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EPIDEMIOLOGICAL PROFILE OFPATIENTS WITH AMPUTATION DUE TODIABETIC FOOT

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ABSTRACT

Objective: To characterize the clinical profile of patients with diabetic foot amputation. **Materials andMethods:** Exploratory, descriptive study, with a quantitative approach, carried out in a public hospital in Campina Grande - PB, with a sample of 208 medical records of patients with amputation due to diabetic foot. Descriptive statistics of relative and absolute frequency, Pearson's Chi-square association test or Fisher's exact test, Poisson regressions and prevalence ratio were used. **Results:** Male patients, over 61 years old and without occupation, with a glycemic status (during hospitalization) of <200 mg / dL, who had other comorbidities, with Systemic Arterial Hypertension being the most prevalent. Regarding amputation, there were more cases of a first amputation, with a major level, and predominantly in thetransfemoral region. **Conclusion:** Characterizing a prevalent profile for this condition provides health professionals at all levels of care, subsidies for carrying out preventive actions, as well as an evaluation of the care plan and special attention to these cases in order to avoid complications of this pathology.

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INTRODUCTION

Diabetes Mellitus (DM) is a metabolic disorder of different etiologies, being characterized by hyperglycemia and disturbances in the metabolism of carbohydrates, proteins and fats, resulting from defects in the secretion and/or action of insulin. It is considered a public health problem, a condition sensitive to Primary Health Care (PHC), since the good management of this problem avoids hospitalizations and deaths (WORLD HEALTH ORGANIZATION, 1999; ALFRADIQUE *et al*., 2009). DM is associated with increased mortality and high risk for the development of micro and macrovascular complications.

It can cause blindness, renal failure and limb amputations, which results in significant health expenses, in addition to reduced work capacity and life expectancy (BRASIL, 2013). It is noteworthy that the diabetic foot is among the main complications of DM, and its consequences can be dramatic for the individual's life, from chronic wounds and infections to lower limb amputations (AMERICAN DIABETES ASSOCIATION, 2013). Amputations are an important indicator for operationalizing the evaluation of the quality of health care, as they reveal, from the section level and the situation of occurrence, the magnitude of this complication in the three levels of care, the evolution of the disease and the quality of its management. Thus, considering the section level, the amputationsare classified as major, those performed on the

proximal part of the foot, leg, thigh and disarticulation of the hip, while thoseregarded as minor amputations are restricted to the toes or the lower part of the foot (SANTOS *et al*., 2013). Knowing the profile of patients most susceptible to this condition becomes essential for clinical practice, as well as allowing the establishment of strategies and actions for prevention and health promotion through knowledge of this profile. Therefore, the present study aimed to analyze the epidemiological profile of patients with amputation due to diabetic foot.

MATERIALS AND METHODS

This is an exploratory, descriptive study with a quantitative approach, carried out in a public hospital in Campina Grande - PB. The information was collected from medical records of individuals diagnosed with diabetic foot, submitted to the amputation procedure in 2016, with a population consisting of 222 medical records. It was established, as inclusion criteria, medical records of patients aged 18 years or older and, for exclusion, incomplete medical records in relation to sociodemographic data and about amputation, totaling a sample of 208. The variables studied were sociodemographic and clinical data, as well as data about the amputation and the body part of the procedure. The statistical information was obtained through the SPSS program and presented through tables. In addition to descriptive statistics of relative and absolute frequency, Pearson's Chi-square association test or Fisher's exact test was used. For variables that showed an association with statistical significance less than or equal to 15%, that is, $p < 0.15$, Poisson regressions were adopted, with a robust estimator. Exp (B) was considered as a measure of prevalence ratio and $p < 0.05$ was accepted as statistical significance. This study was approved by the Research Ethics Committee of the State University of Paraíba under the CAAE (Certificate of Presentation for Ethical Appreciation) N. 2,281,688.

RESULTS

As shown in Table 1, most patients are male (57.7%), over 60 years old (73.6%) and have no occupation (73%), that is, they are retired. Table 2 indicates that most patients did not use insulin (74.7%), had blood glucose <200 mg / dL (53.7%) during hospitalization, had other comorbidities (68.3%), being Systemic Arterial Hypertension (SAH) the most prevalent (71.6%).

