PROFILE OF PATIENTS WITH DIABETIC FOOT AT A PUBLIC HEALTH CENTER

PROFILE DOS PACIENTES COM PÉ DIABÉTICO DE UM SERVIÇO PÚBLICO DE SAÚDE

ABSTRACT

Objective: to characterize the profile of diabetic patients cared for at an outpatient clinic for diabetic people with injuries in the lower limbs. Method: descriptive, cross-sectional study with 331 diabetic patients with injuries in the lower limbs, who were referred to the evaluation of professional nurses. For data collection, we used a form and the patients’ records, submitted to double typing by independent people. We applied the software Statistical Package for the Social Science (SPSS) to analyze the frequency of categorical variables and averages of other types of variables. The research project was approved by the Ethics Committee, under Protocol No. 68/08. Results: Among the patients, 51.0% were women, most of them older adults, married or living with a partner in a stable relationship, and with low level of education. Most of them walked and had history of previous ulcer, 17.5% claudicated, 4.8% reported pain at rest, and 26.9% had amputated part of a lower limb. Conclusion: the physical examination of diabetic patients should include thorough evaluation of the feet and nurses play key a role in this process. Descriptors: Diabetic Foot; Nursing; Complications of Diabetes.

RESUMO

Objetivo: caracterizar o perfil dos pacientes diabéticos atendidos em um ambulatório de referência para pessoas diabéticas, com lesões em membros inferiores. Método: estudo transversal descritivo, com 331 pacientes diabéticos com lesões nos membros inferiores, que foram submetidos à avaliação do profissional enfermeiro. Para coleta de dados utilizaram-se formulário e o prontuário do paciente, submetidos a dupla digitação por pessoas independentes. Foi empregado o Programa Statistical Package for the Social Science (SPSS) para gerar análises de frequências de variáveis categóricas e médias de outros tipos de variáveis. Este estudo teve o projeto de pesquisa aprovado pelo Comitê de Ética, sob o protocolo nº 68/08. Resultados: entre os pacientes, 51,0% eram mulheres, a maioria idosa, casadas ou em união estável e com baixa escolaridade. A maioria deambulava e apresentava história de úlcera prévia, 17,5% claudicavam, 4,8% referiam dor em repouso e 26,9% haviam amputado parte de um membro inferior. Conclusão: o exame físico do paciente diabético deve incluir avaliação minuciosa dos pés e o enfermeiro desempenha papel fundamental nesse processo. Descriptores: Pé Diabético; Enfermagem; Complicações do Diabetes.

RESUMEN

Objetivo: caracterizar el perfil de los pacientes diabéticos atendidos en un centro ambulatorio para personas diabéticas, con lesiones en las extremidades inferiores. Método: estudio descriptivo, transversal con 331 pacientes diabéticos con lesiones en las extremidades inferiores, sometidos a la evaluación del enfermero profesional. Para la recopilación de datos se utilizaron un formulario y los registros de los pacientes, sometidos a doble digitación por personas independientes. Se empleó el programa Statistical Package for the Social Science (SPSS) para analizar la frecuencia de variables categóricas y promedios de otros tipos de variables. Este proyecto de investigación fue aprobado por el Comité de Ética, bajo el Protocolo N° 68/08. Resultados: entre los pacientes, 51,0% eran mujeres y la mayoría tenía edad avanzada, casadas o en unión estable y con baja escolaridad. La mayoría deambulaba y poseía historia de úlcera anterior, 17,5% claudicaban, 4,8% afirmaba tener dolor en reposo y 26,9% había amputado parte de un miembro inferior. Conclusión: el examen físico del paciente diabético debe incluir una evaluación cuidadosa de los pies y los enfermeros juegan un papel clave en este proceso. Descriptores: Pie Diabético; Enfermería; Complicaciones del Diabetes.
INTRODUCTION

Foot disorders of diabetic patients arise from atherosclerosis and peripheral neuropathy. Atherosclerosis typically leads to ischemia and neuropathy causes motor, sensory and autonomic alterations. Motor changes are characterized by secondary atrophy of skeletal muscles in the legs and feet. Sensory changes cause a reduction in pain and proprioceptive sensitivity. In autonomic changes, sweating decreases and this fact leads to dryness and the appearance of fissures in the skin and blood flow change. The development of foot ulcers is related to factors that form a critical triad composed by neuropathy, deformity and light traumatisms.

In Belo Horizonte, State of Minas Gerais, Brazil, there are no studies on prevalence of diabetes mellitus and its complications in the population. However, there are data provided by the Adults Health Care Office of the Municipal Health Department of Belo Horizonte (SMSA-PBH), which show that in 2004, among the group of diabetic patients, there was a percentage almost equivalent of amputations at thigh level compared to amputations of toes, which were of 31 and 33%, respectively.

According to a classification of the Ministry of Health, the degree for developing foot ulcers is characterized as ‘zero risk’ for absent neuropathy, ‘risk I’ for present neuropathy without deformities, ‘risk II’ for present neuropathy, deformities and/or peripheral vascular disease, or ‘risk III’ characterized by the presence of ulcer/previous amputation.

