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Prevalência e fatores associados à neuropatia periférica em indivíduos com diabetes mellitus

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Prevalencia y factores asociados con la neuropatía periférica en individuos con diabetes mellitus

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ABSTRACT

Objective: To estimate the prevalence of polyneuropathy (PND) in type 2 diabetic individuals assisted at the Center for Health Hiperdia in Viçosa and to identify factors associated with a positive diagnosis of PND through the score of neuropathic symptoms and susceptibility testing. **Methods:** Cross-sectional quantitative study performed from December 2013 to June 2014, through secondary source. The prevalence of PND and its association with each variable was assessed using the chi-square test and the Fisher exact test. In the logistic regression it was used the method of disposal backward by the Wald test. **Results:** It was found the prevalence of PND: 36.89%, higher in males, in patients with delayed diagnosis of diabetes mellitus (DM) and with the absence of protective sensation plant (SPP). **Conclusion:** The study found a high prevalence of PND, reinforcing the need for early diagnosis in order to prevent ulcers and improving the quality of life of diabetic patients.

Descriptors: Diabetic Neuropathies, Risk Factors, Diabetes Mellitus, Nursing.

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RESUMO

Objetivo: Estimar a prevalência da polineuropatia (PND) em indivíduos diabéticos tipo 2 assistidos no Centro de Atenção à Saúde Hiperdia, em Viçosa/MG e identificar fatores associados ao diagnóstico positivo da PND através do escore de sintomas neuropáticos e testes de sensibilidade. **Métodos:** Estudo quantitativo transversal realizado de dezembro de 2013 a junho de 2014, através de fonte secundária. A prevalência da PND e sua associação com cada variável foi avaliada pelo teste *Qui-quadrado de Pearson* e o Teste Exato de *Fischer*. Na regressão logística utilizou-se o método de eliminação *backward* pelo teste de Wald. **Resultados:** Verificou-se a prevalência de PND: 36,89%, sendo maior em indivíduos do sexo masculino, em indivíduos com maior tempo de diagnóstico do Diabetes *Mellitus* (DM) e ausência de sensibilidade protetora plantar (SPP). **Conclusão:** O estudo detectou uma alta prevalência de PND, reforçando a necessidade do diagnóstico precoce, a fim de prevenir ulcerações, melhorando a qualidade de vida dos indivíduos diabéticos. **Descritores:** Neuropatias Diabéticas, Fatores de Risco, Diabetes Mellitus, Enfermagem.

RESUMEN

Objetivo: Estimar la prevalencia de polineuropatía (PND) en el tipo 2 individuos diabéticos atendidos en el Centro de Salud Hiperdia en Viçosa e identificar los factores asociados con un diagnóstico positivo del PND a través de la puntuación de los síntomas neuropáticos y las pruebas de sensibilidad. **Métodos:** Estudio cuantitativo transversal realizado desde diciembre 2013 hasta junio 2014, a través de fuentes secundarias. La prevalencia de PND y su asociación con cada variable se evaluó mediante la prueba de chi-cuadrado y la prueba exacta de Fisher. La regresión logística se utilizó el método de eliminación hacia atrás mediante la prueba de Wald. **Resultados:** Se encontró que la prevalencia del PND: 36.89%, mayor en los hombres, en los pacientes con diagnóstico tardío de la diabetes mellitus (DM) y la ausencia de plantas sensación protectora (SPP). **Conclusión:** El estudio encontró una alta prevalencia de PND, lo que refuerza la necesidad de un diagnóstico precoz para prevenir las úlceras, la mejora de la calidad de vida de los pacientes diabéticos. **Descriptores:** Neuropatías Diabéticas, Factores de Riesgo, Diabetes Mellitus, Enfermería.

INTRODUCTION

Currently, diabetes mellitus (DM) can be considered an epidemic of global proportions, being characterized as a serious public health problem, both because of the number of people affected, as the complications and disabilities it causes. Diabetes mellitus is a metabolic disorder of multiple etiology characterized by chronic hyperglycemia resulting from impaired production and/or utilization of insulin. The disease can be classified into two major groups: type 1 diabetes, autoimmune or idiopathic in nature and type 2 diabetes, which is characterized by defective insulin secretion and action.[1-2]