Table 1. Description of the sociodemographic data of patients with amputation due to diabetic foot. Campina Grande - PB, 2017

	Frequency (F)	Percentage (%)
Sex		
Male	120	57.7
Female	88	42.3
Age		
> 60 yearsold	153	73.6
≤ 60 yearsold	55	26.4
Worksituation		
No occupation (retired)	135	73.0
Working	50	27.0

Source: Research data.

Table 3 corresponds to data regarding amputation.It was observed that most patients had a first amputation (76.4%), with higher level (67.3%) andin thetransfemoral region (57.7%). As for the association of sociodemographic data and first amputation or a new amputation, there was no statistically significant association.

Table 2. Description of clinical data contained in medical records of patients assisted in tertiary care. Campina Grande - PB, 2017.

	Frequency (F)	Percentage (%)
Use ofinsuline		
Yes	47	25.3
No	139	74.7
Glycemic State during hospitalization (stored)		
< 200	101	53.7
≥ 200	87	46.3
Presenceofothercomorbidities		
Yes	142	68.3
No	66	31.7
Typesofcomorbidities		
Systemic arterial hypertension	101	71.6
Chronicheartfailure	3	2.1
Twocomorbidities	23	16.3
Threecomorbidities	3	2.1
Other	11	7.8

Source: Research data.

Table 3. Description of data regarding amputation contained in medical records of patients assisted in tertiary care. Campina Grande - PB, 2017

	Frequency (F)	Percentage (%)
Firstamputation		
Yes	159	76.4
No	49	23.6
New amputation		
Yes	39	18.8
No	169	81.3
Reamputation		
Yes	9	4.3
No	199	95.7
Bilateral amputation		
Yes	1	5
No	207	99.5
Levelofamputation		
Major	140	67.3
Minor	68	32.7
Placeofamputation		
Toes	67	32.2
Foot	11	5.3
Transtibial	3	1.4
KneeDesarticulation	7	3.4
Transfemoral	120	57.7

Source: Research data.

However, regarding reamputation, table 4 shows that there was a higher prevalence in males (5.8%), aged less than or equal to 60 years (9.1%) and with occupation (12.0%). As for age and occupation, there was statistical significance, but only occupation remained statistically significant in the regression. Table 5 shows the prevalence of a higher level of amputation in women (75.0%) and individuals older than 60 years (64.5%). However, in the regression model, only age remained with a statistically significant effect. It was also found that women (69.3%), people over 60 years old (67.3%) and those without a job (64.4%) had a higher prevalence of transfemoral amputation. In the multivariate regression model, only sex and age remained statistically significant. Regarding the association of clinical data with the level of amputation and transfemoral amputation, table 6 shows that people with a blood glucose value <200 mg / dL had a higher prevalence of major amputation (74.3%), but with no statistically significant result in the regression.

Table 4. Association between reamputation and sociodemographic data. Campina Grande - PB, 2017

	Reamputation		Sig.	Adjusted PR Sig. (CI 95%)
	No F (%)	Yes F (%)		
Sex				
Male	113 (94.2%)	7 (5.8%)	0.21*	
Female	86 (97.7%)	2 (2.3%)		
Age				
≤ 60yearsold	50 (90.9%)	5 (9.1%)	0.04*	1.02
> 60 yearsold	149 (97.4%)	4 (2.6%)		0.63 (0.93 – 1.18)
Worksituation				
Withoccupation	44 (88.0%)	6 (12.0%)	<0.01†	0,89
Withoutoccupation	133 (98.5%)	2 (1.5%)		0.03 (0.81 – 0.99)

Source: Research data. p *: Chi-square test; p †: Fisher's test. PR: Prevalence ratio; CI: Confidence Interval; Sig.: Statistical significance

Table 5. Association between data regarding amputation and sociodemographic data. Campina Grande - PB, 2017

