



RESEARCH ARTICLE

**Screening of peripheral neuropathy among diabetic patients in urban health centre
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ABSTRACT

Background: The foot ulcers among diabetic patients are mostly neuropathic origin and therefore eminently preventable. Sensory neuropathy increases the risk of foot ulcerations by seven folds and peripheral arterial disease (PAD) by three folds in people with diabetes. The Prevalence of peripheral neuropathy among diabetes is 26-33%.

AIMS AND OBJECTIVES:

- 1) To find out magnitude of peripheral neuropathy among Type II diabetes mellitus patients.
- 2) To correlate frequency with selected socio demographic variables.

MATERIAL AND METHODS: Descriptive cross sectional study was done among 114 known Type II diabetic mellitus patients attending UHC under RMMC. Basic sociodemographic data were collected using a Pre-tested Questionnaire followed by a symptomatic history and Clinical Examination to rule out the peripheral neuropathy using monofilament 10G and tuning fork 128Hz. The peripheral neuropathy was tested objectively for various types of sensations like touch, pain, pressure, vibration, tactile localization and two point discrimination. Analysis was done using appropriate statistical methods.

RESULTS: Magnitude of Peripheral Neuropathy among 114 known Type 2 DM attending UHC is 28.9%. 74.5% were females, 67% were above the age of 50 years. 30% of patients complained of foot numbness and diminished sensation (22%). 28% of patients had loss of touch sensation and loss of vibrations (24%). Erectile dysfunction (5).

CONCLUSION: Community based study regarding prevalence of peripheral neuropathy could improve the reliability.

KEY WORDS: Diabetes, Peripheral Neuropathy, screening, sensory loss.

INTRODUCTION:

The prevalence of diabetes mellitus is growing rapidly worldwide and is reaching epidemic proportions¹. In 2013, according to International Diabetes Federation, an estimated 381 million people had diabetes.² Its incidence is increasing rapidly, and by 2030, this number is estimated to almost double.³ Diabetes mellitus occurs throughout the world, but is more common (especially type II) The increase in incidence in developing countries follows the trend of urbanization and lifestyle changes, perhaps most importantly a "Western-style" diet. This has suggested an environmental (i.e., dietary) effect, but there is little understanding of the mechanism(s) at present, though there is much speculation,³ Globally, as of 2010, an estimated 285 million people had diabetes. To global burden of diseases 2000, it was found to be 27.5 per 1,00,000 in India⁴.

A study done in urban Chennai showed that prevalence rate of diabetes as 14.3%⁵ and evidence of neuropathy among diabetes as 19.1%⁵ (Mohan et al 2000, 2006) The various forms of diabetic neuropathy include peripheral neuropathy, third nerve palsy, mononeuropathy, mononeuropathy multiplex, diabetic autonomic neuropathy and thoracoabdominal neuropathy. People with diabetes can, over time, develop nerve damage throughout the body. Some people with nerve damage have no symptoms. Others may have symptoms such as pain, tingling, or numbness—loss of feeling—in the hands, arms, feet, and legs. Nerve problems can occur in every organ system, including the digestive tract, heart, and sex organs. Age, duration of diabetes and poor glycemic control are recognized as risk factor for diabetic peripheral neuropathy, while cigarette smoking, retinopathy, hypertension, obesity,

hyperlipidemia and microalbuminuria has been pointed out as potential risk indicators.⁷

The foot ulcers among diabetic patients are mostly neuropathic origin and therefore eminently preventable. Sensory neuropathy increases the risk of foot ulcerations by seven folds and peripheral arterial disease (PAD) by three folds in people with diabetes⁸. Persons with diabetes mellitus, the annual population-based incidence of foot ulcer ranges from 1.0 to 4.1 percent and the prevalence ranges from 4 to 10 per cent, this suggests that the lifetime incidence may be as high as 25 per cent⁹. Upto 85% of the amputations among diabetic patients are preceded by foot ulcers⁷

Therefore the present study was undertaken to evaluate the discriminative power of the various screening techniques like Diabetic Neuropathy Examination (DNE) score, 10g Semmes Weinstein Monofilament Examination (SWMF) and Vibration Perception Threshold (VPT) in diabetic peripheral neuropathy (DPN) considering as gold standard. Hence, this hospital – based study was conducted to find out the frequency of peripheral neuropathy among type II diabetic individuals by using 10g Semmes Weinstein Monofilament Examination (SWMF) and Vibration Perception Threshold (VPT) and its association with selected socio demographic factors in the semi-urban community of Chidambaram, Tamil Nadu.

