DOI: https://doi.org/10.53350/pjmhs22161898

ORIGINAL ARTICLE

Prevalence of Diabetic Neuropathy in Diabetic Type II Patients from Khyber Pakhtunkhwa

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ABSTRACT

Introduction: Diabetic neuropathy is the main cause of neuropathy and major complications of diabetes mellitus throughout the world. This may lead to incapacity and amputations due to severe diabetes. The morbidity and mortality rates increase in diabetes due to severe neuropathy. The present study was aimed to determine the prevalence of diabetic diabetic neuropathy in diabetic mellitys type II affected patients.

Materials and Methods: This research took place in Peshawar from September 2019 to January 2020. A total of 205 blood samples were collected from diabetic patients with type II diabetes, both neuropathic (n=105) and non-neuropathic (n=100). Blood samples were taken in order to estimate random blood sugar levels (RBS).

Results: The age group 50-55 years had the highest percentage of cases (66.8%), followed by 56-60 years (21.5%), and 61-65 years (5.5%). Female patients were more likely than male patients to have diabetes, both neuropathic (62.9 percent) and non-neuropathic (58 percent). The predominance of neuropathic and non-neuropathic diabetes patients involved in this study because it was undertaken in Peshawar.(50.2 percent).

Conclusion: It is concluded that female were more prone to diabetes both with neuropathy and without neuropathy.

Keywords: Prevalence, Diabetes, Neuropathy, Diabetic mellitus type II,

INTRODUCTION

Diabetes neuropathy is the most frequent complication among diabetics, and it is responsible for a high rate of death and morbidity, as well as a significant expense of health care[1]. Neuropathy is defined as a damage to a peripheral nerve that starts in the nerve and progresses to the toes[2]. This injury causes pain, tingling, burning, and other uncommon symptoms including numbness, loss of balance, inability to perceive toe position, loss of warmth, and loss of touch sensitivity in the legs and feet[3]. Impotence, heart issues, kidney disorders, vision impairment, and amputation are some of the other consequences that can cause a major decline in quality of life[4]. Diabetic neuropathy has become more common over time as a result of poor glucose control[5,6].

Diabetic neuropathy is a worldwide affliction that affects millions of individuals. It's also becoming more of an issue in places where obesity is widespread. Although the most prevalent clinical signs of diabetic neuropathy were found in the mid-nineteenth century, our knowledge of the condition has recently improved[7]. As a result of inadequate glucose management, diabetic neuropathy has become increasingly frequent over time[8]. T1DM can develop to severe diabetic polyneuropathy in a matter of months if it is not effectively treated after start in young adults[9].

After some weeks, a small number of people with diabetes develop "multifocal diabetic neuropathy," that impacts the nerves and roots of the trunk, lower and upper extremities. Further to that, "unilaterally or bilaterally," the distal area of the lower extremities is sometimes regularly implicated, and proximal inadequacies are also present in significant patients[10].

PDN can be very painful, and "traditional therapies" are typically useless. In such cases, treatment with "corticosteroids" for a few weeks or months, combined with glycemic control adjustment, is a good idea. It's vital to recall that focused "diabetic neuropathies" have a usually good "spontaneous prognosis"[11]. However, no research has been done to assess if diabetes control has improved in our clinical context over time as knowledge of the disease pathophysiology has increased. As a result, the purpose of our study was to find out how common diabetic neuropathy is in Khyber Pakhtunkhwa.

MATERIALS AND METHODS

Between October 2019 and March 2020, a six-month descriptive comparative cross-sectional research was conducted. The study was conducted at Hayatabad, Peshawar, at the University of Peshawar's Chemistry Department and the Hayatabad Medical Complex Hospital's Biochemistry Section. Patients suspected of having diabetes were initially tested and diagnosed with type 2 diabetes. All of these patients, both with and without neuropathy, had their folic acid levels tested. A total of 205 samples were collected, with 105 and 100 samples acquired from known type 2 diabetes mellitus patients with diabetic neuropathy and without neuropathy, respectively, as a control group.

The ethics committees of the University of Peshawar and the Hayatabad Medical Complex Hospital in Peshawar approved the study. Following the approval of the study by the ethics committee, all patients provided both oral and written consent. This study included patients with type 2 diabetes mellitus (T2DM), regardless of gender or age. Individuals with Type 1 diabetes, pregnant women with

gestational diabetes, and diabetic type 2 patients with comorbid conditions leading to peripheral naturopathy as seen in neuropathy due to vital organ failure, such as end-stage kidney failure, chronic liver disease, and lung failure, as well as malignancies, were excluded.

A single sample was collected in sodium fluoride vacutainer tubes for random blood sugar testing (grey top). The hexokinase enzymatic approach was used to test random blood sugar using the Cobas-6000 analyzer. All of the data was collected and analysed using SPSS-20.The T-test was used to determine the significance of numerical variables and the Chi-square test was used to compare categorical variables. Clinical significance was defined as a P-value of greater than 0.005. Tables and graphs were used to present the data that had been analysed.

RESULTS

A total of 205 blood samples (n=105 and 100, respectively) were collected from diabetic individuals with and without neuropathy. All of the patients were over the age of 50, with the 50-55 year age group having the largest number of cases (66.8 percent), followed by 56-60 years, 61-65 years, 66-70 years , and older years with 21.5%, 5.5%, 5.0%, and 5.0% respectively. 62. female with neuropathy and 58% without neuropathy were more likely to have diabetes than male neuropathic patients (37.1 percent) or without neuropathy (42 percent) (Table. 1).

