

# Prevalence of Diabetic Peripheral Neuropathy in Individuals Having Type- II Diabetes Mellitus

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Received: August 2019

Accepted: September 2019

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## ABSTRACT

**Background:** Diabetes mellitus is a devastating metabolic disorder that places an economic burden. The present study was conducted to assess prevalence of diabetic peripheral neuropathy in type II diabetics. **Methods:** The present study was conducted on 114 type II diabetes patients of both genders. Patients were subjected to fasting blood sugar, random blood sugar and glycosylated hemoglobin to know diabetic status. A thorough clinical examination was done. Physical signs such as numbness, ulcerations loss of reflexes were recorded. **Results:** Out of 114 patients, males were 64 and females were 50. Out of 114 patients, 46 (40.3%) had PNP. In patients with PDN, 32 had ulcerations and 38 had numbness of limbs. The difference was non-significant ( $P > 0.05$ ). There were 2 cases of DPN with 5 years, 10 cases with 5-10 years and 34 cases with  $>10$  years of DPN. The difference was significant ( $P < 0.05$ ). **Conclusion:** Authors found that among type II diabetic patients, 46 had diabetic peripheral neuropathy.

**Keywords:** Diabetes, diabetic peripheral neuropathy, ulcer

## INTRODUCTION

Diabetes mellitus (DM) is a devastating metabolic disorder that places an economic burden for every country around the world with the global increasing trend. As a cost of urbanization, the overall status of diabetes according to IDF estimates in 2017 showed that there are now 425 million adults with diabetes and 352 million adults with impaired glucose tolerance worldwide.<sup>[1]</sup>

The two main complications affecting limbs, mainly feet and legs, are diabetic polyneuropathy (DPN) which affects between 30 and 50% of diabetics and diabetic leg and foot ulcers. The lifetime incidence of foot ulcers occurring in DM patients is up to 25%. Diabetic neuropathy is the primary risk factor for the development of diabetic foot ulcers and is implicated in 50–75% of nontraumatic amputations.<sup>[2]</sup>

Neuropathy is the most common microvascular complications among diabetics that can involve peripheral, central and/or autonomic nervous systems. It can also develop at earlier stages of dysglycemia as in the prediabetics phase.<sup>[3]</sup> Peripheral neuropathy

(PN) is the predominant variety in patients with diabetes whether type 1 or type 2. It manifests as distal symmetrical polyneuropathy (DSPN), also known as diabetic peripheral neuropathy (DPN), causing nerve damage in the extremities particularly the feet, in addition to radiculopathy and mononeuropathy. Clinically, DPN is defined as the presence of symptoms or signs of peripheral nerve dysfunction in people with diabetes after other possible causes have been excluded.<sup>[4]</sup> The present study was conducted to assess prevalence of diabetic polyneuropathy in type II diabetics.

## MATERIALS AND METHODS

The present study was conducted in the department of general medicine. It comprised of 114 type II diabetes patients of both genders. They were informed regarding the study and written consent was obtained. The study protocol was approved from institutional committee.

Patient information such as name, age, gender etc. was recorded. Patients were subjected to fasting blood sugar, random blood sugar and glycosylated hemoglobin to know diabetic status. A thorough clinical examination was done. Physical signs such as numbness, ulcerations loss of reflexes were recorded. Results were tabulated and subjected to statistical analysis using chi square test. P value  $< 0.05$  was considered significant.

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## RESULTS

Table 1: Distribution of patients

Total - 114		
Gender	Male	Female
Number	64	50

[Table 1 & Figure 1] shows that out of 114 patients, males were 64 and females were 50.

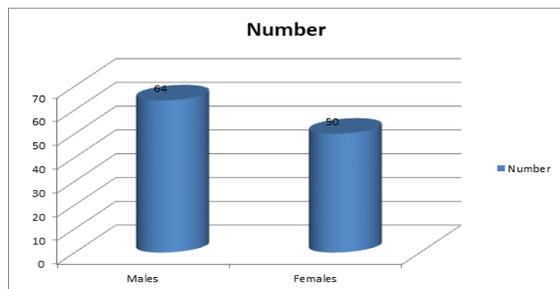


Figure 1: Distribution of patients

Table 2: Prevalence of DPN

Total	Number	Percentage
114	46	40.3%

[Table 2, Figure 2] shows that out of 114 patients, 46 (40.3%) had PNP.

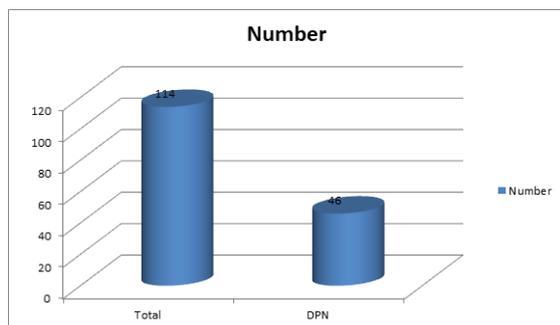


Figure 2: Prevalence of PNP

Table 3: Clinical features in patients with DPN

Clinical findings	Number	P value
Ulcerations	32	0.92
Numbness	38	

[Table 3, Figure 3] shows that in patients with PDN, 32 had ulcerations and 38 had numbness of limbs. The difference was non-significant ( $P > 0.05$ ).