MATERIALS & METHODS:

Descriptive cross sectional study was done among 114 known Type II diabetes mellitus patients attending Urban Health Centre under RMMC for one week. Basic socio-demographic data were collected using a Pre-tested Questionnaire followed by a symptomatic history and Clinical Examination was done including their height and weight in light clothes. Body mass index was calculated using the formula weight in kilograms divided by height in

meter square. Evaluation of neuropathy was done clinically.

Clinical neuropathy was evaluated using a questionnaire on neuropathic symptoms and neuropathic symptom score(NSS) like presence of neuropathic pain or paresthesia. The calculation was done as present (1) or absent(0) .Neuropathic pain was defined as pain in the limbs in the absence of history of trauma or other external cause. Paresthesia was defined as a sensation which is characteristically perceived as numbness, distal burning and diminished sensation. The calculation of neuropathy disability score(NDS) presence of deep tendon reflexes and sensation are graded as normal(0),decreased(1) or absent(2).a score of 2 or more was taken as abnormal. Touch sensation was done using monofilament 10G and tuning fork 128HZ for vibration, perception threshold(VPT) on each malleolus, pain sensation by pin prick, position sense and deep tendon reflexes were also tested conventionally

Analysis was done using appropriate statistical methods.

RESULTS:

Out of 114 known case of type 2 diabetes comprised of 29(25.5%) males and 85(74.5%) females with the age group ranging from 30-75 years. Out of 114 patients 72 (50%) are hypertensive.BMI above 30(WHO criteria) was seen in (38%) of the diabetic patients .

Commonest neuropathic symptoms is foot numbness(30%) followed by distal burning sensation (26%) and diminished sensation (22%).28% of the patients had loss of touch sensation followed by loss of pain(25%) and vibration (24%).

According to the criteria for the diagnosis of peripheral neuropathy based on symptoms, signs and clinical examination, the study reveals that 28.9% are suffering from diabetic peripheral neuropathy.5 patients had erectile dysfunction followed by 2 had altered sweating

Table no: 1 demographic characteristics of sample (n=114)

VARIABLES	No (%)	%
AGE:		
30 - 40	14	12
41 - 50	24	21
51 - 60	38	34
61 - 70	30	27
71 - 80	08	6
TOTAL	114	100
SEX :		
MALE	29	25.5
FEMALE	85	74.5

EDUCATION:		
ILLITERATE	54	43
PRIMARY	25	21
MIDDLE	28	28
HSC	03	04
GRADUATE	04	04
PROFESSIONAL	0	0
OCCUPATION :		
UNEMPLOYED	34	46
HOME MAKER	29	25
COOLIE	20	17
AGRICULTURE	23	20
BUSSINESS	05	04
SALARIED JOB	03	02

34% of known diabetic patients belong to the age group of 51-60 years. Females (74.5%) are more compared to males(25.5%).it is observed that 43% of study subjects were illiterate.34% are not actively engaged in any occupation.

