Frequency of peripheral neuropathy in newly diagnosed cases of type II diabetes mellitus.

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ABSTRACT... Objective: The aim of this study is to determine the frequency of peripheral neuropathy in newly diagnosed cases of type II diabetes mellitus. Study Design: Cross Sectional Study. Setting: Department of Medicine at Avicenna Medical & Dental College, Lahore. Period: 1st February 2020 to 31st July 2020. Material & Methods: One hundred and twenty newly diagnosed patients of type 2 diabetes mellitus were enrolled in this study. Patients detailed demographically recorded after getting written consent. Patients were diagnosed for the duration of 4-weeks and calculated fasting blood sugar (FBS) of ≥126mg/dl, and Random Blood Sugar (RBS) of ≥200 mg/dl or HbA1c ≤6.5. Results: Seventy (58.3%) were males and rest 50 (41.7%) were females with mean age 37.15±10.91 years. Mean body mass index of the patients was 22.48±3.66 kg/m². Forty two (35%) patients had symptoms of peripheral neuropathy while that patient’s who did not have any symptom was 78 (65%). Same symptoms were observed within 4-weeks and we noticed that 23 (19.2%) patients showed peripheral neuropathy and rest 97 (80.8%) patients did not have any symptoms. Conclusion: The frequency of peripheral neuropathy is higher in early stages of type II diabetes mellitus and its frequency can be reduced to diagnose within a month.

Key words: Diabetes Mellitus, Glucose, Metabolic Disorder, Peripheral Neuropathy.

INTRODUCTION
Diabetic mellitus (DM) is a severe metabolic disorder that affects to the world’s growing economic. As a cost for urbanisation, the overall diabetes situation in 2017 according to IDF estimates, shows there are 425 million diabetes adults and 352 million glucose deficient adults in the world.¹ In Jordan the alarming rates in obesity, growth in the population, transition to nutrition, and a major challenge.²,³

WHO’s figures suggest that the highest overweight and obesity rates in Egypt, Bahrain, Jordan, Kuwait, Saudi Arabia and the United Arab Emirates have been in 16 countries in the Eastern Mediterranean.⁴ Approximately 50% are expected to develop neuropathy based on the length of disease and the diabetic regulation.⁵,⁶

Multifactorial pathogenesis of peripheral diabetic neuropathy. The DPN can be categorized as widespread symmetry polyneuropathies and focus / multipocal neuropathies, while polyol pathway, advanced glycemic end products and oxidative stress and chronic hyperglycaemia have an important position. Symmetrical, distal sensorimotor polyneuropathy (DPN) is the most prevalent form of diabetes neuropathy.⁷ This is around 75% of diabetic neuropathy.⁸

There are no local data available regarding peripheral neuropathy prevalence in diabetic patients at the time of diagnosis; however, 7.5 percent of the patients at the time of diagnosis are reported to have neuropathy.⁹ Therefore, peripheral neuropathy is one of the key aspects when diabetic patients are advised and early detection of primary care is essential for initiation of the disease.

In this research we aimed to determine the frequency of peripheral neuropathy in newly diagnosed cases of type II diabetes mellitus.
MATERIAL & METHODS
This cross-sectional study was conducted at Avicenna Medical & Dental College, Lahore during the period of 1st February 2020 to 31st July 2020 with IRB approval letter No. SSTH-4637 dated 19-11-2020. A total of 120 patients of both genders with ages 25 to 60 years presented with peripheral neuropathy among newly diagnosed diabetes were enrolled. Patient detailed demographics including age, sex, residence and body mass index were recorded after taking written consent. Patients who had peripheral neuropathy due to other disease i.e. autoimmune, drugs, renal failure, liver disease, leprosy and malignancy were excluded from this study. All the patients were examined clinically and electrophysiological method was used (only for a purpose if required) within a month. Three types of muscles (sample) were tested to examine impression of neuropathy. Complete patients were examined to calculate fasting blood sugar (FBS) of ≥126 mg/dl, and Random Blood Sugar (RBS) of ≥200 mg/dl or HbA1c ≤6.5. Chi square test was performed to know the prevalence of duration of symptoms. All data was analyzed by SPSS 24.0

