

Occurrence of Painful Diabetic Peripheral Neuropathy among Type 2 Diabetic Patients Attending a Tertiary Care Hospital

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Abstract

Introduction: Diabetes affects 382 million people worldwide, and its prevalence is expected to increase to 592 million by the year 2035. Painful diabetic peripheral neuropathy (PDPN) is a common type of diabetic neuropathy and the most common cause of neuropathic pain. Hence, there is a need to access the incidence and the prevalence of this condition. The incidence of diabetes and its complications has increased to a greater extent among the rural population which have to be concentrated as there are lesser studies available for that population groups.

Materials and Methods: Incidence is tested by a cross-sectional descriptive study consisting of two phases: Phase 1, an initial screening questionnaire including one question about pain; Phase 2, neurological history and examination using the Toronto Clinical Scoring System (TCSS). The observations thus obtained are evaluated with suitable statistics tool (SPSS version 16), and results are represented in the form of figures and graphs.

Results: Total number of subjects were 100 of them 59 were male and 41 were female. Diabetic age of the individuals ranges between 2 and 19 years. The highest score with TCSS was 13 and least was 3. More than 86% of the subjects were suffering from peripheral neuropathy among which 46% are with mild and 35% with moderate and 5% with severe grades of DPN. Incidence of PDPN was increasing rapidly with the raising fasting blood sugar (FBS) levels and was 100% with FBS levels more than 261 mg/dl.

Conclusions: PDPN incidence among the diabetic individuals is relatively high in the study population. Age does not influence the occurrence of PDPN among the diabetics while the diabetic age of the individuals has a highly significant relation with the occurrence of PDPN. The occurrence of PDPN was more among the individuals with high FBS levels which indicate the necessity of controlled glycemic levels in the prevention of complications associated with diabetes mellitus.

Key words: Neuropathic pain, Painful diabetic peripheral neuropathy, Rural population, Toronto clinical scoring system

INTRODUCTION

Diabetes affects 382 million people worldwide, and its prevalence will be increasing to 592 million by the year 2035.¹ Diabetic peripheral neuropathy (DPN), also known

as distal symmetric polyneuropathy, is a well-known, long-term complication of diabetes which occurs in 30-50% of patients with the disease² and is associated with a higher rates of morbidity and mortality.³ Members of an International Consensus Meeting on the outpatient diagnosis and management of DPN agreed on a simple definition of diabetic neuropathy as “the presence of symptoms and/or signs of peripheral nerve dysfunction in people with diabetes after the exclusion of other causes.”⁴

Diabetic neuropathy can have a number of clinical or subclinical presentations. Painful diabetic neuropathy

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(PDN) is a common type of diabetic neuropathy and the most common cause of neuropathic pain.⁵ PDN symptoms exhibit a symmetrical “stocking and gloves” distribution and have frequent nocturnal exacerbations. It can present from a mild pins and needle sensation to stabbing, burning, unremitting, or even unpleasant electric shock sensation. Allodynia in the form of cutaneous hypersensitivity leading to acute distress on contact with an external stimulus, such as clothing can also occur.⁶ The pain is often worse at night and often disturbs sleep, causing tiredness during the day. This may be so painful that the performance of daily activities is disturbed, thereby impacting their employment and social life. The constant, unremitting pain and withdrawal from social life often result in depression symptoms.⁷ In the severe cases, patients lose their appetite and experience significant weight loss, which is reported in the literature as “diabetic neuropathic cachexia.”⁶

It was quoted in a recent review⁸ that knowledge of the epidemiology of painful DPN (PDPN) “is compromised by the lack of large population-based studies and by the lack of agreement by authorities on diagnostic criteria, precise definitions, and grading of severity of PDPN. These problems can lead to potentially important sampling biases and measurement error.” Furthermore, the incidence of diabetes and its complications were increased to a greater extent among the rural population. Incidence is tested by a cross-sectional descriptive study consisting of two phases: Phase 1, an initial screening questionnaire including one question about pain; Phase 2, neurological history and examination using the Toronto Clinical Scoring System (TCSS). Subjects with peripheral neuropathy completed the neuropathic pain scale (NPS) to assess severity and nature of the pain. The observations thus obtained are evaluated with suitable statistics tool (SPSS version 16) and results are represented in the form of figures and graphs.

MATERIALS AND METHODS

The study was approved by the local Ethics Committee and written informed consent was obtained from each patient.

Study Design

It is a study done in a clinical setting in two phases. Phase 1 an initial screening questionnaire including one question about pain; Phase 2, neurological history and examination use the TCSS. Subjects with peripheral neuropathy completed the NPS to assess severity and nature of the pain and impact on quality.

