International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Characteristics of Patients with Pain Diabetic Peripheral Neuropathy

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Abstract

Background: Diabetic Peripheral Neuropathy pain is one of the symptoms of NPD, a complication most commonly experienced by patients with diabetes mellitus (DM). Painful Diabetic Neurophaty (PDN) is one of the subtypes of peripheral neuropathy and is classified as chronic peripheral neuropathy. The prevalence of PDN reaches 50% of all DM patients. This is a high number considering the disease burden of PDN is very heavy compared to other complications in diabetes.

Objective: To determine the characteristics of patients who experience diabetic peripheral neuropathy pain.

Methods: This type of research is a quantitative study with a descriptive analysis design. The population in the study were all patients who experienced pain complaints with a medical diagnosis of diabetic peripheral neuropathy. The sample in this study amounted to 36 with total sampling technique. The analysis method used is univariate analysis to see frequency distribution. Data were analyzed using SPSS software.

Results: The results showed that female gender experienced more diabetic peripheral neuropathy pain there were 22 respondents (66.11%), age 56-65 years there were 16 respondents (44.44%), long suffering from DM 5-10 years there were 15 respondents (41.67%), the use of DM oral drugs there were respondents (52.78%) and light activity with 29 respondents (80.56%).

Conclusion: The characteristics of patients who experience diabetic peripheral neuropathy pain are female gender, age> 50 years, with a duration of DM> 5 years, using oral type DM drugs and in their daily lives only doing light activities. The important role of health workers in providing education to patients about the symptoms of diabetic peripheral neuropathy to prevent further complications.

Keywords: Characteristics, Diabetic Peripheral Neuropathy, Pain

INTRODUCTION

The International Diabetes Federation (IDF) in 2019 found that there were about 463 million cases of DM in the world and continued to increase in 2021 to 537 million people with DM in the world (1). Indonesia is the 7th country in the world with a large number of DM patients reaching 10.7 million and ranked 3rd in Southeast Asia with 11.3% (2). One of the chronic complications of DM is Diabetic Peripheral Neuropathy (NPD).

Diabetic Peripheral Neuropathy (NPD) is a group of diseases that affect all types of nerves including peripheral (sensory-motor), spinal autonomic nerves. The abnormalities appear clinically diverse and depend on the location of the affected nerve cells. NPD can occur as symmetric sensory-motor axonal neuropathy, proximal asymmetric motor neuropathy, mononeuropathy, and autonomic neuropathy, the

latter mainly through small fiber involvement. Pathophysiology is characterized by metabolic/inflammatory damage affecting peripheral nerves responsible for conducting motor and sensory impulses (3). The process of NPD involves vascular abnormalities. Research has shown that prolonged hyperglycemia stimulates the formation of oxidative free radicals (Reactive Oxygen Species). These free radicals damage the vascular endothelium and neutralize Nitric Oxide (NO), causing microvascular vasodilation to be inhibited. Endothelial dysfunction occurs which results in reduced nerve blood flow resulting in endoneural hypoxia. Various other metabolic factors including Advance Glycosylation End Products (AGEs) also play a role in the occurrence of capillary damage and inhibit axonal transfer so that axon degeneration eventually occurs. All of this occurs due to microvascular damage that inhibits the transport of nutrients and oxygen to the nerves (4).

The prevalence of NPD worldwide is 66% and in Indonesia it is 58%, which is the highest rate in Southeast Asia, such as Malaysia (54.3%) (5). Painful diabetic neurophaty (PDN) is one of the subtypes of peripheral neuropathy and is classified as chronic peripheral neuropathy. The prevalence of PDN reaches 50% of all DM patients. This is a high number considering the disease burden of PDN is very heavy compared to other complications in diabetes (6). Symptoms of PDN include spontaneous intractable pain that is diffuse and continuous and may last for a period of weeks to months. PDN is associated with high mortality and poor prognosis (7).

Seeing the above phenomenon and the results of the research conducted by the researcher, the researcher is interested in conducting a study to see the description of the characteristics of patients who experience NPD pain and see the existing phenomenon that the delay in recognizing early symptoms of NPD will cause further complications such as diabetic ulcers.

OBJECTIVE

This study aims to determine the characteristics of patients who experience Diabetic Peripheral Neuropathy pain.

