Research Article

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A study on carpal tunnel syndrome among diabetes patients in tertiary care hospital

Paranthakan C.¹, Govindarajan P. K.²*

¹Department of Internal Medicine, Thanjavur Medical College, Thanjavur, Tamilnadu 613004, India

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*Correspondence: Dr. Govindarajan P.K., E-mail: drpkgr@gmail.com

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ABSTRACT

Background: The carpal tunnel syndrome (CTS) is one of the major problems in diabetes mellitus. There are certain risk factors like age, sex, status of diabetes influence the occurrence of carpal tunnel syndrome among diabetes.

Methods: This study was conducted among 106 diabetes patients attending tertiary care hospital diabetes OPD to find out occurrence of CTS. The patients were selected randomly. The clinical examination of CTS along with electro diagnostic study was done. The blood investigation like blood sugar, HbA1c and Thyroid function were performed. The statistical analysis as Chi-square test was applied.

Results: Among the study population 56% were female and 44% were male. The prevalence of carpal tunnel syndrome was 19.8% according to electro diagnostic study among diabetes patients. The carpal tunnel syndrome found in 29% of the female compare to 9% among male, this increase occurrence in female was statistically significant. This study found out the uncontrolled diabetes was one of the major risk factor for CTS.

Conclusions: The uncontrolled diabetes rather than duration of the diabetes is also major cause for CTS. It is the duty of the physician and the patient to control the diabetes to prevent the CTS.

Keywords: Carpal, Diabetes, Electrodiagnostic study

INTRODUCTION

Carpal tunnel syndrome (CTS) arises from the compression of the median nerve when it passes through the carpal tunnel in the wrist. It is characterized by sensory and, less commonly, motor symptoms and signs in the peripheral distribution of the median nerve. It is the most common compressive neuropathy of the upper limb and an increasingly recognized cause of work disability. It is the commonest entrapment neuropathy and the most common cause for an electro diagnostic study referral.

A constellation of symptoms and signs can be presented in patients with CTS. Female sex is more affected than

the male. It is usually bilateral but dominant hand affection is more when compared than the non-dominant one. A common complaint is wrist pain and pain in the arm and is associated with hand paresthesias. The pain usually radiates to the arm, forearm and shoulder. Notably, the neck is not affected. A diffuse, no localizing pain involving the entire limb is also a complaint. The little finger is spared if pointedly asked about its involvement. Ordinary activities like phone holding, car driving, holding a book or newspaper itself can trigger the symptoms.

CTS is a common problem with an estimated annual incidence rate of 0.5-5.1 per 1000.²

²Department of Community Medicine, Raja Muthiah Medical College, Annamalai University, Annamalainagar, Tamilnadu 608002, India

Predisposition factors include diabetes mellitus, hypothyroidism, renal disease, alcoholism, rheumatoid arthritis, obesity, pregnancy and menopause. Carpel tunnel syndrome (CTS) occurs in 2% of the general population 14% of diabetic subjects without diabetic neuropathy and 30% of diabetic subjects with diabetic polyneuropathy.³

In advanced, severe cases, of CTS where the course is unnoticed, the patient can go in for atrophy of the thenar muscles which can be irreversible. The purpose of the study was to identify the CTS in early on set to prevent progression among diabetes patients.

METHODS

Study design

This is a descriptive study conducted at Thanjavur Medical College & hospital, Thanjavur.

Study population

All diabetic mellitus patients attending diabetic OPD.

Case definition

Patients both male and female with confirmed diabetes, type 1 or type 2 with or without neuropathic symptoms, involving upper limb or lower limb, less than or more than 5 years duration of the disease are included.

Inclusion criteria

Patients above 13 years of age and who are known diabetic on treatment attending diabetic OPD were included in the study.

Exclusion criteria

Patients below 13 years of age and patients having secondary diabetes were excluded from the study.

Patients with obesity, hypothyroidism, rheumatoid arthritis, joint deformities, fractures in lower forearm-colles, history of septic arthritis, occupational stress and other causes causing peripheral neuropathy including familial causes.

Sample size

All diabetics with above inclusion and exclusion criteria-106 cases were selected randomly.

Ethical committee clearance was obtained from the Institutional Ethical Committee.

Detailed history regarding the diabetic history, treatment history, duration of the illness, symptoms relating to neuropathy confined to upper limb or lower limb. History of hemodialysis previously was obtained

Examination

All cases were examined, their height, weight, BMI was calculated. Neck examination done to rule out goiter. Symptoms relating to median neuropathy at wrist were examined. Phalen's sign, Tinel sign and hyperesthesia over the lateral three and half fingers was noted.

