

Original Article

Frequency of Autonomic Neuropathy in Type-1 Diabetes Mellitus Patients

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Abstract

Objectives: To determine the frequency of diabetic autonomic neuropathy in type 1 diabetes mellitus.

Methodology: This cross-sectional study was conducted at Medical Unit-IV, Services Institute of Medical Sciences, Lahore. A total of 236 cases fulfilling the inclusion/exclusion criteria were enrolled from Medical OPD Services Institute of Medical Science, Lahore. An informed consent of the patients was taken to include their data in the study. Detailed history for Diabetes Mellitus was taken. All the patients were undergoing for evaluation of diabetic autonomic neuropathy. Presence/absence of DAN was recorded. All this information was recorded.

Results: In our study, frequency of diabetic autonomic neuropathy in type 1 diabetes mellitus was recorded in 17.80%(n=42) whereas 82.20%(n=194) had no findings of the morbidity.

Conclusion: We conclude that the frequency of diabetic autonomic neuropathy in type 1 diabetes mellitus is not very high, but it varies according to diagnostic criteria and population, however, some-other studies in different health centers of our country is required.

Keywords: Type 1 Diabetes Mellitus, Diabetic autonomic neuropathy

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Introduction

Peripheral neuropathy is the most recurrent and incapacitating outcome of diabetes mellitus. About half of all diabetic patients are afflicted with some form of neural damage making this the most prevalent complication encountered in diabetes.^{1,2}

The underlying mechanism of this nerve damage is consistently raised serum glucose levels which adversely affects the quality of life of diabetic patients.^{3,4}

There still remains lack of definitive therapy to halt the progress of neuropathy after it sets in. It can be prevented by exercising glycemic and blood

pressure control and amendments in lifestyle by quitting cigarettes, losing weight and incorporating daily exercise.⁵

The study was conducted with the view that there is lack of local data available to assess the extent of prevalence of diabetic neuropathy while the international studies indicate a wide range of its prevalence ranging from 66 to 90 percent.^{6,7} In our targeted population, a majority of patients remain undiagnosed for diabetic autonomic neuropathy and early diagnosis and management can aid in improved quality of life for diabetic patients in our setup.

Methodology

The study was conducted in Medical Unit-IV, Services Institute of Medical Sciences, Lahore. A total of 236 diagnosed cases of diabetes mellitus type I, with a disease duration of more than 5 years, aged between 20-40 years of either gender were included in the study. Exclusion criteria was presence of ischemic heart disease, malignancy, strokes and those on vasodilator and sympatholytic medication. All the patients were evaluated for presence of diabetic autonomic neuropathy by a trained physician. The data was entered and analyzed in SPSS version for 21.0.

Results

Age distribution of the patients shows that 74.15% (n=175) were between 20-30 years of age whereas 25.85% (n=61) were between 31-40 years of age (Table 1). There were 52.97%(n=125) males while

Table 1: Grouping of Diabetic Patients on the Basis of Age (n=236)

Age(in years)	No. of patients	%
20-30	175	74.15
31-40	61	25.85
Total	236	100
Mean±SD	2.14±0.67	

Table 2: Grouping of Diabetic Patients on the Basis of Gender (n=236)

Gender	No. of patients	%
Male	125	52.97
Female	111	47.03
Total	236	100

Table 3: Mean Duration of Disease in Diabetic patients (n=236)

Duration of disease	Mean	SD
	2.13	0.67

Table 4: Frequency of Diabetic Neuropathy in Type 1 Diabetes Mellitus (n=236)

Diabetic Autonomic Neuropathy	No. of patients	%
Yes	42	17.80
No	194	82.20
Total	236	100

47.03% (n=111) were females. (Table 2) Mean duration of disease was calculated as 2.13+0.67 years. (Table No. 3). Frequency of diabetic autonomic neuropathy in type 1 diabetes mellitus was recorded in 17.80% patients (n=42) (Table No. 4)

Discussion

In our study, out of 236 cases, frequency of diabetic autonomic neuropathy (DAN) in type 1 diabetes mellitus (T1DM) was recorded in 17.80%(n=42) whereas 82.20%(n=194) had no findings of the morbidity. We compared our results with a previous study by Bavoe recorded that DAN was found in 133/200 (66%) of the subjects.⁶ Another study revealed a variable prevalence of DAN. and reported 1 to 90 percent among patients of T1DM.⁷ On the contrary, in a community based. population study, the prevalence of DAN was found to be 16.7%.^{8,9}

It is dependent upon the criteria being used for the diagnosis and the target population to classify those who are suffering from DAN and those who are not. Another study conducted in Rochester, Minnesota revealed 5.5% prevalence of symptomatic visceral autonomic neuropathy among diabetic patients.¹⁰ Increased evidence of abnormal tests of autonomic

nervous system function and symptoms of autonomic dysfunction among diabetics mandates early detection of this complication.

The cardiovascular system, besides nervous system is also affected by autonomic neuropathy in DM and can lead to painless myocardial infarction and sudden deaths, as also proven by one of the many similar studies in which 43% of the subjects presented with cardiovascular affects.¹⁰⁻¹⁵ In another research involving 22 diabetic centers from Switzerland, Germany and Austria with 1171 diabetics, 25.3% of T1DM and 34.3% of type 2 diabetes mellitus (T2DM) patients suffered from cardiovascular autonomic neuropathy.⁸ Similarly, cardiac autonomic dysfunction was evident in 48% of T1DM patients and 76% of T2DM patients in a Pakistani study as well.¹⁶ Abnormal autonomic reflex was seen in 24 out of 33 patients in another research too. Postural hypotension, abnormal Valsalva maneuver and orthostatic hypotension were also seen among 21.2%, 15.2% and 9% patients respectively.¹⁴

DAN is usually missed at early stages; hence it progresses and can be detrimental to the patients' life later. However, DAN can be identified even in the asymptomatic patients with the use of cardiovascular autonomic tests. Tightly controlled blood glucose levels and healthy ways of living remain the only worthwhile approach which can not only prevent but also dampen the advancement of this adverse outcome.

Conclusion

We conclude that the frequency of diabetic autonomic neuropathy in type 1 diabetes mellitus is not very high but it varies according to diagnostic criteria and population, however, some other studies in different health centers of our country is required.

Conflict of Interest *None*

Funding Source *None*

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Authors Contribution

N.Z.: Conceptualization of project

N.A.: Statistical analysis

U.A.: Drafting revision

M.K.B.: Writing of manuscript

Z.K.: Literature search

H.A.: Data collection