	Levelofamputation		Sig.*	Adjusted PR Sig. (CI 95%)	TransfemoralAmputation		Sig.*	Adjusted PR Sig. (CI 95%)
	Minor F (%)	Major F (%)			No F (%)	Yes F (%)		
Sex								
Male	46 (38.3)	74 (61.7%)	0.04		61 (50.8%)	59 (49.2%)	<0.01	
Female	22 (25.0)	66 (75.0%)		1.10 0.15 (0.97 – 1.24)	27 (30.7%)	61 (69.3%)		1.10 0.03 (1.01 – 1.20)
Age								
≤ 60 yearsold	29 (52.7)	26 (47.3%)	<0.01		38 (69.1%)	17 (30.9%)	<0.01	
> 60 yearsold	39 (25.5%)	114 (74.5%)		1.29 <0.01 (1.11 – 1.50)	50 (32.7%)	103 (67.3%)		1.22 <0.01 (1.07-1.40)
Worksituation								
Withoccupation	20 (40%)	30 (60.0%)	0.22		29 (58.0%)	21 (42.0%)	<0.01	
Withoutoccupation	41 (30.4)	94 (69.6%)			48 (35.6%)	87 (64.4%)		1.01 0.88 (0.88 – 1.16)

Source: Research data. p *: Chi-square test. PR: Prevalence ratio; CI: Confidence Interval; Sig.: Statistical significance

Table 6. Association between data regarding amputation and clinical data. Campina Grande - PB, 2017

	Levelofamputation		Sig.*	Adjusted PR Sig. (CI 95%)	Transfemoral Amputation		Sig. *	Adjusted PR Sig. (CI 95%)
	Minor F (%)	Major F (%)			No F (%)	Yes F (%)		
Blood glucose duringhospitalization								
≥ 200	37 (42.5%)	50 (57.5%)	0.01	1.09 0.07 (0.99 – 1.21)	48 (55.2%)	39 (44.8%)	<0.01	
< 200	26 (25.7%)	75 (74.3%)			35 (34.7%)	66 (65.3%)		1.16 0.01 (1.03 – 1.30)
Use ofInsuline								
Yes	20 (42.6%)	27 (57.4%)	0.08	1.08 0.24 (0.94 – 1.23)	26 (55.3%)	21 (44.7%)	0,05	
No	40 (28.8%)	99 (71.2%)			54 (38.8%)	85 (61.2%)		1.03 0.69 (0.90 – 1.18)
Othermorbidities								
No	26 (39.4%)	40 (60.6%)	0.16		34 (51.5%)	32 (48.5%)	0.16	
Yes	42 (29.6%)	100 (70.4%)			54 (38.0%)	88 (62.0%)		
Arterial hypertension								
No	10 (25.0%)	30 (75.0%)	0.43		14 (35.0%)	26 (65.0%)	0.70	
Yes	32 (31.7%)	69 (68.3%)			39 (38.6%)	62 (61.4%)		

Source: Research data. p *: Chi-square test. PR: Prevalence ratio; CI: Confidence Interval; Sig.: Statistical significance

It was also found that people with blood glucose <200 mg / dL (65.3%) and those who did not use insulin (61.2%) had a higher prevalence of transfemoral amputation. However, only the glycemic status remained statistically significant in the regression model.

DISCUSSION

This study sought to analyze the epidemiological profile of patients with amputation due to diabetic foot. It was observed that the majority of cases were related to male patients, older than 61 years of age and retired. Regarding the higher occurrence of amputation in male individuals, studies carried out in Brazil corroborate the finding, however, this is not clearly defined in the literature. This fact may be related to the condition of women being more significantly concerned with self-care, in addition to the fact that they tend to seek health services more than men, thus enabling the prevention of risk factors related to amputations resulting from DM (OLIVEIRA *et al*., 2016; TAVARES *et al*., 2009). It is important to highlight that there is a resistance by men to seek help and care for their health needs, as they generally postpone the search for health services, doing so only in more serious situations. The age group above 61 yearsof age represents a factor that compromises the rehabilitation process, since aging provides gradual and inevitable changes in human beings. Thus, elderly diabetics are more fragile and have a two-fold increase in the risk of progression to disability and complications (YOSHIDA; ANDRADE, 2016; CARNEIRO *et al*., 2016). Regarding occupation,was observed a higher proportion of retirees.This data can be explained by the fact that the elderly are increasingly assuming the role of provider, with most of