Table No. I: Age and gender distribution of Neuropathic diabetic patients and Non-Neuropathic Diabetic Patients

Age	Group 1			Group 2			Grand Total n (%)
	Male Patients n (%)	Female Patients n (%)	Total Patients n (%)	Male Patients n (%)	Female Patients n (%)	Total Patients n (%)	
50-55 years	23 (21.9)	41 (39.0)	64 (61)	28 (28)	45 (45.0)	73 (73.0)	137 (66.8)
56-60 years	10 (9.5)	17 (16.2)	27 (25.7)	08 (8.0)	08 (8.0)	16 (16.0)	43 (21.5)
61-65 years	02 (1.9)	04 (3.8)	06 (5.7)	02 (2.0)	03 (3.0)	05 (5.0)	11 (5.5)
66-70 years	04 (3.8)	04 (3.8)	08 (7.6)	02 (2.0)	00 (00)	02 (2.0)	10 (5.0)
>-70 years	00 (00)	00 (00)	00 (00)	02 (2.0)	02 (2.0)	04 (4.0)	04 (02)
Total	39 (37.1)	66 (62.9)	105 (100)	42 (42.0)	58 (58.0)	100 (100)	205 (100)

Group 1: Neuropathic patients; Group 2: Non-neuropathic patients

The most of neuropathic and non-neuropathic diabetes patients (50.2 percent) were from Peshawar, where the study was done. Patients from Khyber Agency were commonly examined after that, followed by Charsadda and Mardan (both n=13) (Table. 2).

Table 2: District-wise distribution of Neuropathic and Non-Neuropathic Patients

Districts	Group 1	Group 2	Total
	Number of patients	Number of patients	% (n)
Peshawar	51	52	50.2 (103)
Khyber Agency	5	14	09.5 (19)
Charsadda	8	5	07.5 (13)
Mardan	7	6	07.5 (13)
Dir	7	5	06.0 (12)
Shabqadar	6	1	03.5 (07)
Karak	1	5	03.0 (06)
Bannu	4	1	02.5 (05)
Swat	4	1	02.5 (05)
Kabul	1	3	02.0 (04)
Nowshera	2	2	02.0 (04)
Hangu	0	3	01.5 (03)
Parachinar	3	0	01.5 (03)
Kohat	2	0	01.0 (02)
Swabi	2	0	01.0 (02)
Mohmand Agency	1	0	00.5 (01)
Bajaur Agency	1	0	0.50 (01)
Buner	0	1	0.50 (01)

Group 1: Neuropathic patients; Group 2: Non-neuropathic patients

DISCUSSION

This cross-sectional study was conducted in Peshawar, where diabetes prevalence was fast growing. The incidence of type 2 diabetes in Pakistan is dangerously high, at 16.9 percent, according to Hassan *et al.,* population-based study [12]. Diabetes prevalence in Pakistan varied from 7.6 percent to 11 percent, according to Hakeem *et al.,* [13]. Neuropathy is the most prevalent diabetic consequence, followed by retinopathy, nephropathy, ischemic heart disease, and peripheral vascular disease[14].

Diabetic patients with neuropathy were detected in 39 men and 66 females in this study, while diabetic patients without neuropathy were found in 42 males and 58 females. Neuropathy was also discovered to be more prevalent in female diabetes individuals than male diabetic patients. Females had 59.13 percent of diabetes type 2 patients and men had 40.86 percent, showing that females had a larger frequency of diabetic type 2 patients than males, according to a study by Khan *et al.,*[15]. In Zia *et al.,* study, females were also shown to have a significant prevalence of diabetic type 2 diabetes[14]. In the San Luis Valley cohort study, 25.8 percent of diabetes patients had peripheral neuropathy. According to the findings of the Karki *et al.,* study, there is no statistically significant difference between men and women in type 2 diabetes. A number of additional studies noticed it as well[16,17].

According to Tesfaye *et al.,* diabetes mellitus age is a statistical important risk factor for diabetic peripheral neuropathy[18]. According to current statistics, those aged 50 to 55 years are more likely to develop diabetic neuropathy, followed by people aged 56 to 60 years (21.5 percent), 61-

65 years (5.0 percent), 66 to 70 years (5.0 percent), and people aged >70 years (2.0 percent). The current study substantially contradicts the findings of Karki *et al.,* who found that as persons age, statistically significant risk variables for diabetic peripheral neuropathy increase[16].

A meta-analysis of neuropathy prevalence in diabetic patients (type I and II) in Iran found a rate of 53%, which is higher than the current study's findings. DPN has previously been shown to be common in type II diabetic patients[19]. Such disparities have been attributed on the patients' age groups. The type of diabetes and age group of patients have been shown to impact the overall prevalence of neuropathy[19,20]. Diabetes and its consequences, such as diabetic neuropathy, are exacerbated by oxidative stress induced by free radicals. A range of physiological issues, including DNA and neuron damage, have been related to oxidative stress[21]. Nuclear abnormalities are reported to be more prevalent in diabetic patients with neuropathy than in diabetic patients without neuropathy, which might be ascribed to oxidative stress. Oxidative stress activates a multitude of pathways in diabetes individuals, finally leading to neuropathic complications[22].

This study looked into no vitamins or risk factors. Furthermore, the sample size was limited, and the results were not compared to type I diabetes. This study, on the other hand, helps to determine the prevalence of diabetic neuropathy in our area. Patients were also separated into age and gender categories.

CONCLUSION

Diabetes and diabetic neuropathy, as well as poor glucose management, are more frequent in women and the elderly, according to our data. More study is required to better understand and uncover the connections between diabetes and neuropathy. More effective therapy techniques are needed for both neuropathic and non-neuropathic diabetes patients.

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