In general, the DM is asymptomatic in the early stages, which may delay the diagnosis for years, increasing the risk of chronic complications in the long run, cause malfunctions, damage and failure of various organs due to microvascular, macrovascular and neuropathic changes.[2] Among the late complications of diabetes, the group of diseases included as Diabetic Neuropathies (DN) is what more affects organs or systems. The DN are among the most common complications of diabetes, cover a broad and heterogeneous framework of clinical and subclinical syndromes and are characterized by a progressive loss of nerve fibers affecting both major divisions of the peripheral nervous system, somatic and autonomic.[3]

The DN involves multifactorial conditions and various processes in its pathogenesis, such as metabolic disorders, autoimmune lesions, inflammatory, vascular and neural growth deficiency. The most common forms are generalized symmetric, such as polyneuropathy chronic sensorimotor (PND) or distal symmetric and autonomic. Currently, PND, also called peripheral neuropathy is the most common form and present in 90% of cases, which evolves with or without symptoms or deformity, Usually affecting subjects with DM for over 10 years. However, it may be present at different times during the course of the disease.[3]

The prevalence of DN is high with the evolution of DM coming usually at a frequency of 50% of neuropathic injury in different groups of individuals analyzed in the national and international levels. However, this prevalence may significantly increase when using diagnostic methods of greater sensitivity, such as electrophysiological.[4] Epidemiological data in the literature on the DN are inefficient due to several factors such as inconsistent definitions, bad design of investigations and failure to exclude neurological diseases nondiabetic. Previous research report a worldwide prevalence of 22.7% to 54% for the NDP and European clinical studies show a similarity in prevalence, ranging from 22% to 29%.[5]

Typically, neuropathic symptoms range from severe painful positive symptoms such as burning or blazing sensations, stabbing and acute pain, uncomfortable sensations of temperature, paresthesia and hyperesthesia; the mild symptoms or "negative", such as decreased pain sensation, fatigue and numbness. Symptoms alternate throughout the day and are extremely uncomfortable and painful night.[3]

DN is the most important factor for the onset of ulcers in the lower limbs and may be present before the detection of the loss of protective sensation plant (SPP), resulting in increased vulnerability to trauma, besides causing an increased ulceration risk sevenfold.[6]

The PND can be easily diagnosed in the community centers and basic health units, and hospital outpatient clinics or specialized centers for the treatment of DM, through a simple neurological examination of the feet. In addition, there are several tests that can predict the risk of future ulcerations in patients with DM. However, despite the availability of simple tests and multiplicity accurate assessment tests, we perceive in everyday health services late diagnosis of DN, increasing the micro and macrovascular impairment, which results in high morbidity and mortality,

significantly impairing the quality of life of individuals by disability and decreased survival.[4]

Based on these, the questions that guided the research emerged: the diabetic patients assisted at the Health Care Center in the city where the study was conducted have the positive diagnosis for PND? Which risk factors they present and that may be related to the PND?

From these considerations, it was aimed to estimate the prevalence of PND in diabetic type 2 individuals assisted in Hiperdia Health Attention Center in Viçosa/MG and identify factors associated with a positive diagnosis of PND through the score of neuropathic symptoms and testing sensibility.

METHODS

This study was drawn from the actions related to the extension project interface with research entitled: "Health promotion and disease prevention in skin lesions in diabetic patients in the Health Care Center (Hiperdia), Viçosa, MG: a proposal for dialogue between extension and research." This is a cross-sectional quantitative study, conducted at the Center for Hiperdia Health, from March to December 2014.

The Hiperdia Health Attention Center is characterized as a place of medium complexity reference, whose management is carried out by the Municipal Health and is designed to care for people diagnosed with systemic arterial hypertension (HAS) and DM referenced by nine municipalities that make up the micro-region of Viçosa/MG. The patient care is performed by a multidisciplinary team of nurses, psychologist, social worker, nutritionist, doctor and pharmacist, which promote actions of treatment, disease prevention and rehabilitation with the audience attended the service.

Persons diagnosed with DM are referred from the primary health care units to the center according to the following criteria: be diagnosed with diabetes type 1 or 2; in use of insulin or oral antidiabetic at full dose with poor metabolic control; people with newly diagnosed DM indicated for insulinization and diabetes type 1 or 2 with Changes in plantar foot protection sensitivity.

Included in this study were individuals over the age of 18 who were referred to the Hiperdia Health Care Center, according to the above criteria, diagnosed with type 2 diabetes who underwent its first evaluation of the feet in the period December 2013 to May 2014, were excluding diabetic patients with type 1 or those who refused to participate. The sample comprised 103 individuals.