Investigations

Latest fasting and post prandial blood sugar, HbA1c, thyroid function test, renal function test, nerve conduction study of the median nerve at the wrist combined with palm-wrist comparison study, ulnar-median comparison study and other specific internal comparison studies. The study was mainly supported by the electro diagnostic study to arrive at a diagnosis of carpal tunnel syndrome, according to the protocol devised by the American Diabetic Association. Routine electro diagnostic test and comparison electro diagnostic test was conducted to elicit carpal tunnel syndrome.

RESULTS

The present study was conducted to find out the prevalence of the carpal tunnel syndrome among diabetic patients. Among the study population of 106, 68% were in the age group between 41 and 60 (Table 1).

Table 1: Age distribution in the diabetic population.

Age in years	Frequency	Percentage
Less than 30	04	04
31 to 40	06	06
41 to 50	37	35
51 to 60	35	33
61 to 70	20	19
Above 71	04	04
Total	106	100

56% were female and 44% were male in the study population. Nearly 92% were belonging to Type 2 Diabetes mellitus and 8% were belonging to Type 1 Diabetes mellitus. About 59% were not under control of diabetes as per the records and also according to HbA1c. Among 106 diabetes patients 21 (19.8%) people were suffering from carpal tunnel syndrome.

The occurrence of carpal tunnel syndrome was 19.8% among diabetes mellitus according to comparison electro diagnostic study but clinical assessment has identified only 11.3%. The routine electro diagnostic study has found the prevalence of carpal tunnel syndrome was 15%. The carpal tunnel syndrome found in 29% of the female compare to 9% among male, this increase occurrence in female was statistically significant. There was statistical significant association between symptoms of the disease and presence of disease (Table 2).

Table 2: Status of symptoms of carpal tunnel syndrome.

Status of symptom	Disease present	Disease absent	Total
Asymptomatic	02	43	45
Symptomatic	19	42	61
Total	21	85	106

P value-0.0005

The disease was more among the people who did not have control of diabetes and it was statistically significant as shown in Table 3.

Table 3: Status of control of diabetes and occurrence of CTS.

Status of control of diabetes	Disease present	Disease absent	Total
Control	01	44	45
No control	20	41	61
Total	21	85	106

Chi-square value 13.3, P - value 0.0003

41% of the patients were suffering from diabetes less than 5 years and 59% were suffering from more than 5 years but the duration of diabetes was not associated with occurrence of carpal tunnel syndrome and it was statistically proved as shown in Table 4.

Table 4: Duration diabetes among study population.

Duration of diabetes	Disease present	Disease absent	Total
Less than 5 years	05	38	43
More than 5 years	16	47	63
Total	21	85	106

Chi-square value 2.25, P-value 0.13

DISCUSSION

The present study was conducted among 106 Diabetes mellitus patients and it has found that 19.8% were suffering from carpal tunnel syndrome according to comparison electro diagnostic study. This is very close to 16% a study conducted by Ayflin Öge et al at Turkey.⁴ This prevalence is little lower than 25.53% a study conducted by Akulwar AS et al.⁵ The clinical assessment has found out only 11.3% of carpal tunnel syndrome among diabetes compare to comparison electro diagnostic study, this difference in identification also observed by Akulwar.⁵ In this study routine electro diagnostic study has identified less number of carpal tunnel syndrome compare to comparison electro diagnostic study. The occurrence of carpal tunnel syndrome is observed in this study more in female than male and this observation coincides with the study conducted by Akulwar AS, et al.⁵ The present study has found that uncontrolled diabetes is also a risk factor for carpal tunnel syndrome as the study observed the CTS found more in uncontrolled diabetes. The study did not find any relation between the duration of the diabetes and occurrence of CTS and this observation was found also by Ayflin Öge et al, but Akulwar has observed in his study that increase of occurrence of CTS in duration of diabetes.^{4,5} This study also has found out that the electro diagnostic study identified the CTS more and accurately among those who have symptoms than asymptomatic patients.

CONCLUSION

The occurrence of CTS among one fourth of the diabetes patients is proved by various studies. This problem along with other complication also gives burden on the patients. The uncontrolled diabetes rather than duration of the diabetes is also major cause for the CTS. It is the duty of the physician and the patient to control the diabetes to prevent the CTS. Certain proportion of asymptomatic patients also may have CTS which gives suggestion to go for electro diagnostic study and also clinical examination yields low percentage of identification which suggests performing electro diagnostic study.

The study was conducted in small sample size which may alter the observation.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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