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A Retrospective Study of Diabetic Peripheral Neuropathy among Patients with Diabetes Mellitus at a Tertiary Care Hospital in South India.

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ABSTRACT

Diabetes mellitus is characterized by high blood sugar level. The prevalence of type 2 diabetes is higher compared to type 1. Diabetic peripheral neuropathy (DPN) is the most common complication of diabetes mellitus. The aim of the study was to determine the prevalence of peripheral neuropathy among patients with diabetes mellitus at tertiary hospital in South India. Detailed study of medical records of 42 diabetic patients of tertiary care hospital was carried out. Categorization with respect to gender and type of diabetes was made. Patients diagnosed with neuropathy were further investigated based on the prevalence of symptoms. Data obtained from the study were expressed in percentage. Out of 42 diabetic mellitus patients 25 (60%) of them were females and 17 (40%) of them were males. Out of 25 female diabetic mellitus patients, 23 (92%) of them had type 2 diabetes mellitus while remaining 2 (8%) had type 1 diabetes mellitus. All male had type 2 diabetes mellitus. 12 out of 42 (29%) patients had diabetic peripheral neuropathy symptoms. In which, 9 (75%) of them were females and the remaining 3 (25%) were males. The symptoms seen in them were burning pain, numbness, muscle cramp, pricking pain, muscle weakness, foot ulcer, sensitive to touch and vertigo. Incidence of type 2 diabetes mellitus was higher. Peripheral Neuropathy was also mostly associated with type 2 diabetes mellitus. The most common symptoms seen were numbness and burning pain.

Keywords: diabetes, neuropathy, numbness, burning pain

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INTRODUCTION

Diabetic peripheral neuropathy (DPN) is the most common complication of diabetes mellitus (DM), affecting as many as 50% of patients of diabetic irrespective of its types. DPN is manifested with the symptoms or signs of peripheral nerve dysfunction. These symptoms may vary from patients to patients and usually involve tingling sensation, numbness, unusual sensations, weakness or burning pain in the affected area. Often times, the symptoms are symmetrical and involve both hands and feet. Because the symptoms are often present in the areas covered by gloves or stockings, peripheral neuropathy is often described as having a "glove and stocking" distribution of symptoms [1]. The nerve damaging sign in peripheral neuropathy is caused by chronically high blood sugar and diabetes mellitus condition. Chronically high blood sugar levels damage nerves not only in the extremities but also in other parts of the body. These damaged nerves cannot effectively carry messages between the brain and other parts of the body. DPN is appearing to be more common in people who have problems controlling their blood glucose, as well as those with high levels of blood fat and overweight. DPN can involve all nerve types' namely motor, sensory and autonomic nerves.

Symptoms of DPN varies depending upon the type of neuropathy and nerves that are affected. It can be even asymptomatic in some affected individuals. As the symptoms are often minor at first and most nerve damage occurs over several years, mild cases may go unnoticed for a long time. It is often initiated with numbness, tingling, or pain in the feet or hands. Severity might be associated with wasting of the muscles of the feet or hands, indigestion, nausea or vomiting, diarrhea or constipation, dizziness or faintness due to a drop in blood pressure after standing or sitting up, problems with urination, erectile dysfunction in men or vaginal dryness in women. Symptoms that are not due to neuropathy but often accompany it include weight loss and depression. In some affected individuals, mainly those with focal neuropathy, the onset of pain may be sudden and severe. The prevalence of neuropathy increased with increase in age and duration of diabetes mellitus condition.

MATERIALS AND METHODS

This retrospective study involved study of medical records of diabetic (both type 1 and type 2) patients visited to a tertiary care hospital of South India. Relevant information was collected in the form of proforma and evaluated. Accordingly, 42 medical records belonging to diabetic patients were evaluated. The categorization of type 1 and type II diabetes mellitus was done together with gender categorization. Patients with diagnosis of diabetic neuropathy were noted separately. Various symptoms of neuropathy have been studied and noted in the form of data. The data were compiled in terms of percentage.

RESULTS

Out of 42 diabetic subjects, 25 (60%) of them were female and remaining 17 (40%) were males (Graph 1). This confirms the female dominance of gender in DM. Among the 25 female diabetic subjects, 23 (92%) of them had type 2 variety while remaining two subjects (8%) were suffering from type 1 DM. Whereas all male (17) subjects were reported to be type 2 DM (Graph 1). Amongst 42 confirmed cases of DM, 12 (29%) patients were also diagnosed with peripheral neuropathy symptoms. Upon gender classification, it has been noted that, 9 (75%) out of 12 were females while remaining 3 (25%) of them were males (Graph 2). Various symptoms associated with DPN when analyzed, it has been noted that, prevalence of burning pain sensation (3 cases) and numbness (3 cases) were higher, followed by muscle cramp (2 cases) symptoms. Pricking type of pain, muscle weakness, foot ulcer, sensitive to touch and vertigo cases was also noticed (Table 1).

