

A CROSS-SECTIONAL STUDY ON THE PREVALENCE OF DISTAL SENSORY NEUROPATHY IN ASYMPTOMATIC TYPE 2 DIABETES PATIENTS IN A TERTIARY CARE CENTRE

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ABSTRACT

OBJECTIVE

To determine the prevalence of Distal Sensory neuropathy in asymptomatic Type 2 Diabetes mellitus.

METHODOLOGY

Patients with type 2 diabetes mellitus attending outpatient Department of Government Vellore Medical College Hospital without symptoms of peripheral neuropathy were included in this study. The presence of diabetic neuropathy was diagnosed using Michigan Neuropathy Screening Instrument (MNSI) Score.

RESULTS

A total of 400 patients with type 2 diabetes mellitus were studied of which 216 (54%) were males and 184 (46%) were females. Mean age of males was significantly higher than females (51±9.1 years vs. 44±7.6 years, p<0.05). The mean BMI of females was significantly higher for females than males (28.4±4.2 vs. 25.3±2.9, p<0.05). In our study, 72 patients (18%) had asymptomatic peripheral neuropathy.

CONCLUSION

Peripheral neuropathy is common in asymptomatic diabetic patients. All patients with diabetes mellitus needs active screening for peripheral neuropathy to reduce the morbidity associated with it.

KEYWORDS

MNSI Scoring, Semmes-Weinstein Monofilament, Neuropathy, Diabetes Mellitus.

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INTRODUCTION

Diabetes Mellitus has become a global epidemic. There are currently an estimated number of more than 69.1 million people suffering from this disease in India.¹ By the year 2030, it is estimated that there will be nearly 80 million Indians with Diabetes. It is associated with more than two fold excess mortality from cardiovascular disease, devastating microvascular complication affecting the eyes, kidney and nerves as well as comorbidity including cancer, infection and psychosocial stress.

Diabetic Peripheral Neuropathy (DPN) is one of the commonest symptomatic complications of Diabetes.^{2,3} Prevalence of Diabetic peripheral Neuropathy is 15 to 50 percent in various studies.^{4,5} It predisposes to foot ulceration and gangrene. Type 2 Diabetes Mellitus is characterised by long asymptomatic phase (ranges from 4 to 7 years) between the actual onset of hyperglycaemia and clinical diagnosis, which may explain the relatively high prevalence of microvascular complication in newly-diagnosed patients with

Type 2 Diabetes Mellitus. In view of poor awareness and lack of regular screening programmes, the initial presentation to the physicians is delayed frequently. This may predispose to increased rate of microvascular complication at onset.

There is an emerging evidence that Peripheral Neuropathy begins in the early stages of Diabetes pathogenesis and remains asymptomatic during the course of the disease. Early detection of peripheral neuropathy and appropriate management of the same would reduce the complication of foot ulcers.^{6,7} As per previous studies on diabetes mellitus, 3% of patients presented with overt neuropathy, 10% presented with borderline neuropathy at the time of diagnosis of diabetes mellitus and another 10% of patients subsequently developed neuropathy.^{8,9} Hence, this study aims at screening peripheral neuropathy and determine the prevalence of the disease in asymptomatic diabetic population.

METHODOLOGY

This cross-sectional study was done on patients attending the diabetic clinic and medical OPD at Govt. Vellore Medical College Hospital from March 2016 to August 2016. Known patients of type 2 diabetes mellitus without any symptom of peripheral neuropathy at the time of examination were included after obtaining informed consent. Patients with type 1 diabetes mellitus, vitamin B12 deficiency, hypothyroidism, uraemia, HIV disease, malignancy, tuberculosis, chronic alcoholism, pregnancy, Hansen's disease and those taking drugs that cause peripheral neuropathy were excluded from the study. Patient's age, gender, history of smoking and

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alcoholism, height, weight, BMI and blood pressure were recorded. A detailed clinical examination was performed. Blood samples were taken for fasting and postprandial blood glucose, HbA1C levels and lipid profile. Diagnosis of diabetes mellitus made as per the ADA criteria. All patients were examined for appearance of feet, presence of ulcerations, vibration perception, ankle reflexes and monofilament. Based on the above-mentioned parameters, MNSI scoring was done. A diagnosis of peripheral neuropathy was made when the MNSI scoring ≥ 2 out of 10.

RESULTS

A total sample of 400 patients were studied. Of this, 216 (54%) were males and 184 (46%) were females. Mean age of males was 51 ± 9.1 years and that of females was 44 ± 7.6 years. The mean age of females was significantly lesser than the mean age of males ($p < 0.05$). The mean BMI of males was 25.3 ± 2.9 and that of females was 28.4 ± 4.2 . The mean systolic blood pressure of males was 136.6 ± 15.2 mmHg and that of females was 127.4 ± 13.1 mmHg. The mean diastolic blood pressure of males was 83 ± 10.4 mmHg and that of females was 82 ± 9.8 mmHg. The mean systolic blood pressure is significantly higher in males than females ($p < 0.05$). Of the total sample of 400 subjects, 166 patients (41.5%) had systemic hypertension. Among those with hypertension, 96 patients (57.8%) were males and 70 patients (42.1%) were females and this difference is statistically significant ($p < 0.05$). 72 patients (18%) had a MNSI score of more than 2 suggesting the presence of peripheral neuropathy. Of these 72 patients with peripheral neuropathy, 38 (52.7%) were males and 34 (47.22%) were females ($p > 0.05$).

Variables	Males	Females	P Value
Mean Age in Years	51 ± 9.1	44 ± 7.6	< 0.05
BMI	25.3 ± 2.9	28.4 ± 4.2	< 0.05
Systolic BP (mmHg)	136.6 ± 15.2	127.4 ± 13.1	< 0.05
Diastolic BP (mmHg)	83 ± 10.4	82 ± 9.8	> 0.05
MNSI Score > 2	52.7%	47.2%	> 0.05

Table 1: Demographic Data

DISCUSSION

Our study which was done in a tertiary care hospital showed that the prevalence of diabetic peripheral neuropathy among asymptomatic patients is 18%. There was no statistically significant difference in the prevalence of asymptomatic peripheral neuropathy between males and females. Thus, both genders are equally susceptible to diabetic peripheral neuropathy. The prevalence of asymptomatic peripheral neuropathy was 14.4% in the study done by Rehan Ahmed et al¹⁰ where the diagnosis of neuropathy was made using only the SW monofilament examination. In our study, the diagnosis of peripheral neuropathy was done using MNSI¹¹ scoring system, which is a better predictor than monofilament examination alone.¹² The mean BMI of the females is significantly higher than the mean BMI of males. The prevalence of systemic hypertension is significantly higher in males than females. Autonomic neuropathy, cranial neuropathy and multifocal motor neuropathy have been documented to present asymptotically.^{13,14,15}

The incidence of diabetic foot is higher in patients with poor glycaemic control. Early detection of peripheral neuropathy and appropriate management of the same will reduce the incidence of amputations due to diabetic foot.

CONCLUSION

Peripheral neuropathy, which is one of the microvascular complications of diabetes mellitus can present even without symptoms. Active screening of peripheral neuropathy in all patients with diabetes mellitus is needed to reduce the morbidity associated with it.

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