Study Duration

The study was conducted during the months of June and July of 2014.

Study Population

The subjects are the Type 2 diabetic patients visiting our outpatient unit of General Medicine Department of our institute.

Sample Size and Selection Criteria

The sample size is 100. The criterion for selection is those who were suffering from Type 2 diabetes for more than 2 years.

Exclusion Criteria

Subjects with Type 1 are excluded from the study. Subjects who have other possible causes for having peripheral neuropathy are excluded from the study.

Data Collection Procedures and Instruments

Phase 1: Primary survey

All eligible subjects are given instructions about the research and are requested to answer screening questionnaire. The latter included the question, “Do you have a burning, aching or tenderness in your legs or feet?” This was taken from the diabetic neuropathy symptom score. Subjects were also asked the year of diagnosis of diabetes.

Phase 2: Clinical examination and further assessment

Those eligible subjects from Phase 1 of the study were enrolled in the second phase, in which a clinical neurological history and examination were carried out by one observer (M.D.) who assessed the presence and severity of PDPN. Peripheral neuropathy was assessed using the validated TCSS.⁹ Subjects with peripheral neuropathy completed the NPS by which the sensation of pain is categorized into neuropathic and non-neuropathic.

RESULTS

Sex Distribution

Total number of subjects in the present study was 100. The majority of these patients in present study were males 59% (59 males). 41 patients were females (41%) (Figure 1).

Age Distribution

Regarding age distribution least age of the individual was 33 years and the highest was 71 years.

The majority of the patients in the present study were between age groups of 51 and 60 years (40%) (Figure 2).

Duration of Diabetes

Diabetic age of the individuals ranges between 2 and 19 years. 55 patients in the present study had duration of diabetes between 2 and 5 years which constituted the majority (Figure 3).

Type of Medication

About 76 patients in present study were using only oral hypoglycemic drugs. 24 patients in the present study were using both oral hypoglycemic drugs and insulin preparations (Figure 4).

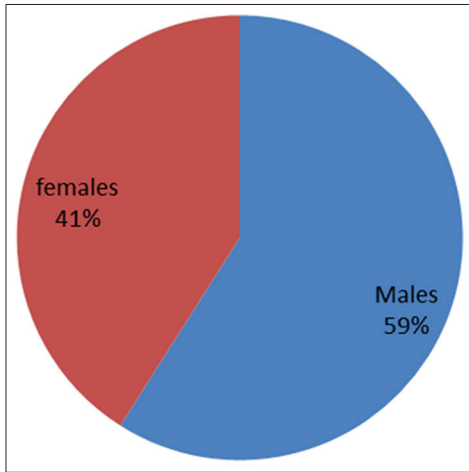


Figure 1: Sex distribution

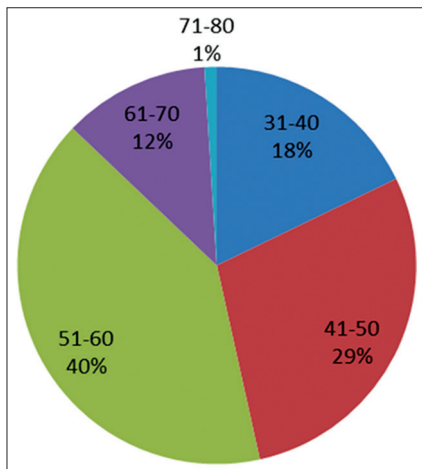


Figure 2: Age distribution

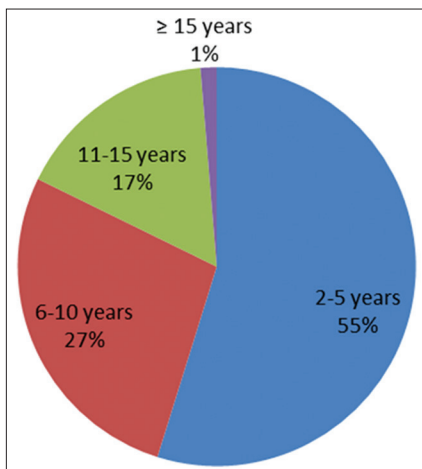


Figure 3: Duration of diabetes

Fasting Blood Sugar (FBS) Levels

FBS levels among the subjects least observation was 100 mg/dl, and the highest was 377 mg/dl. The majority of the patients had FBS levels between 100 and 160 mg%. 23% had FBS levels between 161 and 210 mg% (Figure 5).

