



Study of Prevalance of Small Fibre Neuropathy among Diabetic Population in DAE Hospital using Diabetic Foot Care Test

Author

Dr Sridevi Sitaraman MD (Internal Medicine)

Physician Department of Atomic Energy Hospital

Introduction

Diabetic neuropathy is defined as signs and symptoms of peripheral nerve dysfunction in whom other causes of neuropathy are excluded. DM is frequently complicated by neuropathy affecting about 50 percent of diabetic population. It leads to 2 important consequences which is foot ulceration and neuropathic pain. The prevalence in India is between 10.8 percent-32.2 percent. Early detection of neuropathy is important to reduce the complications. The longer the duration of diabetes and poor glycemic control increases the risk. Painful sensory neuropathy (Small Fibre Neuropathy) is a major burden in diabetic population which complicates the situation. Small diameter nerve fibres are the earliest fibres damaged in diabetes. Highly processed foods with added sugars, dairy gluten and alcohol are confounding factors in neuropathy. Impaired glucose tolerance exhibited a lower mean nerve conduction velocity. Symptoms of muscle weakness sensation and autonomic neuropathy were found in DM. So the sensations of pinprick, vibration, temperature sensation, autonomic neuropathy test, Doppler and podia scan are done using diabetic foot care

testing device which helps to pick up neuropathy at an earlier stage. Treatment would mainly focus on controlling the risk factors so early diagnosis of the same is necessary and strict control of DM is important. As its mostly linked with metabolic syndrome risk factors contributing to the syndrome is addressed for control of neuropathy. So annual screening of neuropathy in diabetic population will help in early diagnosis of the same and initiation of treatment

Study Methodology

This is a retrospective study done in our Institution from March 2024 - January 2025 of 100 patients after obtaining ethical clearance and informed consent from all patients who had symptoms of numbness, pricking sensation, burning sensation in feet with DM on medications

Risk Factors

Factors taken into consideration for the study included age, sex, duration of diabetes mellitus (DM), dyslipidemia, smoking, and family history of metabolic syndrome. Neuropathy testing was done using diabetic foot care testing device which tests the vasculopathy, neuropathy (peripheral,

autonomic) and podiatric scan and results were evaluated as negative, positive {high probability for foot ulcers}

Inclusion Criteria- In this study, we included male and female patients who had symptoms of numbness of feet, burning pricking sensation of feet, giddiness with DM on medications

Exclusion Criteria- Patients already having other causes of neuropathy like B12 deficiency, alcohol induced, autoimmune conditions like RA,intake of chemotherapy drugs, conditions like leprosy and very old debilitated patients were excluded

Results

In our study we included 100 DM patients with symptoms and studied for the prevalence of small fibre neuropathy. We found that 48 patients were male and rest 52 were female (table 1).65 pts had numbness of feet as the predominant symptom

and 19 had burning pricking sensation of feet and 16 had giddiness (table 3). It was found that younger patients were more prone to neuropathy as 51of them were less than 60 yrs and rest 49 were greater than 60 yrs (table2). It was also found that risk factor predominance was associated with neuropathy as 54 patients had risk factors like hypertension dyslipidemia with positive family history 31 patients had only positive family history and no risk factors and 15 had only DM and no risk factors (table5).Regarding prevalence of small fibre neuropathy it was found that all patients with positive risk factors and family history had positive results for vasculopathy and neuropathy (54 patients) and 31 patients had defective neuropathy and podia scan and 15 patients had autonomic and small fibre neuropathy and defective podia scan (table4)

Table 1: Prevalence of Small Fibre Neuropathy according to sex

Sex	Presence of neuropathy	Vasculopathy	Defective Podia scan
Female	46	3	3
Male	38	4	6

