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Original Article

Analysis of incidence of peripheral neuropathy in patients with Diabetes Mellitus Type 2

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ABSTRACT:

Background: To analyse the incidence of peripheral neuropathy in patients with Diabetes Mellitus Type 2. **Materials & methods:** 100 subjects were enrolled. Neuropathy disability score was used for assessing the prevalence of peripheral neuropathy among diabetic patients. Neuropathic deficits in the feet were determined using the NDS (neuropathy disability score). Incidence of peripheral neuropathy was recorded. **Results:** A total of 100 diabetic subjects were enrolled. Neuropathy disability score was used for assessing the prevalence of peripheral neuropathy among diabetic patients. The diagnosis of type 2 diabetes was done according to the criteria laid down by American Diabetic Association. Neuropathic deficits in the feet were determined using the NDS (neuropathy disability score). All the results were analyzed by SPSS software. **Conclusion:** Diabetic peripheral neuropathy is a complication of diabetes associated with high degree of morbidity. Longer theduration of diabetes, higher is the risk of occurrence of peripheral neuropathy.

Key words: Peripheral neuropathy, Diabetes

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INTRODUCTION

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels.[1-3]

The signs and symptoms of diabetes are disregarded by many because of the chronic progression of the disease. People do not consider this as a serious problem because unlike many other diseases the consequences of hyperglycaemia are not manifested immediately. People are not aware that damage can start several years before symptoms become noticeable. This is unfortunate because recognition of early symptoms can help to get the disease under control immediately and to prevent vascular complications.[4-6]Hence; the present study was undertaken for evaluating the incidence of peripheral neuropathy in patients.

MATERIALS & METHODS

The present study was undertaken for evaluating the incidence of peripheral neuropathy in patients. A total of 100 diabetic subjects were enrolled. Neuropathy disability score was used for assessing the prevalence of peripheral neuropathy among diabetic patients. The diagnosis of type 2 diabetes was done according to the criteria laid down by American Diabetic Association. Neuropathic deficits in the feet were determined using the NDS (neuropathy disability score). All the results were analyzed by SPSS software.

RESULTS

57.3 years was the mean age of the patients while 11.2 years was the mean duration of the diabetes. Overall incidence of diabetic neuropathy was 18 percent. Mean duration of diabetes among patients with and without diabetic neuropathy was 15.3 years and 8.3 years respectively. Significantly higher incidence of diabetic neuropathy was seen in patients with longer duration of diabetes.

Table 1: Mean age and SD of the patients of the present study

Age (years)	Number
Mean	57.3
±SD	6.8

Table 2: Distribution of subjects according gender

Gender	Frequency	Percentage
Males	71	71
Females	29	29
Total	100	100

Table 3: Distribution of subjects according duration of diabetes

Duration of diabetes	Frequency	Percentage
Less than 5 years	12	12
5 to 10 years	43	43
Greater than 10 years	45	45
Total	100	100

Table 4: Incidence of diabetic neuropathy

Diabetic neuropathy	Frequency	Percentage
Present	18	18
Absent	82	82
Total	100	100

DISCUSSION

Several pathogenic processes are involved in the development of diabetes. These range from autoimmune destruction of the β-cells of the pancreas with consequent insulin deficiency to abnormalities that result in resistance to insulin action. The basis of the abnormalities in carbohydrate, fat, and protein metabolism in diabetes is deficient action of insulin on target tissues. Deficient insulin action results from inadequate insulin secretion and/or diminished tissue responses to insulin at one or more points in the complex pathways of hormone action. Impairment of insulin secretion and defects in insulin action frequently coexist in the same patient, and it is often unclear which abnormality, if either alone, is the primary cause of the hyperglycemia.[6- 10]Hence; the present study was undertaken for evaluating the incidence of peripheral neuropathy in patients.

57.3 years was the mean age of the patients while 11.2 years was the mean duration of the diabetes. Overall incidence of diabetic neuropathy was 18 percent. Mean duration of diabetes among patients with and without diabetic neuropathy was 15.3 years and 8.3 years respectively. Diabetic neuropathy (DN) is a common disorder and is defined as signs and symptoms of peripheral nerve dysfunction in a patient with diabetes mellitus (DM) in whom other causes of peripheral nerve dysfunction have been excluded. There is a higher prevalence of DM in India (4.3%) compared with the West (1%–2%). Probably Asian Indians are more prone for insulin resistance and cardiovascular mortality. The incidence of DN in India is not well known but in a study from South India 19.1% type II diabetic patients had peripheral neuropathy. DN is one of the commonest causes of peripheral neuropathy.[11- 14]Neuropathic pain is one of the major disabling symptoms of patients with DSP. It is a difficult condition to treat and therefore causes significant patient suffering and societal burden. It is estimated that diabetic neuropathic pain (DNP) develops in 10% to 20% of the diabetic population overall, and can be found in 40% to 60% with documented neuropathy. However, these numbers are likely to be underestimates, as one study showed that approximately 12% of patients with DNP had never mentioned this condition to their doctors. Like other types of neuropathic pain, DNP is characterized by burning, electric, and stabbing sensations with or without numbness. Frequently, patients develop allodynia (painful sensations to innocuous stimuli) and hyperalgesia (increased sensitivity to painful stimuli). However, less than half are treated for pain, despite many available effective therapies. Fortunately, there are multiple neuropathic pain screening instruments available to aid the clinician in identifying those who would benefit from treatment.[15-18]

In the present study, significantly higher incidence of diabetic neuropathy was seen in patients with longer duration of diabetes.Abbott CA et al assessed in the general diabetic population, the prevalence of painful neuropathic symptoms. Prevalence of painful symptoms (NSS ≥5) and PDN (NSS ≥5 and NDS ≥3) was 34 and 21%, respectively. Painful symptoms occurred in 26% of patients without neuropathy (NDS ≤2) and 60% of patients with severe neuropathy (NDS >8). Adjusted risk of painful neuropathic symptoms in type 2 diabetes was double that of type 1 diabetes (odds ratio [OR] = 2.1 [95% CI 1.7–2.4], P < 0.001) and not affected by severity of neuropathy, insulin

use, foot deformities, smoking, or alcohol. Women had 50% increased adjusted risk of painful symptoms compared with men. Despite less neuropathy in South Asians (14%) than Europeans (22%) and African Caribbeans (21%) ($P < 0.0001$), painful symptoms were greater in South Asians. One-third of all community-based diabetic patients have painful neuropathy symptoms, regardless of their neuropathic deficit.[19]

CONCLUSION

Diabetic peripheral neuropathy is a complication of diabetes associated with high degree of morbidity. Longer theduration of diabetes, higher is the risk of occurrence of peripheral neuropathy.

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