from the cervical nerve roots as they emerge from the spinal cord, the brachial plexus, the thoracic outlet, or further down the upper limb in the arm, elbow, forearm, or wrist. Repeated and prolonged elbow flexion may cause ulnar nerve irritation and then lead to CBTS development.

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Repetitive elbow flexion makes CBTS symptoms worse. While elderly patients usually have chronic motor difficulties, younger people frequently have more acute symptoms. Additionally, there might be pain and point soreness at the medial elbow⁶.

Men tend to have more cases of CBTS than women do because they have a larger fatty pad above the elbow and a more pronounced tuberculum of the coronoid process. CBTS is more common in patients who use a tool constantly, undertake repetitive duties, or are obese⁷. A disorder that often leads individuals to seek hand surgery therapy is symptomatic CBTS⁸.

It will be easier to evaluate patients and choose the best course of action if one is aware of the anatomy and pathophysiology of cubital tunnel syndrome⁹. The pathology's site of origin frequently dictates available treatments. Treatments such as physical therapy, bracing, and injections that don't involve surgery are beneficial to a lot of people. Surgical nerve release at the entrapment site should be considered if these non-invasive techniques are not successful, or if the level of sensory or motor impairment increases. Both nerve transposition at the elbow and surgical release are possible¹⁰. We might be able to better design treatment for patients in the future if we have greater knowledge regarding the pathophysiology of CBTS, such as the differences between traction and compression injuries, and improved neural evaluation modalities¹¹.

Factors that put people at risk for elbow ulnar mononeuropathy. ulnar mononeuropathy at the elbow: risk variables for gender, body mass, and age. Research on the relationships between the four distinct tendino- and neuropathies of the elbow and psychosocial factors is limited, despite the fact that a variety of psychosocial work factors have been shown to affect elbow, wrist, and hand symptoms. In the first medical interaction, efforts should be made to accurately identify UNE and maximise functional recovery. To determine the best course of treatment, careful consideration of the patient's medical history, physical examination results, and diagnostic test results is essential¹²⁻¹⁵. Thus, to stop the disease from progressing further and lessen the chance of a reduced quality of life, a precise and appropriate diagnosis and treatment of CBTS are required¹⁶.

Plumbers work by bending their elbows and holding their tools for extended periods. This ache may be felt near the elbow or cubital tunnel. Repeated and prolonged elbow flexion may cause ulnar nerve irritation, which

may lead to the development of CBTS. The symptoms and warning indications of CBTS in plumbers are often disregarded. Since CBTS is frequently misdiagnosed in plumbers. If plumbers don't notice the symptoms and do not get treated it can worsen the CBTS.

2. Materials and Methods

There were 88 participants in total for this cross-sectional study. Plumbers who were chosen using a simple random selection technique made up the study population. There was a six-month study period. Our main objective was to find the prevalence of Cubital tunnel syndrome in plumbers.

Inclusion Criteria

- Age -more than 35-50 years.
- Only male participants.
- Participants who have been working as full-time plumbers for more than 1 year.

Exclusion Criteria

- Participants who have undergone operative procedures.
- Participants with any recent history of trauma, road traffic accidents.

All participants provided written consent once the selection criteria were taken into account, and outcome measurements were then taken.

3. Procedure

The institutional ethical committee of KIMSDU provided the ethical approval (KIMSDU/IEC/05/2023). Those meeting the inclusion requirements were chosen after approaching potential candidates. Individuals who desired to take part were educated about the procedure and asked to sign a written consent form. Participants' demographic data was collected. Both the purpose of the study and its methodology were explained to the participants. Each of them was told about the Patient-Rated Ulnar Nerve Evaluation scale (PRUNE). Data were recorded.

Outcome Measures

Patient-Rated Ulnar Nerve Evaluation Scale (PRUNE)

4. Result

In this study, 88 plumbers were interviewed all of them were male and aged 35 to 50 years old. Only the plumbers who work for more than a 1 year. This survey was conducted by providing and explaining the questionnaire to plumbers. Results are calculated as per the interpretation of the patient-rated ulnar nerve evaluation scale.

88 plumbers filled out the questionnaire. Table 1 represents socio-demographic data that includes age, gender, hand dominance, and duration of work. The age group between 41 and 50 was more affected by or prone to CBTS. Of the 88 plumbers, twenty-six per cent were left-handed and seventy-three per cent were right-handed. The CBTS had a greater effect on plumbers with over ten years of experience (54%).