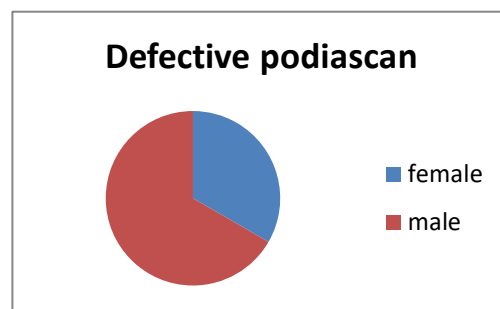
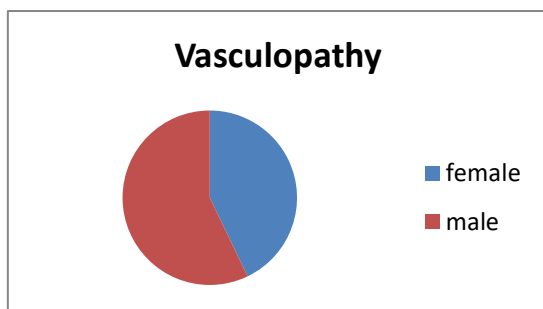
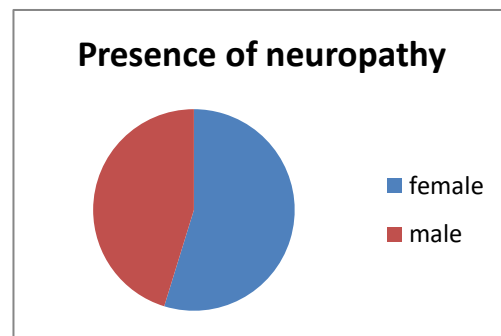
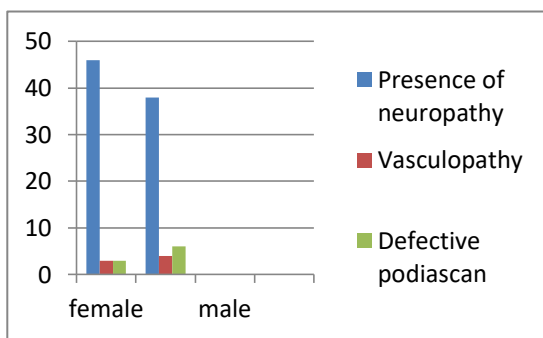


Table 2: Overall prevalence according to age

Age	Neuropathy present	Neuropathy absent
<60 years	46	5
>60 years	43	6

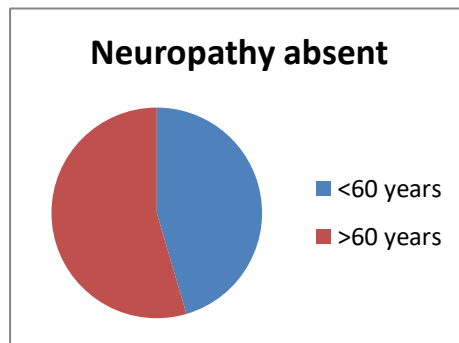
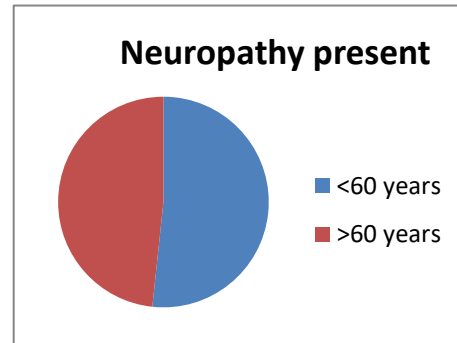
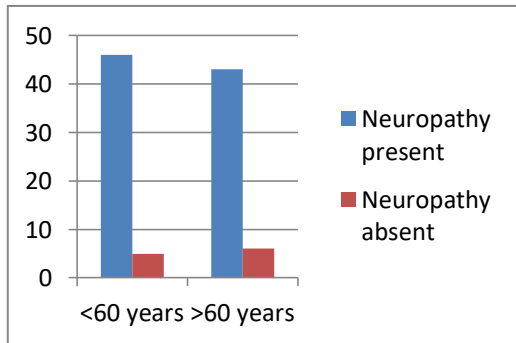


Table 3 Prevalence of different symptoms in pts

Numbness of feet	Burning pricking sensation of feet	Giddiness
65	19	16

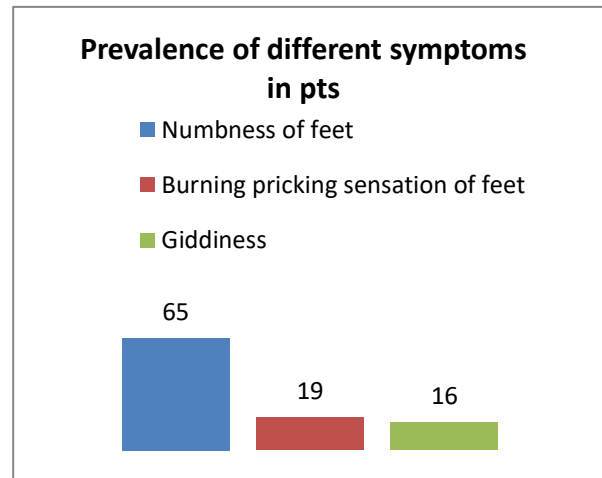
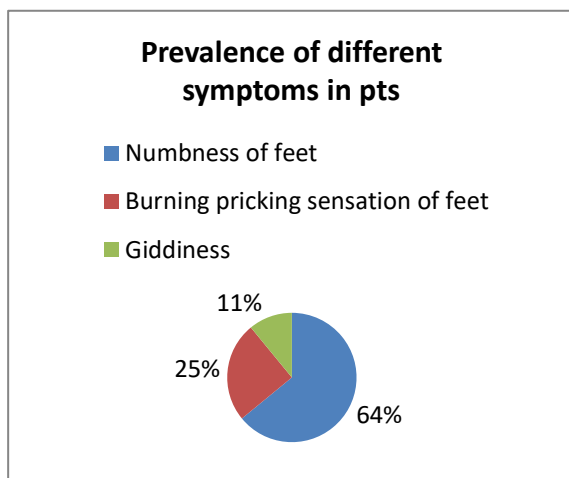