Data collection was conducted from a secondary source. Individuals diagnosed with diabetes perform the first assessment of the feet by completing a so-called instrument of "screening" which is attached to the patients' medical records[3]. The screening consists of demographic, clinical and lifestyle (gender, age, race, marital status, education, type of DM, year of diagnosis of diabetes, presence of hypertension, insulin use, glycohemoglobin, dyslipidemia, previous ulcer , obesity, smoking or drinking), clinical evaluation of the feet, neuropathic tests and the ankle-brachial index (ITB).

The data were recorded in a form built for this purpose and later entered and analyzed in the Epiinfo 7.0 program.

The descriptive analysis of qualitative variables was presented in absolute and relative frequency tables. It calculated the prevalence of PND and its association with each explanatory variable was determined by Pearson's chi-square test and Fisher's exact test when the expected number in one of the houses was less than 5.

The association between the presence PND and the explanatory variables were taken from the multiple logistic regression model. In the model variables with p <0.20 in the univariate analysis and the final model the variables with p <0.05. All analyzes were performed in Epiinfo 7.0 program.

Considering the objectives of this research for the selection of the final model of logistic regression was used the method of disposal backward by the Wald test. This method began with the inclusion of all the explanatory variables and significant (p <0.20 in the univariate analysis) in the model. Variables were then removed one at a time, beginning with the one presenting the least significant to the model (greater p value). The equation was assessed in each step and the procedure repeated until each variable that remained in the model to explain a significant proportion of the observed variation in the response variable.

The study was approved by the Ethics Committee on Human Research of the Federal University of Viçosa (UFV) by opinion No. 663,169, according to the ethical guidelines for research involving human beings, according to Resolution No. 466/12 of the National Council of Health. We requested permission to carry out this study to Hiperdia management.

RESULTS

103 screenings were analyzed and resulted in a sample of predominantly women (58.25%), aged between 32 and 59 years (41.75%), white (44.66%), married (64.07%) and complete or incomplete primary education (66.01%). The majority of subjects were hypertensive (82.52%) and only 45.63% practiced physical activity. 79.61% had changed glycohemoglobin values, 38.83% were obese, 15.53% had Peripheral Artery Disease (PAD) and 30.10% had a history of prior ulcer. Alcohol consumption and smoking were observed in 12.62% and 9.71% of cases, respectively. The total sample consisted of DM type 2 individuals, and 36.90% made use of insulin. The median time from diagnosis of diabetes was 10.6 years (DP: 9.0). Regarding the plantar sensitivity test with monofilament, loss of sensitivity was recorded in approximately 22.33% of the subjects. The prevalence of PND was 36.89% (Table 1 and 2).

Table 1 - Sociodemographic characteristics and modifiable risk factors of people diagnosed with type 2 diabetes accompanied by Hiperdia Health Care Center. Viçosa/MG, 2013-2014

Variable	N	Frequency (%)
Socio-Demographic data		
Gender		
Male	43	41.75%
Female	60	58.25%
Age Range		
32 – 59 years old	43	41.75%
60 – 69 years old	42	40.78%
70 – 82 years old	18	17.47%
Race		
Black	25	24.28%
Brown	29	28.15%
White	46	44.66%
No information	03	02.91%
Marital Status		
Single	11	10.68%
Married/Stable Union	66	64.07%
Divorced	11	10.68%
Widowed	14	13.60%
No information	1	0.97%
Education		
Illiterate	19	18.45%
Complete or incomplete primary education	68	66.01%
High School or more	13	12.63%
No information	03	2.91%
Modifiable factors		
Physical activity		
Yes	47	45.63%
No	56	54.37%
Alcoholic		
Yes	13	87.38%
No	90	12.62%
Smoking habits		
Yes	10	9.71%
No	93	90.29%

Table 2 - Clinical characteristics of people diagnosed with type 2 diabetes accompanied by Hiperdia Health Care Center. Viçosa/MG, 2013-2014

Variable	N	Frequency (%)
Insulin use		
Yes	38	36.90%
No	57	55.34%
No information	08	7.76%
Glycohemoglobin		
Greater than or equal to 7	82	79.61%
Less than 7	13	12.62%
No information	08	7.77%
Hypertension		
Yes	85	82.52%
No	18	17.48%
Obesity		
Yes	40	38.83%
No	59	57.28%
No information	04	3.89%
Peripheral Artery Disease		
Yes	16	15.53%
No	87	84.47%
Prior ulcer		
Yes	31	30.10%
No	72	69.90%
DM diagnosis time		
Average (standard deviation)	10.6(9.0)	
Protective Planting Sensitivity		
Present	80	77.67%
Absent	23	22.33%
Polyneuropathy		
Yes	38	36.89%
No	65	63.11%