METHODS

This study used a descriptive analysis design. This study focuses on specific samples that meet the predetermined inclusion and exclusion criteria. The sampling process was carried out at the internal medicine clinic of H Hanafie Muara Bungo Jambi Hospital. This study involved a total sample of 36 respondents. The research sample was NPD patients who experienced pain, medical diagnosis of NPD and received anti-pain medication. The data collection process used a validated and reliable questionnaire as a measurement instrument. The data analysis process used SPSS 23. Researchers used the univariate analysis method to see the frequency distribution of each variable being studied.

The research was conducted for one month, namely May 2024. The statistical analysis used in this study consists of univariate analysis that displays frequency distribution.

RESULT

Table 1 Characteristics of respondents (n=36)

Characteristics	f	%
Gender		
Male	14	38.89
Female	22	61.11

Age		
26-35 years	0	0.00
36-45 years	1	2.78
46-55 years	15	41.67
56-65 years	16	44.44
> 65 years	4	11.11
Duration of DM		
< 5 years	2	5.55
5-10 years	15	41.67
11-15 years	13	36.11
> 15 years	6	16.67
Drug Usage		
Oral	19	52.78
Injection	17	47.22
Physical Activity		
Light	29	80.56
Moderate	7	19.44
Heavy	0	0.00

Table 1 presents the characteristics of the respondents. This study involved 36 patients consisting of 14 men (38.89%) and 22 women (61.11%). Almost half of the respondents were aged 56-65 years (44.44%) and suffered from DM for 5-10 years (41.67%). Most of the respondents used oral medication (52.78%). Almost all respondents did light physical activity (80.56%).

DISCUSSION

In this study, it is known that NPD respondents are more common at the age of > 50 years. This is in line with the research of Mawaddah et all., (2022) and Abdissa et all., (2020) which explained that the age of respondents who experienced NPD was above 40 years. Independent risk factors that are significantly associated with Neuropathic Diabetic Pain are age, weight and peripheral arterial disease (8). As age increases, the risk of neuropathic complications increases. This is because old age is associated with the accumulation of free radical damage such as increased lipid peroxide levels and changes in enzyme activity which ends with tissue damage in old age (9).

Responden perempuan mendominasi pada penelitian ini. Perempuan memiliki risiko lebih tinggi menderita komplikasi neuropati berkaitan dengan paritas dan kehamilan, di mana keduanya ialah faktor risiko terjadinya penyakit DM (10). Neuropathy complications in people with diabetes are more common in women (11). This is also in line with research Amelia et al., (2019), that women suffer more from NPD than men due to high levels of the hormone estrogen which can interfere with the absorption of iodine which helps in the formation of nerve myelin resulting in sensory disturbances in the form of pain. In addition, women are more likely to experience NPD pain due to a large body mass index and irregular menstrual cycles which result in hormonal disturbances so that the accumulation of internal fat which results in inhibition of glucose removal in the blood (12).

The duration of DM in this study was mostly > 5 years. The duration of DM is strongly related to the progressivity of NPD. The glycation process of lipids and proteins causes an increase in AGE. When AGE is formed, it will bind to specific cellular receptors, namely the Advance Glycation End Product (RAGE)

Receptor which will increase ROS (Reactive Oxigen Species) through activation of NADPH oxidase which damages the endothelium resulting in microangiopathy and nerve dysfunction which causes pain or slowing of nerve conduction (7).

Respondents in the study had more light physical activity. This is because some of the occupations of female patients are housewives and retirees in men and have a habit of rarely exercising. This is closely related to the lack of physical exercise causing the accumulation of glucose in the body tissues. Physical activity risk factors also play a role in the incidence of NPD in type 2 DM patients (13). Type II DM patients with low physical activity patterns are at risk of suffering from NPD with adequate physical activity patterns (14).

CONCLUSIONS

The results showed that the characteristics of patients who experience Diabetic Peripheral Neuropathy pain are female gender, age> 50 years, with a duration of DM> 5 years, using oral type DM drugs and in their daily lives only doing light activities. The important role of health workers in providing education to patients about the symptoms of Diabetic Peripheral Neuropathy (NPD) to prevent further complications.

CONFLICT OF INTEREST

The authors declare no potential conflicts of interest in connection with the research, authorship and/or publication of this article.

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