Table 4: Prevalence of different components using diabetic foot care device in DM pts with risk factors and positive family history

Patients with DM	Patients with risk factors and family history	Family history
Neuropathy present	40	6
Vasculopathy present	4	4
Defective podiascan	40	6

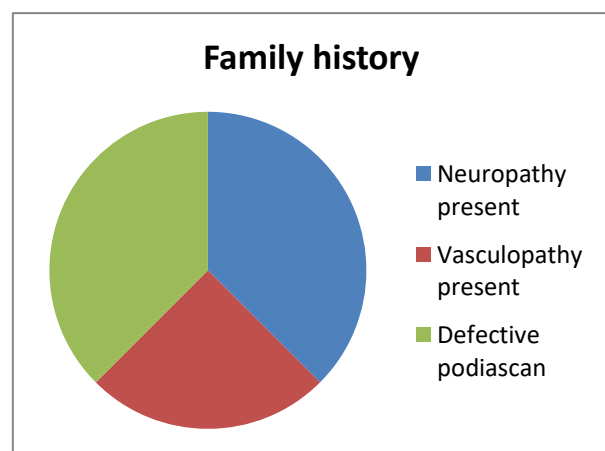
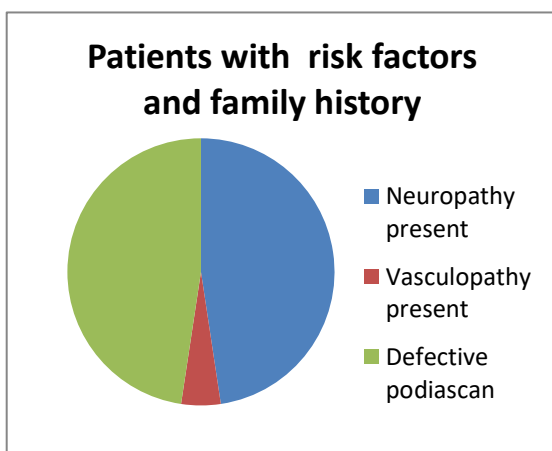
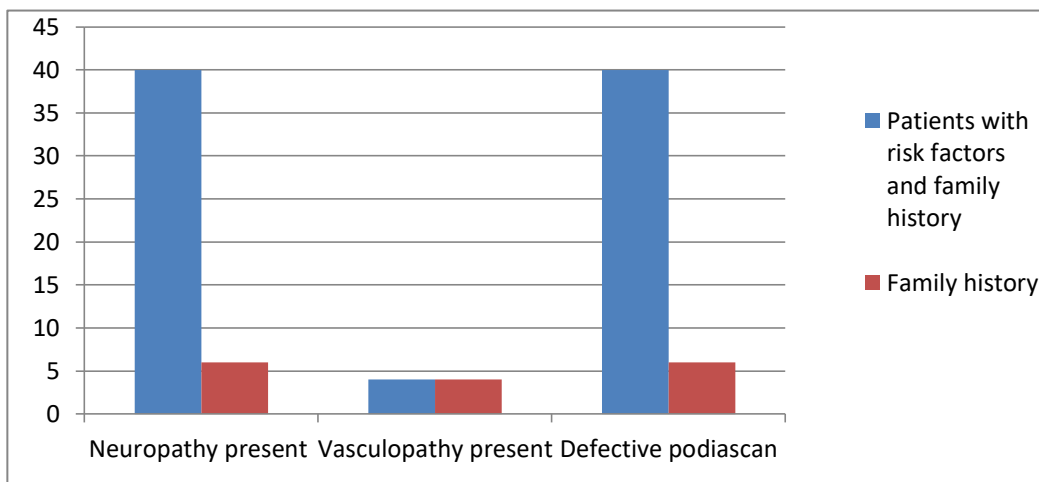
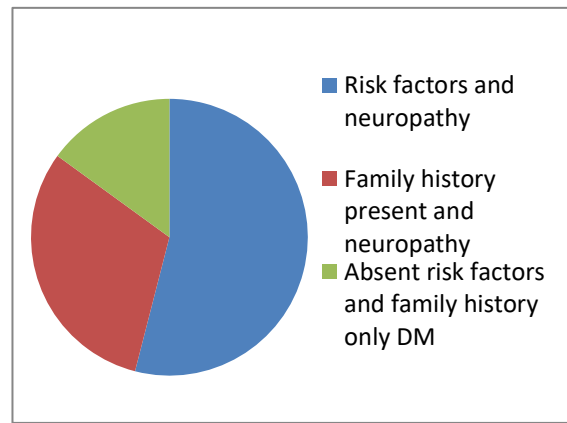
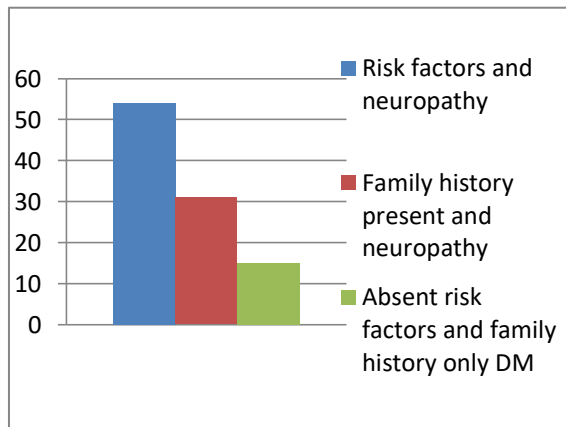