Among 88 plumbers, 44.31% (n = 42) plumbers had symptoms of pain; 23.86% (n = 21) plumbers had aching pain at the elbow; 7.95% (n = 7) plumbers had numbness and tingling sensations; 3.40% (n = 3) plumbers had a weak grip and clumsiness; and 44.31% (n = 39) plumbers had no symptoms. In the patient-rated ulnar evaluation scale, each item is scored on a scale from zero to 10. The outcome measures used for results were PRUNE scales.

According to the patient-rated ulnar nerve evaluation scale, scores higher than 30 showed severe residual

symptoms of Cubital tunnel syndrome. This study found that 12.5% of plumbers were symptomatic of CBTS, and 88% were asymptomatic of CBTS.

5. Discussion

This study was conducted to see the prevalence of cubital tunnel syndrome in plumbers.

Among the plumbers selected for the study, those who had been working for more than 10 years were more susceptible to CBTS. Based on this cross-sectional study, 12.5% of plumbers showed signs that align with cubital tunnel syndrome. The results indicated a suggestive diagnosis of CBTS in 12.5% of the sample. This rate is higher than the one reported by Rijn *et al*¹. CBTS rates among floor cleaners were 6.8% according to a comprehensive review. It is unknown how common CBTS are in people worldwide. The incidence of CBTS was 5.9% in a cohort study conducted by Tonya W *et al*¹. The study of Regina Yumi Saito *et al.*,² supports that longer lengths in the job (over one year) were more prone to CBTS.

In this study, plumbers were involved. As they work by repetitive motion of elbow flexion in their occupation, this correlates with the study of Descatha *et al.*,⁴ also says that holding a tool in place repeatedly is one biomechanical risk factor linked to the occurrence of ulnar nerve entrapment at the elbow. In the present study, the plumbers selected had worked for more than one year. 40 plumbers have been working for 1–10 years and 48 plumbers have been working for 11–30 years. The plumbers who had been working for more than 10 years were more prone to CBTS.

Patients with CBTS are four times more likely to show symptoms, according to Boone *et al*⁵. It includes advanced illnesses, like muscular atrophy and decreased feeling. Chronic CBTS that is left untreated can result in subsequent joint contractures, muscular weakening, and a permanent loss of sensitivity. We discovered several connections between CBTS and plumbers who have been employed for more than one year these factors may include age, work type and intensity, and how often it is done.

In the present study, only male plumbers were included, and the population of male plumbers was more susceptible to CBTS. One study by Richardson *et al.*,¹⁰ reported that the male gender was associated with an increased probability of having CBTS.

Table 1. Demographic variables in the study

Demographics variable	Age	No. of plumbers	Percentage (%)
Age	35-40	61	69.31
	41-45	24	27.27%
	46-50	3	3.40%
Dominant Hand	Right hand	65	73.86%
	Left hand	23	26.13%
Plumber who are working >1 year	1-10	40	45.5%
	11-20	47	53.4%
	21-30	1	1.13%
Symptoms	1. Pain	42	44.3%
	2. Aching pain	21	23.8%
	3. Numbness and tingling sensation	7	7.9%
	4. Weak grip and clumsiness	3	3.4%
	5. No any symptoms	39	44.3%

The plumbers included in this study were between 35-50 years old. However, of the 88 plumbers, 61 were between the ages of 35 and 40, and 28 were between the ages of 41 and 50. Plumbers over the age of 40 were the most affected. This correlates with the study of Bartels RH *et al.*,¹² which also says that the higher frequency of CBTS in the age range of 40 to 50, which is the end of the fifth decade of life.

In a study by Juratli *et al.*,¹³ early diagnosis is very important, as the likelihood of returning to work was 13% greater for those who were diagnosed early and 35% lower for those who were 50 or older at the time of diagnosis than for those who were under 30. As per these study results, prevalent plumbers had been working for more than 10 years. To improve their prognosis, older workers should receive extra consideration. To stop the progression of the disease, early diagnosis is very important.

6. Conclusion

The prevalence of the suggestive diagnosis of Cubital tunnel syndrome was 12.5% and was higher in plumbers working for more than 10 years.

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8. Ethical approval

The Institutional Ethical Committee of KIMS DTU granted ethical approval with protocol number 630/2022-2023.

9. References

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