Diabetic Neuropathy Grading

14 patients had no diabetic neuropathy. The majority (46%) had mild neuropathy; 35% had moderate neuropathy and 5% had severe neuropathy. The highest score with TCSS was 13 and least was 3 (Figure 6).

Severity of Neuropathic Pain

28 patients had non-neuropathic pain. 27% had mild neuropathic pain. The majority (33%) had moderate neuropathic pain. 27% had mild neuropathic pain. 12% had severe neuropathic pain. NPSS score ranges between 2 and 9 (Figure 7).

Prevalence of PDPN

79 patients had PDPN. 21 patients had no PDPN (Figure 8).

Correlation of PDPN with Age

There was no positive correlation of age with occurrence of PDPN in the present study (Figure 9).

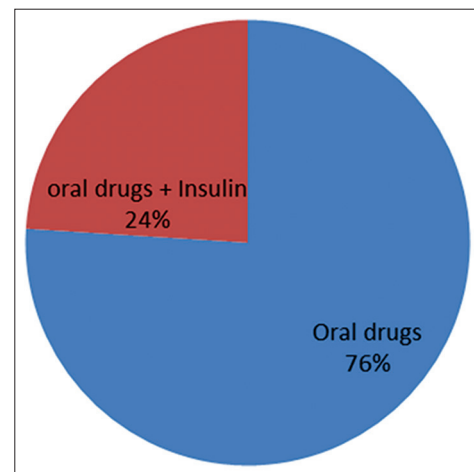


Figure 4: Type of medication

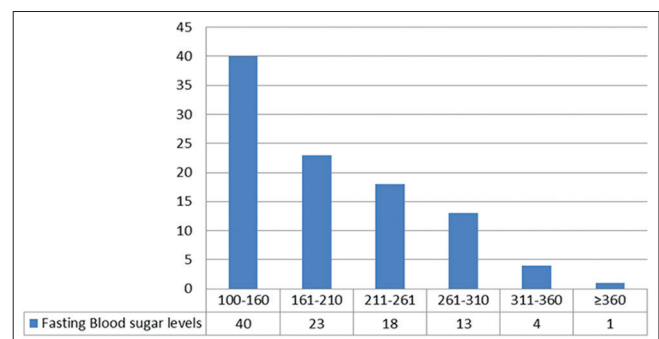


Figure 5: Fasting blood sugar levels

Correlation of PDPN with Duration of Diabetes

There was positive correlation between occurrence of PDPN and duration of diabetes. As the duration of diabetes increases, there is a steady increase in the occurrence of PDPN. Patients with duration of diabetes of more than 15 years had 100% occurrence of PDPN (Figure 10).

Correlation of PDPN with FBS Levels

In the present study, the occurrence of PDPN was increasing with the increasing fasting blood glucose levels and was 100% with FBS levels more than 261 mg/dl (Figure 11).

