ORIGINAL RESEARCH

Determination of diabetic peripheral neuropathy in patients with type II diabetes mellitus

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ABSTRACT
Background: With the global trend toward increased prevalence, diabetes mellitus (DM) is a catastrophic metabolic condition that has a financial impact on every nation in the globe. The present study was conducted to evaluate cases of diabetic peripheral neuropathy in adult patients. **Materials & Methods:** 125 type II diabetes patients of both genders were selectd. All patients underwent assessment of fasting blood sugar, random blood sugar and glycosylated hemoglobin was done. Assessment of diabetic polyneuropathy was done. **Results:** Out of 125 patients, males were 70 and females were 55. Out of 70 male patients, 40 had diabetic peripheral neuropathy and out of 55 females, 24 had diabetic peripheral neuropathy. There were 22 cases of DPN with 5 years, 38 cases with 5-10 years and 65 cases with >10 years of diabetes. Symptoms were numbness of limbs in 72 and ulcerations in 53 cases. The difference was significant (P<0.05). **Conclusion:**
Key words: blood sugar, Diabetes, diabetic peripheral neuropathy

INTRODUCTION

With the global trend toward increased prevalence, diabetes mellitus (DM) is a catastrophic metabolic condition that has a financial impact on every nation in the globe. Insulin resistance—with or without an insulin shortage that results in organ dysfunction—is a hallmark of type 2 diabetes.[1] Reactive oxygen species (ROS) and nitrosative species (RNS) are produced when diabetes mellitus (DM) persists, and both are thought to be critical for issues with the macro- and microvessels of the disease. Insulin resistance, endothelial dysfunction, and problems from diabetes mellitus are known to be brought on by a decrease in the activity of antioxidant enzymes in addition to an excess of ROS and RNS.[2] Moreover, diabetes mellitus (DM) is a significant worldwide health concern. Nonetheless, additional variables contribute to the development of neuropathy, such as modifiable cardiovascular risk factors like smoking, dyslipidemia, and hypertension; as a result, public health.[3]

It is clear that oxidative stress activates uncoupling protein 2 (UCP-2), which lowers the adenosine triphosphate (ATP)/adenosine diphosphate (ADP) ratio and, ultimately, the insulin secretory response, hence inhibiting insulin production in pancreatic β-cells. This method describes the pathophysiology of diabetes mellitus and the pancreatic dysfunction brought on by glucose toxicity.[4] Due to its high risk of falls, chronic pain, foot ulcers, and limb amputation, DPN is one of the top causes of disability globally and has a negative impact on quality of life. Moreover, anxiety, melancholy, and sleep disturbances are frequently brought on by DPN symptoms. The shared underlying pathophysiology of microangiopathy and hyperglycemia is inadequate glycemic control.[5] The present study was conducted to evaluate cases of diabetic peripheral neuropathy in adult patients.

MATERIALS & METHODS

The present study comprised of 125 type II diabetes patients of both genders. All were informed regarding the study and written consent was obtained.

Data such as name, age, gender etc. was recorded. Following a comprehensive clinical examination, measurements of glycosylated hemoglobin, random

blood sugar, and fasting blood sugar were made. Physical symptoms such ulcerations, numbness, and loss of reflexes were noted. Diabetic polyneuropathy was evaluated. Results were tabulated and subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total - 125		
Gender	**Male**	**Female**
Number	70	55

Table I shows that out of 125 patients, males were 70 and females were 55.

Table II Assessment of prevalence of diabetic peripheral neuropathy

Total	Male	Female
125	40	24

Table II shows that out of 70 male patients, 40 had diabetic peripheral neuropathy and out of 55 females, 24 had diabetic peripheral neuropathy.

Table III Assessment of parameters

Parameters	Variables	Number	P value
Duration of Diabetes (Years)	5	22	0.04
	5-10	38	
	>10	65	
Symptoms	Numbness	72	0.01
	Ulcerations	53	

Table III shows that there were 22cases of DPN with 5 years, 38 cases with 5-10 years and 65 cases with >10 years of diabetes. Symptoms were numbness of limbs in 72 and ulcerations in 53 cases. The difference was significant (P<0.05).