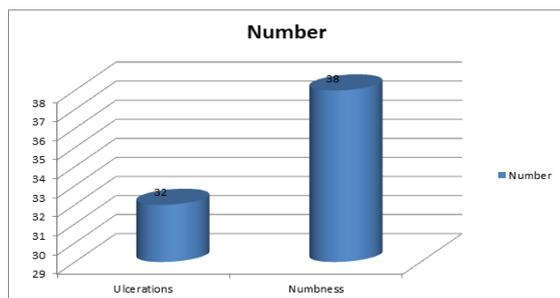


Figure 3: Clinical features in patients with DPN

Table 4: Duration of Diabetes and DPN

Duration (Years)	Number of DPN	P value
5	2	0.01
5-10	10	
>10	34	

[Table 4, Figure 4] shows that there were 2 cases of DPN with 5 years, 10 cases with 5-10 years and 34 cases with >10 years of DPN. The difference was significant ( $P < 0.05$ ).

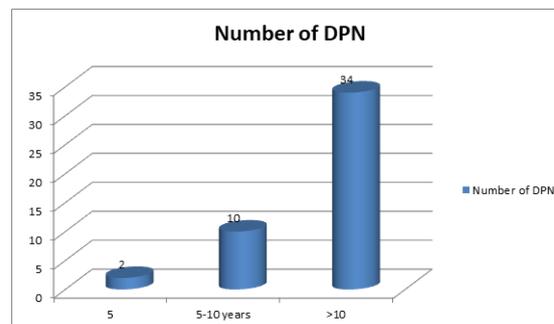


Figure 4: Duration of Diabetes and DPN

## DISCUSSION

Diabetic peripheral neuropathy (DPN) is common with prevalence ranging from 40% to 50% of all patients with longstanding diabetes. DPN term refers to peripheral nerve dysfunction and damage in diabetic patients after exclusion of other causes. The definition encompasses a heterogeneous group of presentations.<sup>[5]</sup>

Clinical presentation of DPN could be asymptomatic, typical neuropathic pain, atypical neuropathic pain, altered or decreased sensations.<sup>[6]</sup> Motor or sensorimotor symptoms may present early on in the form of weakness and wasting. Asymptomatic DPN is not uncommon. Typical neuropathic pain refers to the typical presentation of stocking and gloves pain. Atypical neuropathic pain covers many forms of peripheral neuropathic pain that varies in site and character. Pain could be refractory to treatment and affects patient quality of life.<sup>[7]</sup> The present study was conducted to assess prevalence of diabetic polyneuropathy in type II diabetics.

In this study, out of 114 patients, males were 64 and females were 50. Out of 114 patients, 46 (40.3%) had PNP. Callaghan et al<sup>[8]</sup> conducted a study and found that the mean age was 57.2 yrs. A total of 238 (72%) had type 2 and 89 (27.2%) had type 1 DM. The prevalence of peripheral neuropathy was 72.2% of whom 55% were severe, 19% were moderate, and 26% were mild. The severity of neuropathy increased with the increase in age >40 years and increase in body mass index ( $p < 0.001$ ) and duration of diabetes; duration >7 years. The main associated factors were age >40 years, OR 2.8, >60 years, OR 6.4, obesity, OR 6.7, and hypertension, DPN when present is mainly

irreversible; hence screening and identifying associated potentially modifiable risk factors is very crucial especially for the low-income countries. The main risk factors that are known to be associated with DPN are increasing age, longer duration of diabetes since diagnosis, poor glycemic control, and increased body mass index.<sup>[9]</sup>

We found that in patients with PDN, 32 had ulcerations and 38 had numbness of limbs. The difference was non-significant ( $P > 0.05$ ). There were 2 cases of DPN with 5 years, 10 cases with 5-10 years and 34 cases with  $>10$  years of DPN. Boulton et al,<sup>[10]</sup> in their study a total of 1003 patients with type 2 diabetes were recruited. The overall prevalence of DPN based on MNSI was 39.5%. The most frequently reported symptoms were numbness (32.3%) and pain with walking (29.7%), while the least reported symptoms were the history of amputation (1.3%) and loss of sensation in legs/feet while walking (3.8%). Logistic regression analysis revealed that unemployment, cardiovascular disease, dyslipidemia, diabetic retinopathy and long standing DM (diabetes of  $\geq 5$  years) were significantly associated with DPN.

It has been found that history, examination alongside investigations could help exclude other causes of neuropathy. Symptoms and signs that would warrant referral include an asymmetrical presentation, rapid progression and motor more than sensory signs. In everyday practice, recommended blood tests include serum B12, folic acid, thyroid functions, complete blood count and serum electrophoresis.<sup>[11]</sup> Patients with diabetes are likely to have B12 and Thyroid function abnormalities. B12 deficiency is more associated with malabsorption rather than nutritional deficiency.<sup>[12]</sup> Specifically, in type 2 diabetes population, B12 deficiency is more relevant because of long-term metformin use.

## CONCLUSION

Authors found that among type II diabetic patients, 46 had diabetic peripheral neuropathy.

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**How to cite this article:** Dabas P, Ahmad MS, Ahmad RK, Ranjan R. Prevalence of Diabetic Peripheral Neuropathy in Individuals Having Type- II Diabetes Mellitus. *Ann. Int. Med. Den. Res.* 2019; 5(6):CM06-CM08.

**Source of Support:** Nil, **Conflict of Interest:** None declared