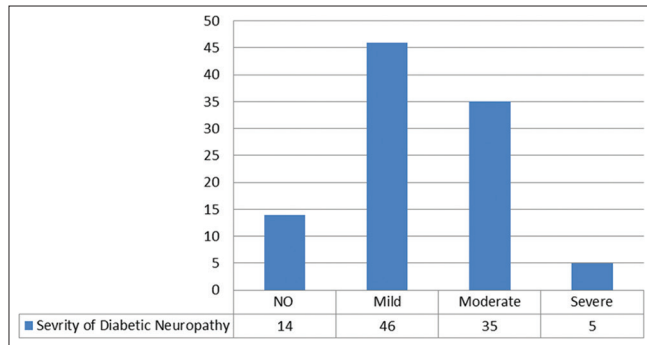


Figure 6: Grading of diabetic neuropathy

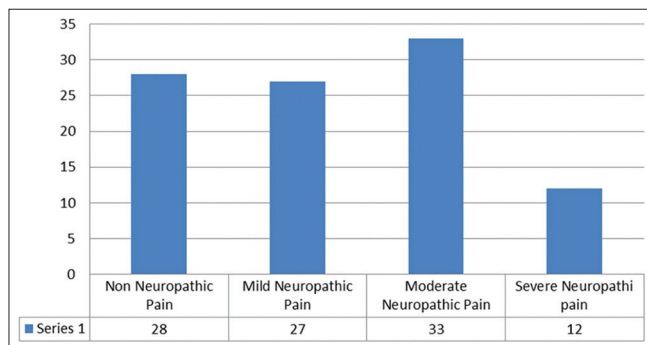


Figure 7: Severity of pain

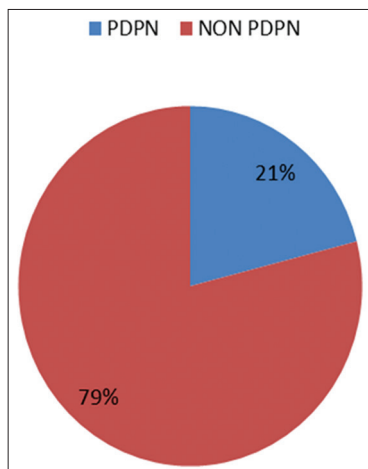


Figure 8: Prevalence of painful diabetic peripheral neuropathy

DISCUSSION

On observation of results, more than 86% of the subjects were suffering from peripheral neuropathy among which 46% are with mild and 35% with moderate and 5% with severe grades of DPN. Among the total subjects, 72% are with neuropathic pain among which severity is mild in 27%, moderate in 33% and severe in 12% of the individuals. Among the total subjects nearly three-fourths were suffering from PDPN, which is very much higher than that of the literature available both in India and among other parts of the world.^{10,11} There is no much influence of age among the diabetics in the occurrence of PDPN. But with the increase in diabetic age the occurrence of PDPN

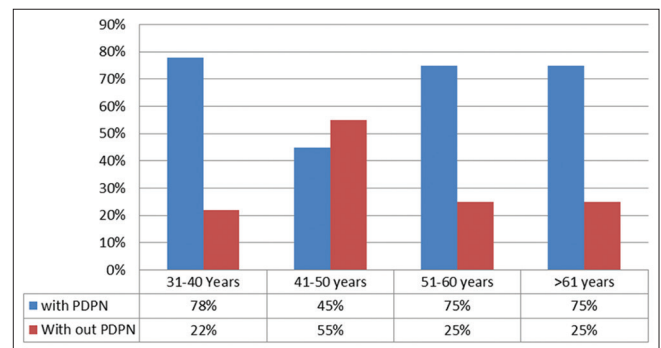


Figure 9: Painful diabetic peripheral neuropathy versus age

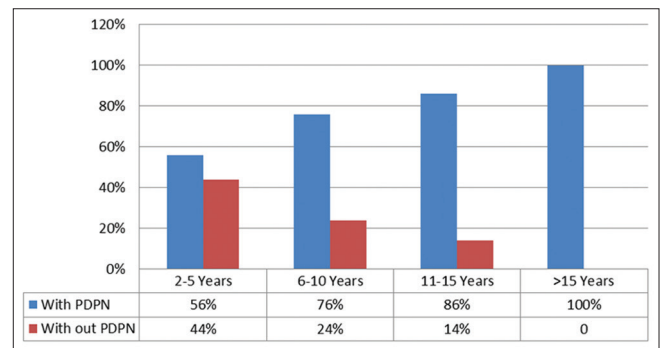


Figure 10: Painful diabetic peripheral neuropathy versus duration of diabetes

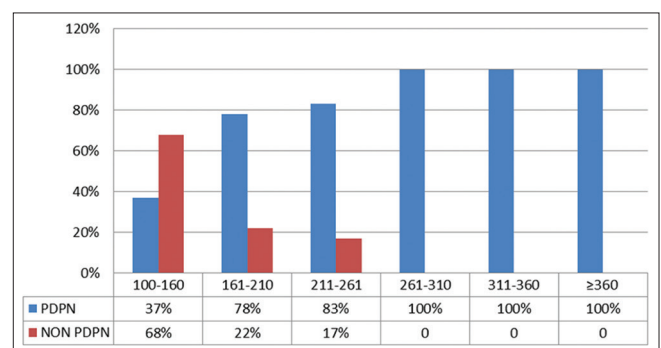


Figure 11: Fasting glucose level versus painful diabetic peripheral neuropathy

among the subjects was increasing with diabetic age and was 100% in the individuals with a diabetic age of more than 15 years. These results were in par with the other published studies.^{10,11} On observing the trends of occurrence with the fasting blood glucose levels, incidence was increasing rapidly with the FBS levels and was 100% with FBS levels more than 261 mg/dl. Though these results were in par with the ongoing studies, cohort study has to be done to know about the relation of blood glucose levels with the occurrence of PDPN.

CONCLUSION

From the above discussion, it can be concluded that PDPN incidence among the diabetic individuals is relatively high in the study population. Age doesn't influence the occurrence of PDPN among the diabetics while the diabetic age of the individuals has a highly significant correlation with the occurrence of PDPN. The occurrence of PDPN was more among the individuals with high FBS levels which indicate the necessity of controlled glycemic levels in the prevention of complications associated with diabetes mellitus.

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