In the univariate analysis, it was found that four variables were associated with PND, which are: gender, age, SSP and the DM diagnosis time. Among the 38 individuals who had PND, 48.84% were male and 45.24% of the age group between 60-69 years. Regarding the PND, it was found that 23 subjects had an absent sensitivity, and of these, 82.61% presented PND. The average of the DM diagnosis time of the sample who obtained the PND was 14.72 years (SD = 9.65) (Table 3). The variables included in the multivariate analysis were: race, hypertension, obesity and previous ulcer.

Table 3 - PND frequency distribution according to demographic and clinical characteristics of people diagnosed with DM accompanied by Hiperdia Health Care Center, Viçosa/MG, 2013-2014

Variable	Diabetic Neuropathy		p – value
	Yes	No	
Gender			
Male	21 (48.84%)	22 (51.16%)	0.033*
Female	17 (28.33%)	43 (71.67%)	
Age Range			
32 – 59 years old	9 (20.93%)	34 (79.07%)	
60 – 69 years old	19 (45.24%)	23 (54.76%)	0.013*
70 – 82 years old	10 (55.56%)	08 (44.44%)	
Race			
Black	10 (40.00%)	15 (60.00%)	
Brown	07 (24.14%)	22 (75.86%)	0.169*
White	21 (45.65%)	25 (54.35%)	
Marital Status			
Single	05 (45.45%)	06 (54.55%)	0.652
Married/Stable Union	21 (31.82%)	45 (68.18%)	
Divorced	05 (45.45%)	06 (54.55%)	
Widowed	06 (42.86%)	08 (57.14%)	
Education			
Illiterate	06 (31.58%)	13 (68.42%)	0.702
Complete or incomplete primary education	25 (36.76%)	43 (63.24%)	
High School or more	06 (46.15%)	07 (53.85%)	
Physical activity			
Yes	19 (40.43%)	28 (59.57%)	0.496
No	19 (33.93%)	37 (66.07%)	
Alcoholic			
Yes	06 (46.15%)	07 (53.85%)	0.459
No	32 (35.56%)	58 (64.44%)	
Smoking habits			
Yes	08 (80.00%)	02 (20.00%)	0.243
No	36 (38.71%)	57 (61.29%)	
Worker			
Yes	10 (31.25%)	22 (68.75%)	0.475
No	27 (38.57%)	43 (61.43%)	
Insulin use			
Yes	16 (42.11%)	22 (57.89%)	0.218
No	17 (29.82%)	40 (70.18%)	
Glycohemoglobin			
Greater than or equal to 7	05 (38.46%)	08 (61.54%)	0.694
Less than 7	27 (32.93%)	55 (67.07%)	

(To be continued)

(Continuation)

Variable	Diabetic Neuropathy		p – value
	Yes	No	
Hypertension			
Yes	34 (40.00%)	51 (60.00%)	0.187*
No	04 (22.22%)	14 (77.78%)	
Obesity			
Yes	11 (27.50%)	29 (72.50%)	0.178*
No	24 (40.68%)	35 (59.32%)	
Peripheral Artery Disease (DAP)			
Yes	08 (50.00%)	08 (50.00%)	0.237
No	30 (34.48%)	57 (65.52%)	
Prior Ulcer			
Yes	15 (48.39%)	16 (51.61%)	0.112*
No	23 (31.94%)	49 (68.06%)	
Protective Planting Sensitivity (SSP)			
Present	19 (23.75%)	61 (76.25%)	<0.001*
Absent	19 (82.61%)	04 (17.39%)	
Diagnosis time			
Average (standard deviation)	14,72(9.65)	8,19(7.69)	<0.001*

* Variables included in the multivariate analysis (p <0.20).

The multiple logistic regression analysis was used to evaluate the association between PND and several factors: gender, age, race, hypertension, obesity, previous ulcer, time of diagnosis of DM and SPP (Model 1). They remained independently associated with PND sex, the absence and the SPP DM diagnosis time (Model 6). As shown in Table 4.