Symptoms associated with diabetic neuropathy patients	Number of cases
Burning pain	3
Numbness	3
Muscle cramp & weakness	2
Prickling pain	1
Foot ulcer	1
Sensitive to touch	1
Vertigo	1

Table 1- Prevalence of various symptoms associated with diabetic neuropathies

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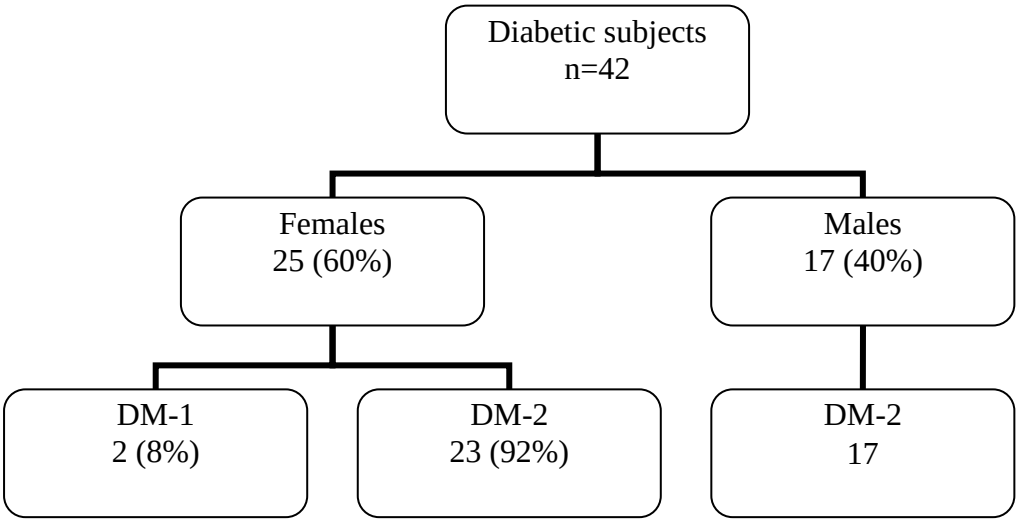
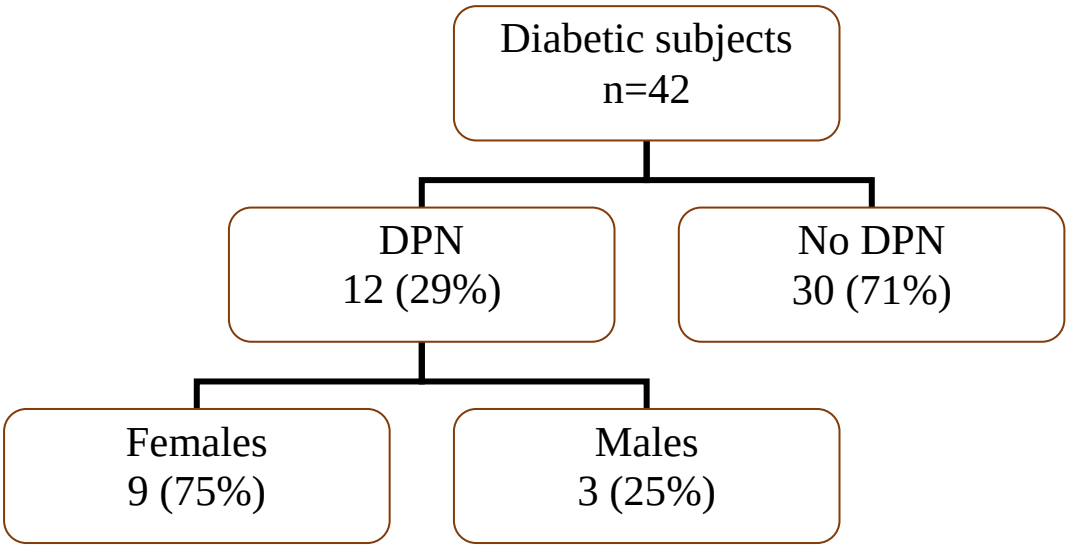


Graph 1: Hierarchical relationship of diabetes subjects to gender and type of diabetes mellitus. DM-1: Type 1 diabetes mellitus; DM-2: Type 2 diabetes mellitus



Graph 2- Prevalence of Diabetic peripheral neuropathy (DPN) and gender profile of diabetes mellitus subjects

DISCUSSION

In the present study, we detected a high frequency of diabetic peripheral neuropathy (DPN) in patients with type 2 diabetes mellitus (T2DM). DPN was independently associated with increasing age and duration of symptoms of diabetes prior to diagnosis. Previous studies have identified several risk factors for DPN such as age, poor glycemic control, increasing duration of diabetes, gender, height, body mass index, retinopathy, hypertension, smoking, and alcohol consumption [2-5]. The prevalence of DPN increased with longer pre-diabetic period, as reflected by duration of symptoms attributable to diabetes [6]. While some earlier studies have also reported similar findings, these have not been confirmed by others [7-9]. The estimates of DPN prevalence vary widely from 9.6 to 78% in different populations. This could be attributed to different types of diabetes (e.g. type 1 and type 2 diabetes), genetic predisposition, age of onset of diabetes, existing healthcare facilities, sample selection, different diagnostic criteria used (pin-prick perception, clinical signs and symptoms, and quantitative sensory tests or electro diagnostic tests) [10].

In the present study, prevalence of DPN was found to be 29%. Out of which 75% were female and 25% were male suffering from DPN. The lower prevalence in the present study could possibly be because of a

different study set-up (tertiary care vs. community based), increased knowledge and awareness of diabetes and its complications in recent times leading to earlier type 2 diabetes mellitus diagnosis and control of its complications. The present study does not come in line with that of Raman et al., which was carried out in 248 T2DM patients reporting DPN prevalence to be 10.5% [11]. One of the studies observed there were no sex differences in the development of DPN, with equal likelihood for males and females [12]. But, we observed the higher prevalence of T2DM as well as DPN among females in comparison with males. The higher prevalence of DPN among females than males might be due to their physiological differences and resulting deficiency of nutrients like vitamin B6 required for proper functioning of nerves.

CONCLUSION

In this study, our results suggest that T2DM is the most common compared to T1DM and females are more prone to develop diabetes mellitus and diabetic peripheral neuropathy compared to males. The most common symptoms of peripheral neuropathy seem to those related to numbness followed by burning pain and other symptoms of peripheral neuropathy. Gender related prevalence of DPN was very conspicuous from our study as females were more prone to it. Further studies including a larger sample size should be carried out to assess the sex difference in the development of DPN.

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