the family income coming from their retirement earnings, reflecting in few resources to take care of their own health (TAVARES *et al*., 2017). Most patients included in this study did not use insulin.This situation can be explained by the therapeutic difference adopted for the types of DM. In type 2 DM, more prevalent in diabetic individuals, treatment consists of non-medicated measures, mainly changes in lifestyle, supplemented with oral antidiabetic agents. Eventually, one or two doses of basal insulin are adopted, according to the evolution of the disease. The treatment of type 1 DM has non-pharmacological therapy and insulin administration, being prescribed in an intensive regimen, from three to four doses of insulin per day, divided into basal insulin and prandial insulin. It is the form of the disease that usually affects children and adolescentes.However, this age group is not described in the study (BRASIL, 2013). As for the glycemic value, a predominance of a glycemic status value <200 mg / dL was observed. The goal for the treatment of hyperglycemia in adults recommended by the American Diabetes Association is to achieve the following glycemic values: fasting glucose level between 70 to 130 mg / dL and postprandial glucose level below 180 mg / dL. Thus, even though the study presented this most prevalent data, among the values <200 mg / dL, the most recurrent was 174 mg / dL, a value that is very close to the expected limit, a fact that may also be related to the lack of adherence to treatment. As for the presence of other comorbidities, the most representative was SAH.

Individuals with DM usually have high blood pressure, high levels of cholesterol and blood glucose, contributing to an increased risk of cardiovascular complications. The relevance of DM and SAH is highlighted as they are important risk factors for cardiovascular morbidity and represent a challenge for the public health system. Therefore, identifying users who are unable to carry out self-care to maintain DM control can be a strategy to outline measures that minimize the onset of disease complications (CARVALHO FILHA; NOGUEIRA; MEDINA, 2014). Table 3 shows data regarding amputation, with the first amputation being the most prevalent in the study, which corresponds to the major consequence of the diabetic foot problem. Its occurrence can be understood as an indicator of the magnitude of the problem, since the established care was of greater complexity, constituting an indicator of preventive care, for they report the evolution of the disease and its management. The most prevalent amputation level was the highest, mainlytransfemoral amputation, corroborating with previous findings (SILVA *et al*., 2017). It is believedthat this scenario reflects delay in access to medical care and precarious socioeconomic level, causing many cases to be admitted with a clear impossibility of preserving the limb and even attempting revascularization. This finding is worrying, as it directly reflects on the quality of life of these individuals, considering the physical and psychological impact caused by amputation. In addition, higher governmental and institutional costs are needed to assist these patients' health needs (BORTOLETTO *et al*., 2010).

Reamputation corresponds to a new procedure performed on an unhealed extremity and fundamentally of the case when seen by the hospital, reflecting, in all instances, the inadequate control of the diabetic foot. However, it is noted that, compared to other types of amputation, reamputation had a lower prevalence, which may be associated with an improvement in self-care by patients, as well as the assistance offered (SANTOS *et al*., 2013). Therefore, it is important to emphasize how essential actions that support or strengthen treatment adherence behaviors are. These behaviors can be performed at any level of health care, due to the possibility that the characteristics which guide the care, at the respective levels, represent the disease progression. Health education is valid to enable and motivate the practice of adherence, generating autonomy and favoring greater glycemic control and reduction of complications. Thus, the evaluation of people in their self-care skills and adherence behavior can support the evaluation of the care plan and measurement of the intended results (SANTOS *et al*., 2018). Patients who undergo a higher level amputation have a higher risk of subsequent contralateral amputation, indicating the need for a surveillance program. Since, when an amputation is performed, the risk of future ulceration is greatly increased and strict lifelong surveillance is crucial (BRASIL, 2001). A study carried out in Recife is in line with the present research, regarding the glycemic state during the admission of diabetic patients who had their limbs amputated at a higher level. It is noteworthy that poor glycemic control favors the development of complications of DM, increasing the risk of neuropathy, one of the preponderant factors for triggering ulceration, which may lead to a future amputation (SANTOS *et al*., 2015; BRECHOW *et al*., 2013). Healthy habits are the basis of the treatment of DM and have a fundamental importance in glycemic control, in addition to acting in the control of other risk factors. Thus, with the accomplishment of metabolic control, the individual remains asymptomatic and prevents acute and chronic complications, a fact that may not have happened to the individuals in the study, since they were submitted to amputation (BRASIL, 2013).

Conclusion

Amputation becomes a worrying factor in relation to the quality of life of patients with DM. Characterizing a prevalent profile for this condition provides health professionals at all levels of care, subsidies for carrying out preventive actions, as well as evaluation of the care plan and special attention to these cases to avoid complications of this pathology. It is important to highlight that there are few studies that address the impact of DM in terms of the epidemiological profile as well as factors associated with amputation, which are necessary to know the real dimension of the problem, since the results can be used as an indication of the quality of health management and provide information for planning combat strategies.