Table 4 - Odds Ratio and 95% confidence interval of the relation between the presence of ND and clinical, sociodemographic and modifiable factors. Viçosa/MG, 2013-2014

Characteristics	Model 1 OR (IC 95%)	Model 2 OR (IC 95%)	Model3 OR (IC95%)	Model 4 OR (IC95%)	Model 5 OR (IC95%)	Model 6 OR (IC 95%)
Gender						
Male	5 (0.89-14.28)	3.44 (0.89-14.28)	3.86 (1.05-14.28)	3.84 (1.06-14.28)	3.44 (1.0-12.5)	3.70 (1.13-12.5)
Female	1	1	1	1	1	1
Age Range						
32-59	1	1	1	-	-	-
60-69	2.17 (0.52-9.04)	2.15 (0.56-8.26)	2.23 (0.59-8.39)	-	-	-
70 or +	2.36 (0.45-12.14)	2.33 (0.48-11.26)	2.24 (0.45-11.02)	-	-	-
Race						
Black	1	1	1	1	1	-
Brown	0.20 (0.04-0.98)	0.20 (0.04-0.98)	0.21 (0.04-1.0)	0.25 (0.05-1.17)	0.29 (0.06-1.33)	-
White	0.84 (0.24-2.92)	0.84 (0.24-2.91)	0.83 (0.24-2.89)	0.85 (0.25-2.92)	0.83 (0.24-2.82)	-
Hypertension						
Yes	0.97 (0.20-4.57)	-	-	-	-	-
No	1	-	-	-	-	-
Obesity						
Yes	0.95 (0.28-3.18)	0.94 (0.29-3.05)	-	-	-	-
No	1	1	-	-	-	-
Prior Ulcer						
Yes	2.08 (0.58-7.42)	2.08 (0.58-7.41)	2.23 (0.62-7.93)	2.34 (0.68-8.04)	-	-
No	1	1	1	1	-	-
DM diagnosis time						
In years	1.10 (1.03-1.19)	1.10 (1.03-1.19)	1.11 (1.03-1.19)	1.12 (1.05-1.20)	1.12 (1.05-1.20)	1.13(1.06-1.21)
Protective Planting Sensitivity (SSP)						
Yes	1	1	1	1	1	1
No	9.84 (2.31-41.81)	9.82 (2.32-41.46)	11.23 (2.71-46.53)	11.90 (2.99-47.26)	13.39 (3.50-51.15)	11.96 (3.28-43.59)
Log-Likelihood	83.0045	83.0056	84.1972	85.8785	87.7334	91.3769
Included cases	96	96	100	100	100	103

DISCUSSION

PND neuropathy is the main cause inherent to foot ulceration in the diabetic individual. One of the earliest symptoms is the loss of normal foot sweating, which results in skin dryness and cracking risk. Ulcerations in diabetic feet affect about 85% of lower limb amputations of extremities. In this context, the PND screening becomes as important as the detection of other chronic complications of DM.[7-8]

The PND reaches high levels in diabetics. Their presence ranges from 13% to 47%, both in population studies and in outpatients; already hospitalized patients ranges from 19% to 50%.[9] In this research, the prevalence of PND was 36.89%. The result is consistent with other studies, such as the one conducted in caucasian populations in which the prevalence of PND in type 2 diabetic patients ranged widely between 10% and 48%.[10] This variation was due to several factors, such

as different methods used for the PND detection, as well as the variability in age and time elapsed before diagnosis. Two studies conducted in Spain reported a prevalence of 22.7% and 39.6% and the prevalence of PND was reported in 31.9% of 124 diabetic patients studied in Iran.[5]

The average of DM diagnosis time in those who experienced PND was 14.72 years, with one year at this time represents a 13% increase in the chance of developing the PND. The duration of diabetes is an important risk factor for injury in the lower limbs. This factor may have contributed to the high prevalence of PND found in the sample. A descriptive cross-sectional study in a research and extension center in the interior with a sample of 55 diabetic patients found that 40% of these had the DM diagnosis time between 6 and 10 years with an average of 9.7 years. The longer the time of diagnosis of diabetes, the more likely to develop PND and foot ulcers; however, every diabetic individual with any time of diagnosis should be screened for risk factors for foot problems.[11-12]

