

ORIGINAL ARTICLE

Peripheral Neuropathy in Newly Diagnosed Cases of Type II Diabetes Mellitus

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ABSTRACT

Objective: Diabetes mellitus linked to severe macrovascular and the microvascular complications. Diabetic peripheral neuropathy is the challenging complication of the diabetes mellitus, which is linked to the morbidity, mortality, and big economic burden. We determined the frequency of peripheral neuropathy in newly diagnosed cases of type II diabetes mellitus.

Materials & Methods: The current descriptive Cross Sectional study took place in Services Institute of Medical Sciences, Lahore, From June 2014 to January 2015. All the patients, those were newly diagnosed with diabetes mellitus, aged 30-60 years and both genders were included. Detailed history regarding diabetes was taken. Patients underwent for the evaluation of peripheral neuropathy by taking physical examination, previous history and vibration perception test. All the data was recorded in the Proforma.

Results: Total 150 cases were studied, out of them, 42.67% were aged 30-45 years while 57.33% were in the age range of 46-60 years and their overall mean age was 46.35 ± 9.52 years. Males were 54.0% and females were 46.0%. Frequency of peripheral neuropathy for newly diagnosed type II diabetic subjects was noted 20.67%, with insignificant association of age and gender.

Conclusion: It was concluded that the peripheral neuropathy was 20.67% among patients newly diagnosed with diabetes mellitus.

Key Words: Newly diagnosed type II diabetic patients, Peripheral neuropathy.

INTRODUCTION

Diabetes Mellitus (DM) is a medical condition with Hyperglycemia and metabolic disorder. It is a highly frequent endocrine condition and a major health problem. Above 0.22 billion people globally are diabetic.¹ Pakistan alone presently accounts for 6,200,000 diabetic cases and it is estimated that by until 2025. This figure will be nearly two times the current figure reaching 11.6 million individuals,² and > 87 thousands occurred in Pakistan due to diabetes.³ Neuropathy remains a most common complication for diabetes, distressing around 50% individual with diabetes.⁴ Neuropathy is a key factor of elevated mortality and morbidity, and is correlated with time

period of hyperlipidemia, diabetes, and poor management of diabetes.⁵ It is more frequent among cases of prolonged diabetes duration and poor glycemic control and its progress may be cause of lower extremity amputation.⁶ Several metabolic irregularities as advanced glycosylation accumulation end products/sorbitol, raised oxidative stress along with nerve ischemia and weak repair mechanisms may be cause of the neuropathy development.^{6,7}

The term diabetic neuropathy is expressed as signs and symptoms of impaired nerve functions in diabetic subjects following the exclusion of other causes. This complication remains frequent and can possibly lead to limb amputation, foot ulceration, joint deformity and

muscle atrophy.⁸ Previous studies are of the view that yet in freshly diagnosed subjects with type 2 diabetes (T2DM) with poor management of diabetes, frequency of micro-vascular complications is much greater than those with average management of diabetes. Thus, strong management of diabetes is helpful, even in freshly diagnosed T2DM to avoid and minimize the incidence of complications.⁹

A recent study recorded 16.8% cases of the newly diagnosed type II diabetes mellitus with peripheral neuropathy.¹ Another study recorded these findings in 29% of the cases.¹⁰ The rationale of this study is that, no data is available in our local population to address this issue. The results of the current study will clarify the above variation in our targeted population and also record the exact frequency, it will be helpful for the newly diagnosed type II diabetics and physicians as well for early administration of the morbidity.

MATERIALS AND METHODS

Study Design

This descriptive cross Sectional study was carried out in the Services Institute of Medical Sciences, Lahore, From June 2014 to January 2015.

Data Collection

Sample size of 150 subjects was calculated with a 6% margin of error, 95% confidence level and taking expected %age of peripheral neuropathy i.e. 16.8%¹ in newly diagnosed type II diabetics. Well-versed consent was taken from every subject. Detailed medical history and clinical examination were done. All patients underwent the evaluation process of peripheral neuropathy. Peripheral neuropathy was defined as the condition of impaired or diseased nerves that convey messages to the spinal cord and brain from the other body organs and vice versa. Diabetes mellitus was defined as those cases diagnosed as diabetic in previous 6 months and having a FPG level > 126 mg/dl. All the data in addition to presence/absence of peripheral neuropathy was recorded by the researcher on a pre-designed Performa.

Inclusion Criteria

All newly diagnosed cases of diabetes mellitus from last 6 months, aged 30-60 years and both genders were included.

Exclusion Criteria

All those subjects with neuropathy because of other factors, i.e. hereditary, drugs, autoimmune (acute/chronic, relapsing polyneuropathy) and subjects with systemic disorders such as chronic kidney dysfunction, Vitamin-B12 deficiency, hypothyroidism, hepatic disease, (AST/ALT > 40IU) vasculitis, malignancy, or leprosy (on the medical record and history) and not willing to participate in this study were excluded.

Data Analysis

The data analysis was carried out by SPSS version 16.0. Mean ± SD were computed for quantitative variable such as age, FPG. Frequencies and percentages calculation were done for qualitative variable such as gender and peripheral neuropathy in freshly diagnosed cases of T2DM. Stratification for age, gender and FPG was recorded to address the effect modifiers. The Chi-square test was applied. A p-value < 0.05 was considered as significant.

RESULTS

Overall, 150 subjects fulfilling the inclusion criteria were registered to establish the frequency of neuropathy in freshly diagnosed cases of T2DM. According to age distribution; 42.67% subjects were aged 30 – 45 years while 57.33% subjects were in the age range of 46 – 60 years. The mean age of all the subjects was 46.35 ± 9.52 years. Gender distribution showed 54.0% males and 46.0% females. Mean FPG levels were recorded as 154.49 ± 15.84 (Table 1).