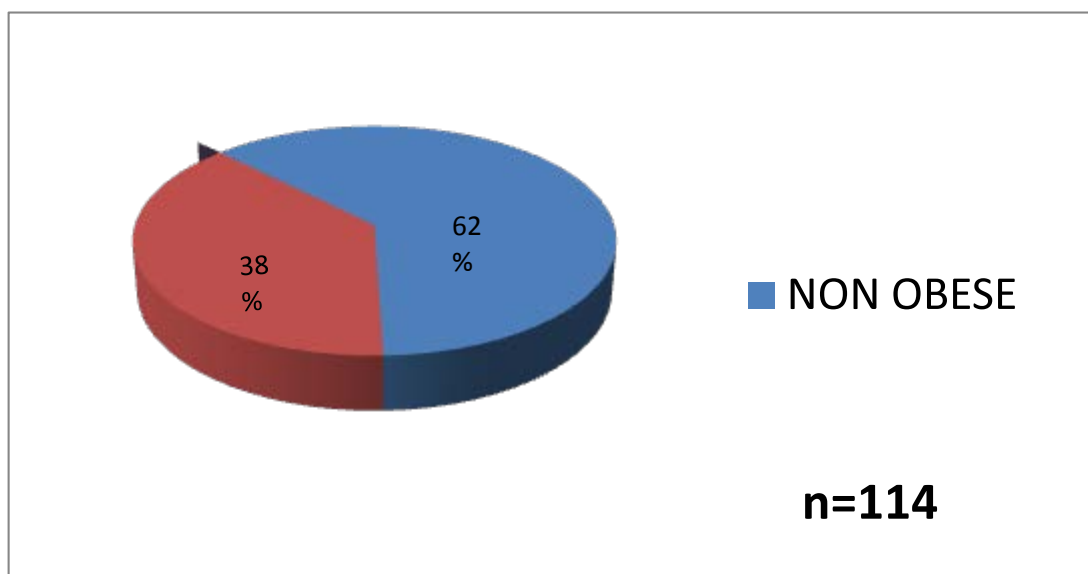


Figure 1: Distribution of BMI among diabetes

Table 2: Distribution of symptoms among diabetes

Symptoms	Present	%
Tremor	15	13
Diminished sensation	24	22
Pain over limbs	26	23
Foot numbness	29	30
Foot sores	25	22
Distal burning sensation	30	26

30% of study subjects reported foot numbness followed by 26% have reported distal burning sensation.

Table 3: Distribution of sensory signs

Signs	Absent	%
Touch	33	28
Deep pain	26	23
Pressure	28	25
Pain	28	25
Vibration	27	24
Tactile localization	28	25
Two point discrimination	25	25

Among 114 study subjects 28% subjects were found to have loss of touch sensation, 25% with absence of pain sensation

DISCUSSION:

Diabetic peripheral neuropathy is one of the commonest complication of diabetes mellitus and it may be first presenting symptom in type 2 diabetes. In current study 28.9% of the newly diagnosed patients of peripheral neuropathy. Evidence among type 2 diabetes mellitus. Which agrees with the finding of 27.8% by Franklin et al¹¹. Hamman et al¹² also found that prevalence of diabetic peripheral neuropathy in 29.7% and 26.9% in their study among non-Hispanic using vibration sensation Nielsen et al¹³ observed neuropathy in 38% of the patients.

However Ratzman et al¹⁴ and Pirart¹⁵ observes a lower prevalence of diabetic peripheral neuropathy in 6.3% and 7% respectively in their studies. Weerasuriya et al¹⁶ observed 9.8% of the diabetes had evidence of diabetic neuropathy at the time of diagnosis in their study from Sri Lanka. Ashok and his colleagues⁵ observed a prevalence of neuropathy in 5.4% of the patients with type 2 diabetes at the time of diagnosis. This difference in the prevalence of peripheral diabetic neuropathy between the study and current one can be explained because current study was done based on clinical symptoms and sign where else neuropathy was assessed by Ashok et al using a biothesiometer, which is comparatively a less sensitive method. Other factor may be because current patients attended the urban health centre much later compared to patients of Ashok et al⁵ because of less awareness of the disease.

CONCLUSION AND RECOMMENDATION:

The prevalence of peripheral Neuropathy among patients with diabetes in current study was high in older age, longer the duration of diabetes and obese. Older adult patients should be screened for peripheral neuropathy continuously using simple instruments like monofilament and tuning fork because Neuropathy develops gradually. The initial measures to prevent peripheral Neuropathy includes glycemic control and body weight control.

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