The gender most affected by the PND was male (48.84%). The study also revealed that men have a 3.7 times greater chance of presenting PND than women. In a survey conducted in Mexico, 71.7% of the sample men had PND.[13] Ulcers, amputations, neuropathy and peripheral vascular disease are more common in men, being male risk 1.6 times more likely to suffer amputations in relation to women. This is because women are more concerned with self-care than men.[14-15]

The test monofilament is standardized to identify the loss of protective sensation of the foot, by detecting changes in the sensation of touch and proprioception. It was advised as test of choice in the ratings by non-specialists to determine an increased risk of ulceration by the advantages of high sensitivity, good specificity, simplicity, and low cost. Of the patients studied, 23 had the feeling of impaired monofilament. This finding is due to the fact that the monofilament used (10g) is suitable for clinical evaluation of foot ulceration risk, but not as a sensitive mean to detect the prevalence of neuropathy. However, the absence of plantar sensitivity in individuals took a chance of approximately 12 times to provide PND. Of the individuals who presented altered sensitivity, 82.61% had PND.[10-14-16]

The severity of the PND, often in diabetics is related to many factors beyond the duration of illness, sex and SPP. Life habits of individuals can aggravate the progression of the disease process. Previous studies have identified age, poor glycemic control, weight, hypertension, smoking and alcohol consumption as important factors in the progression of PND.[10-5]

Of individuals analyzed, the most affected age group was 60-69 years, and of these 45.24% had PND. A cross-sectional study in China showed that the prevalence of PND increased with age, in those ≥ 65 years the prevalence was 42.4%. Studies report that for every ten years of age, the PND prevalence increases significantly, and after 60 years the incidence was 1.7 times higher than those aged less.[10-17]

The lack of glycemic control was not a significant factor in this study. Individuals with glycohemoglobin (HbA1c), as amended, 38.46% had PND. Previous research has also showed no association between HbA1c and changed the PND. This is due to the fact that 65% of those already analyzed being treated at the time of examination.[5-17]

Obesity has reached 27.50% of subjects and was not considered an associated risk factor. However, it is known that obesity increases insulin resistance and glucose intolerance, exacerbating metabolic abnormalities in type 2 diabetes, increasing cardiovascular risk.[14]

In the present study 82.52% were hypertensive individuals and 40% of these showed PND. Hypertension was present in 10.2% of the sample in a survey conducted in Paraná, where hypertension was twice as common in diabetic patients compared to the general population and this rate increased with age, in addition to increasing the chances of developing macro and microvascular complications.[18]

Previous studies have reported that smoking and alcohol consumption are associated with PND. In the analyzed sample, there was no correlation between smoking, drinking and neuropathy. Of individuals in the sample, 80% were smokers and had PND. It should be noted that smoking is related to the decrease in sensitivity in the lower limbs. Nicotine triggers adrenergic responses that raise glucose values by suppressing the production of insulin. With regard to alcohol consumption, 46.15% of alcoholic individuals had the PND. Studies show that drinking alcohol produces an intermediate level of metabolic changes that favors the appearance of axonal transport dysfunction that ends up in PND.[14]

A NDP has a big impact on the lives of individuals if not detected early. It is important to follow-up by a multidisciplinary team, highlighting the work of nurses in health education, giving priority to activities related to its role as an educator, that favors the involvement of the individual in self-care activities, especially when presenting knowledge deficit and ability to take care of yourself.[19] Nursing professionals must take a health educator role, developing actions for risk prevention, clinical monitoring, control of the disease and its complications, stimulating autonomy for self-care.

From these considerations, it is essential that neuropathy is identified early on, and that prevention is strengthened, as well as the clinical aspects of the disease, seeking to avoid the complications that carry high financial costs and decrease in the quality of life of the individuals affected..

Despite the importance of data, some limitations of the study are took up, as the data collection was a secondary source, occurring loss of data due to errors in the completion and lack of information. Moreover, the lack of current theoretical framework on PND and its risk factors hindered the development of the discussion guided by research in this area. But even with the limitations,

the methodology allowed to find results and achieve the objectives proposed by the study.

CONCLUSIONS

This study found a high prevalence of PND, present in 36.89% of diabetic type 2 individuals monitored by the Hiperdia Health Care Center, Viçosa/MG. The risk factors significantly associated with PND were gender, DM diagnosis time and absence of SPP. Early diagnosis of PND becomes necessary to prevent ulceration, improving the quality of life for diabetic individuals. Noteworthy is the role of nursing to conduct regular evaluation of feet in detail, as well as develop educational activities aimed at improving self-care.

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