REFERENCES

ALFRADIQUE ME, BONOLO PF, DOURADO I, COSTA MFL, MACINKO J, MENDONÇA CS *et al*. Internações por condições sensíveis à atenção primária: a construção da lista brasileira como ferramenta para medir o desempenho do sistema de saúde. *Cad Saúde Pública.* 2009; 25(6): 1337-49.

AMERICAN DIABETES ASSOCIATION 2013 [online]. Standards of Medical Care in Diabetes. Diab Care. jan; 36(1): 11-66.

BORTOLETTO MSS, VIUDE DF, HADDAD MCL, KARINO ME. Caracterização dos portadores de diabetes submetidos à amputação de membros inferiores em Londrina, Estado do Paraná. Acta Scientiarum. Health Sciences. 2010; 32(2): 205-213.

BRASIL 2001. Ministério da Saúde [online]. Consenso Internacional sobre Pé Diabético. Brasília: Ministério da Saúde.

BRASIL 2013. Ministério da Saúde [online]. Estratégias para o cuidado da pessoa com doença crônica: diabetes mellitus. Brasília: Ministério da Saúde.

BRECHOW A, SLESACZECK T, MÜNCH D, NANNING T, PAETZOLD H, SCHWANEBECK U *et al*. Improving major amputation rates in the multicomplex diabetic foot patient: focus on the severity of peripheral arterial disease. TherAdvEndocrinolMetab. 2013; 4(3):83-94.

CARNEIRO JA, RAMOS GCF, BARBOSA ATF, MENDONÇA JMG, COSTA FM, CALDEIRA AP. Prevalência e fatores associados à fragilidade em idosos não institucionalizados. RevBrasEnferm [online]. 2016; 69(3): 435-442.

CARVALHO FILHA FFS, NOGUEIRA LT, MEDINA MG. Avaliação do controle de hipertensão e diabetes na Atenção Básica: perspectivas de profissionais e usuários. Saúde Debate. 2014; 38: 265-278.

OLIVEIRA JC, TAQUARY SAS, BARBOSA AM, VERONEZI RJB. Pé diabético e amputações em pessoas internadas em um hospital público: estudo transversal. ABCS Health Sci. 2016; 41(1): 34-39.

SANTOS ICRV, CARVALHO EF, SOUZA WV, ALBUQUERQUE EC. Fatores associados a amputações por pé diabético. J Vasc Bras. 2015; 14(1): 37-45.

SANTOS ICRV, SOBREIRA CMM, NUNES ENS, MORAIS MCA. Prevalência e fatores associados a amputações por pé diabético. Cienc Saúde Coletiva [online]. 2013; 18(10): 3007-3014.

SANTOS KPB, LUZ SCT, MOCHIZUKI L, D'ORSI E. Carga da doença para as amputações de membros inferiores atribuíveis ao diabetes mellitus no Estado de Santa Catarina, Brasil, 2008-2013. Cad Saúde Pública 2018; 34(1): 1-13.

SILVA JMTS, HADDAD MCFL, ROSSAINES MA, VANNUCHI MTO, MARCON SS. Fatores associados à ulceração nos pés de pessoas com diabetes mellitus residentes em área rural. Rev Gaúcha Enferm. 2017; 38(3): 1-9.

TAVARES DMS, DIAS FA, ARAÚJO RA, GILBERTO AP. Perfil de clientes submetidos a amputações relacionadas ao diabetes mellitus. RevBrasEnferm [online]. 2009; 62(9): 825-830.

TAVARES RE, JESUS MCP, CORDEIRO SM, MACHADO DR, BRAGA VA, MERIGHI MAB. Knowledge produced on the health of low-income older women: an integrative review. Rev Bras Enferm [online]. 2017; 70(4):875-84.

WORLD HEALTH ORGANIZATION 1999 [online]. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: diagnosis and classification of diabetes mellitus. Geneva: World Health Organization.

YOSHIDA VC, ANDRADE MGG. O cuidado à saúde na perspectiva de trabalhadores homens portadores de doenças crônicas. Interface – Comunic, Saúde, Educ [online]. 2016; 20(58): 597-610.

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