RESULTS
There were 70 (58.2%) males while 50 (41.8%) were females with mean age 37.15±10.91 years. Mean BMI was 22.48±3.66 kg/m^2 (Table-I). At start, we observed that the 42 (35%) patients had symptoms of peripheral neuropathy while that patient’s who did not have any symptom was 78 (65%). After continuously examination within a month, we observed the prevalence of symptoms 23 (19.2%) patients showed peripheral neuropathy as compared to these 97 (80.8%) patients did not show any symptoms (Table-II). Regular examination showed results that out of 23 patients, 8 (34.8%) patients showed peripheral neuropathy and the remaining 15 (65.2%) patients did not show any symptoms. That 97 (80.8%) patients who did not show symptoms at start, after further analysis 34 (35.05%) showed symptoms and 63 (64.95%) were not symptomatic (Table-III). We observed that the majority of the patients 45.8% were in 5th decade of peripheral neuropathy, 29.2% were in 4th decade and rest of 25% were in 6th decade of diabetic peripheral neuropathy.

DISCUSSION
Diabetic neuropathies are heterogeneous diseases that affect the multiple components of the patient’s nervous system. It is the most predominant complication of diabetes mellitus. Nerve complications can occur in patients with diabetes mellitus at any time, but longer, higher risk. It has been estimated that 50% of diabetic patients are neuropathic, but not all neuropathic patients have symptoms. This study found that in 45 (35%) patients, the symptoms of type II Diabetes Mellitus peripheral neuropathy were the same as those of Lakhiar. The variations between our various trials and our prevalence of peripheral diabetic neuropathy can be explained by the clinical and electrophysiological studies in our research, while other neuropathic studies in Wunderlich et al10, which is close to the findings of our study, showed 8 percent of type 2 diabetes...
at diagnosis.

The hypothesis that metabolism and obesity are risk factors for DPN is supported by current evidence. Nerve damage mechanisms suggested include extracellular protein glycation, a deposition of fats, oxidative stress, defective mitochondrial and counter-regulatory pathways to metabolising chronic inflammation.\textsuperscript{12,13} The restrictions are a multi-section design that could not determine the longer-term effects of DPN risk factors for glycemic regulation. Kestev et al\textsuperscript{14} have shown that insulin use among newly diagnosed diabetics in Germany and Great Britain is one of the highest risk factors for DPN.

Previous studies have shown clearly that diabetic patients suffering from other diseases are more likely to develop diabetic neuropathy including the degree of hypertension, dyslipidemia, insulin resistance, obesity, cigarette smoking and alcoholic consumption. The risk of diabetic neuropathy is correlated with a variety of modifiable and non-modifiable risk factors.\textsuperscript{15-21}

Our study is a large-scale clinical study, so that our findings will relate to people in the population receiving treatment. In addition, initial steps should be taken to avoid DPN from progressing and postpone the development of such a deteriorating complication in terms of lifestyle and behavioural improvements such as balanced food habits and exercises.

\textbf{CONCLUSION}

The symptoms of peripheral neuropathy were present in 35% patients and there is need to diagnose at its earliest stage to reduce prevalence. 

\textcopyright 23 May, 2021.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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| 1     | Altaf Ahmad Yar          | Data collection.                                                |                     |
| 2     | Munaza Javed             | Writing of manuscript.                                          | Muna J             |
| 3     | Muzamul Shahzad          | Statistical analysis.                                           |                     |
| 4     | Javed Iqbal              | Guidance in writing the manuscript.                             |                    |
| 5     | Muhammad Imran Aslam     | Review of article.                                              |                    |
| 6     | Zafar Ahmad Khan         | Collection of materials.                                        |                    |