Frequency of peripheral neuropathy in freshly diagnosed cases of T2DM was recorded in 20.67%

Table 1: Age groups and gender of patients n = 150.

Variables	No. of Patients	%
Age Groups		
30-45	64	42.67.0%
46-60	86	57.33.0%
Total	150	100.0%
Gender		
Males	81	54.0%
Females	69	46.0%
Total	150	100.0%
Age (Mean ± SD)	46.35 ±9.52 years	
PGF (Mean ± SD)	154.49 ± 15.84	

(n = 31) while 79.33% (n = 119) patients had no findings of peripheral neuropathy (Table 2).

Table 2: Peripheral neuropathy among newly diagnosed cases of type ii diabetes mellitus (n = 150).

Peripheral Neuropathy	No. of Patients	%
Yes	31	20.67
No	119	79.33
Total	150	100

On stratification for gender and age was recorded to address the effect modifiers, and there was no significant association found according to age and gender, p-values were quite insignificant (Table 3).

Table 3: Peripheral neuropathy according to age and gender (n = 150).

Effect Modifiers		Peripheral Neuropathy		P value
		Yes	No	
Age groups	30 – 45	15	49	0.461
	46 – 60	16	70	
Gender	Male	17	63	0.852
	Female	14	56	

DISCUSSION

Diabetes mellitus (DM) is a highly frequent endocrine condition and a major health problem. DM is correlated with high-risk complications, mainly micro and macro vascular complications. These complications of DM include neuropathy, retinopathy, and nephropathy. Diabetic neuropathy remains a highly frequent complication of DM. This study was designed with the view that little data is available in our local population newly diagnosed with diabetes mellitus to address this issue while the international studies are also showing a significant variation; however the results of this study will clarify the variation in our targeted population and also record the exact frequency. In this study frequency of neuropathy among freshly diagnosed cases of T2DM was recorded in 20.67%. Consistently Gill HK et al¹¹ conducted similar studies on newly diagnosed patients with DM and reported that the incidence of diabetic peripheral

neuropathy was 29.2%, which is higher in contrast to this study. Inconsistently Iftikhar et al¹² reported that diabetic peripheral neuropathy was 74.8%, which is very high as compare to this study, and this difference may be because she had studied patients with prolonged duration of DM > 20 years and we studied patients only 6 months duration of diabetes. Khawaja et al¹³ reported that the overall incidence of diabetic peripheral neuropathy was 39.5%. Other international studied showed incidence of diabetic peripheral neuropathy 45.00%, 31.9.00%, and 29.2.00% in Saudi Arabia, Iran, and United Arab Emirates.¹⁴⁻¹⁶ Ashok et al¹⁷ reported an incidence of 5.4% T2DM cases with neuropathy when diagnosis was made. These variances in the incidence of diabetic neuropathy in various studies in addition to our study can be explained because this study used electrophysiological and clinical studies, while others in addition to Ashok et al¹⁷ used a biothesiometer, which is relatively a less sensitive technique to detect neuropathy. A recent study recorded 16.8% of the freshly diagnosed T2DM with peripheral neuropathy.¹

In current study patients’ mean age was 46.35 ± 9.52 years; 53.33% subjects were males while 46.67% were females. Lakhier et al¹⁸ reported that mean of patients was 45.19 years and according to gender distribution, 54.0% were males and 46.0% were females. Similarly Gill HK et al¹¹ reported that the mean age of patients was 47.6 ± 10.2 years, and 59% were males and other were females. Iftikhar M et al¹² reported that the mean age of study participants was 49.52 ± 7.93 years. Ather et al¹⁹ reported an age range of 39 – 90 years with a mean age of (58 ± 11.2) in neuropathy subjects. In this study, we did not find any significant impact of age and gender on incidence of peripheral neuropathy. While inconsistently Gogia et al²⁰ reported that males were more effected in contrast to females, while Bansal et al²¹ found that there was no sex-significant differences. However a factor for the majority of patients with neuropathy when the diagnosis was done for DM in our patients can possibly be because of delay in the condition’s diagnosis, as a result of no knowledge and lack of financial resources. We are of the view that the frequency of diabetic peripheral neuropathy varies, however our findings are helpful for the newly diagnosed type II diabetics and physicians as well for timely management of the morbidity.

CONCLUSION

It was concluded that the peripheral neuropathy was 20.67% among newly diagnosed patients with diabetes mellitus. Freshly diagnosed cases of diabetes should be routinely examined and managed at early stage on the initial development of sing symptoms of peripheral neuropathy to decrease the morbidity and mortality.

Additional Information

Disclosures: Authors report no conflict of interest.

Human Subjects: Consent was obtained by all patients/ participants in this study.

Conflicts of Interest:

In compliance with the ICMJE uniform disclosure form, all authors declare the following:

Financial Relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.

Other Relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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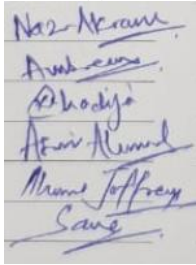
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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr.#	Author's Full Name	Intellectual/Contribution to Paper in Terms of:	
1.	Naz Akram (Main/Principal Author).	1. Proposed topics and Basic Study Design, methodology.	Signature by the author(s) 
2.	Ambreen Butt (2nd Author)	2. Data collection and calculations. Manuscript writing.	
3.	Khadija Waheed (3rd Author)	3. Analysis of data and interpretation of results etc.	
4.	Asim Ahmad (4th Author)	4. Paper writing, referencing, Data Calculations and quality insurer	
5.	Ahmad Jaffrey (5th Author)	5. Study Design and methodology	
6.	Sana Ahmed (6th Author)	6. Literature review	

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