Table 5 Prevalence of neuropathy based on risk factors and family history

Risk factors and neuropathy	Family history present and neuropathy	Absent risk factors and family history only DM
54	31	15



Comparison with National trend

There was a striking preponderance for the development of painful DPN in female participants, providing the strongest evidence so far for female sex being a major risk factor for painful DPN which is in line with the national study [table 1]. The risk factors for incident DPN included duration of diabetes, elevated HbA_{1c}, obesity, smoking, elevated triglycerides, family history and hypertension. Chronic painful DPN can be extremely distressing and is a leading cause of morbidity and healthcare utilisation. Furthermore, its patho physiology remains undetermined and current treatments provide sub-optimal pain relief. Peripheral neuropathies commonly affect older people. Peripheral neuropathy can be caused by axonal damage or demyelination, as well as damage to large or small fibers. In India, 28% of adults aged 70–79 years and 35% of adults aged ≥80 years had peripheral neuropathy based on a simple screen which is not in line with our study as our study shows a younger age group prevalence. This shows the dangerous situation that younger age group are also developing complications in present scenerio. The prevalence of numbness of feet is greater than pricking burning sensation of feet which is greater than giddiness and imbalance which is in line with our study(table 3).The prevalence of symptoms of neuropathy is more predominant in people with risk factors and family history which is line with our study (table 5)

Comparison with International trend

The international study also states that the prevalence of painful small fibre neuropathy was more with females than males and the presence of risk factors and family history complicates the situation and leads to morbidity and mortality which is in line with our study. The age of prevalence is more in >80 years of age, but our study has younger age group prevalence. Also among the components checked neuropathy predominates than vasculopathy and defective podiascan which is in line with our study

Limitations

Many people like fragile patients, arthritis patients, people with neuropathy caused by drugs, b12 deficiency with DM were excluded and so the diafoot care testing device testing was used as a tool of functional assessment, while other tests like nerve conduction, impedance studies has to be carried out for confirmation and management

Conclusion

Our study supports the fact that In patients with symptoms like symptoms of numbness of feet, burning pricking sensation of feet and imbalance of gait with positive small fibre neuropathy component is a suspicion of neuropathy which provides an important diagnostic tool for diagnosis and management of peripheral diabetic neuropathy. DIAFOOT CARE testing device is a good test for functional assessment of patients,

also an important aid in management of small fibre painful diabetic neuropathy at an earlier stage

Implications for the Community

Our study of prevalence of diabetic neuropathy in DM patients using diafoot care device in alignment with national and international study data has proved that DIAFOOT care testing device is a reliable and sensitive tool which is noninvasive to detect neuropathy and it properly guides us with management at the earliest without any delay

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