DISCUSSION

Globally, diabetes mellitus (DM) has become an epidemic. In the past, diabetes was thought to be a condition exclusive to wealthy individuals and industrialized nations.[6] On the other hand, new data indicates that diabetes is becoming more commonplace worldwide, especially in developing nations. In the South Asian region, diabetes mellitus has emerged as a significant health concern, with an anticipated 151% increase in diabetes prevalence between 2000 and 2030.[7] Despite the significance of DPN, there is a deficiency in efficient screening techniques, leading to a delay in DPN diagnosis and, consequently, inconsistent epidemiological estimates amongst areas. The growing body of evidence linking hyper-triglyceridemia to the onset and progression of diabetic neuropathy is reinforced by the correlation between high fasting triglycerides and DPN. High serum triglycerides are frequently linked to insulin resistance and are an important clinical indicator of the metabolic syndrome.[8] The atherogenic potential that results from this association may accelerate the development of DPN. Well-established risk factors for DPN include getting older, having diabetes for a longer period of time, and having poor glycaemic control. Other possible risk markers include retinopathy, hypertension, obesity, hyperlipidemia, smoking, and microalbuminuria.[9,10] The present study was conducted to evaluate cases of diabetic peripheral neuropathy in adult patients.

We found that out of 125 patients, males were 70 and females were 55. Out of 70 male patients, 40 had diabetic peripheral neuropathy and out of 55 females, 24 had diabetic peripheral neuropathy. 528 diabetic patients with a mean age of 55.0 ± 12.4 years were included in Katulanda et al's study.[11] Of these patients, 18.0% were from urban regions and 37.3% were male. According to the DNS score, the prevalence of DPN was 48.1%, 59.1%, and 28.8% among all patients, patients with diabetes who had already been diagnosed, and newly diagnosed patients. According to the TCSS, 24% of people with established DM had DPN, with mild DPN making up the majority (16.6%). Subjects with established DM form the basis for the remaining portion of the abstract. DPN was present in 20.0% of males and 26.4% of females, respectively. The mean age of individuals with DPN was 62.1 ± 10.8 years, while that of those without DPN was 55.1 ± 10.8 years ($p < 0.001$). The presence of foot ulcers, female gender and smoking were the strongest predictors followed by insulin treatment, diabetic retinopathy, treatment with sulphonylureas, increasing height, rural residence, higher levels of triglycerides and longer duration of DM.

We observed that there were 22 cases of DPN with 5 years, 38 cases with 5-10 years and 65 cases with >10 years of diabetes. Symptoms were numbness of limbs in 72 and ulcerations in 53 cases. According to Younger et al[12], 33% of cases with neuropathy were classified as severe, 50% as moderate, and 17% as light. It was determined that one third of nerves had primary myelinopathy and two thirds had primary axonopathy. In all, MV and PV were found in 3% and

23% of nerves, respectively. In two-thirds of nerves, immunofluorescence revealed C3 and C5b-9 membrane assault complex deposits in the walls of endoneurial microvessels. Necrotizing arteritis was seen in nerve biopsy samples from two DSPN patients and one DLRPN patient. However, it was not present in the postmortem samples from the latter patient, in which PV of the epineurium, perineurium, and endoneurium was seen in the lumbar plexus, sciatic nerve, and femoral nerve. Previous research has shown that patients with a lower socioeconomic class had worse metabolic management of their diabetes. The correlation between DPN and increased height suggests that peripheral nerve function is negatively impacted by higher stature generally. Taller individuals have longer nerves, which are linked to larger axon surface areas. Therefore, when exposed to otherwise equal dangers, those with longer nerves (and so a larger total axon surface area) may be more susceptible to neurologic damage.

CONCLUSION

Authors found that results showed that compared to females, males experienced a higher prevalence of diabetic peripheral neuropathy. Diabetes duration was a risk factor.

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