Despite the existence of a flow determining that only diabetic patients presenting risk grade II or III should be referred to the center for diabetic foot treatment—scenery of this study—it has been observed during nursing consultation that a part of the patients referred from Basic Health Units (UBS) or hospitals does not fit those risk criteria. Many patients referred have calluses, skin and nails mycosis and zero risk (absent neuropathy) or risk I (present neuropathy without deformities), which characterizes the absence of risk or low risk.

At the same time, it is observed the referral of people with very serious injuries associated with critical ischemia or deep and extensive infections with hemodynamic repercussion, including patients in postoperative phase after amputations, revascularization surgery or debridement with signs of complications in surgical injury, infection, necrosis or bone exposure. The situation described raises doubts about the real profile of diabetic patients cared for at the center mentioned, whose service was restructured several years ago.

Thus, this study aims to characterize the profile of diabetic patients cared for at the outpatient clinic for diabetic people with injuries in the lower limbs. The results can provide discussions together with the Municipal Health Department of the city of Belo Horizonte for evaluation of care in vascular surgery, with an emphasis on care for diabetic patients with lower limb injuries.

METHOD

This is a descriptive, cross-sectional study conducted in an outpatient clinic for diabetic people with lower limb injuries. The population was composed by diabetic patients registered and cared for by nurses in a period of 12 months and the sample was constituted by the medical records of these patients, totaling 331 records. In this study, the sample corresponded to the population.

For the characterization of patients, we used the following variables: sex; age; race/color; marital status; family status; education; occupation; and origin. For the evaluation of patients’ lower limbs, we analyzed the following variables: mobility; intermittent claudication; pain at rest; prior ulcer; prior amputation and its level; presence of calluses, fissures, deformities and their types; protective sensitivity on the sole of the foot; foot mycosis (interdigital or onychomycosis); and signs of venous and arterial insufficiency. In order to characterize the active injury, we assessed the following variables: number of injuries; age; injured area; triggering factor; location; etiology; tissue loss; and presence of clinical signs of infection.

For data collection, we used forms containing items related to the socio-demographic profile of patients, their health conditions and characteristics of lower limbs and injuries. The data were extracted from patients’ records and submitted to double typing by independent people, checking out possible errors in this process. We used the Statistical Package for the Social Science (SPSS) to analyze the frequencies of categorical variables and other types of variables.

The research project was approved by the Ethics and Research Committee of the Federal University of Minas Gerais (UFMG), Opinion No. 68/08 and the Municipal Health ...
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Department of Belo Horizonte, Opinion No. 023/2008, in conformity with the principles that guide the conduct of research involving humans, in accordance with the resolution 196/96 of the National Health Council.

RESULTS

Of 331 patients, 162 (48.9%) were male and 168 (50.8%) female. As for the age group, 217 (65.6%) patients were over 60 years old, and the largest concentration was in the range between 60 and 69 years old (30.8%). The age ranged between 27 and 94 years, with an average of 64 years (± 11.8%). Most of the patients had white skin (42.9%), followed by brown (35.3%) and black (20%).

Regarding marital status, 131 (39.6%) patients were married or lived with a partner in a stable relationship. These data were not recorded in the medical records of 120 (36.3%) patients. Most of them (87.6%) lived with relatives, but 35 (10.6%) lived alone. Only three (0.9%) patients had complete higher education, 132 (39.9%) had incomplete elementary school, and 126 (38.1%) were illiterate, representing a population with low level of education. A significant part of the sample was composed of retirees or pensioners (48.6%), followed by formally active patients (29.3%). Four patients (1.2%) were on sick leave and 56 (16.9%) were unemployed. The vast majority (86.1%) was from the city of Belo Horizonte, 38 (11.5%) had been referred by the municipalities of the metropolitan region of Belo Horizonte and seven (2.1%) from the countryside of Minas Gerais.

Most patients (94.0%) walked; although 23.9% needed some kind of support to do so, and 18 patients (5.4%) did not walk. However, complaints about the intermittent claudication were reported by 58 patients (17.5%), while 16 (4.8%) reported pain at rest.

Records of previous ulcer and amputation of part of a lower limb were positive for 206 (62.2%) and 89 (26.9%) patients, respectively. It is worth noting that when there is a prior amputation, the level of that intervention is ranked higher when it occurred in the transmetatarsian region or above, and smaller when it occurred under the metatarsian joint. The amputations were lower level in 59 patients (65.6%) and higher level in 25 (27.8%).

As regards the conditions of the feet, 157 patients (47.4%) had calluses or fissures and 117 (35.4%) had deformities, of which the most frequent were clawing of the toes (56.4%), hallux valgus (14.5%) and hammer toes (10.3%). Protective feet sensitivity was absent in 104 patients (31.4%) and most of them (74.9%) had mycosis of the feet. Signs of arterial and venous insufficiency were present in 143 (43.2%) and 172 (52.0%) patients, respectively.

At the time of the first evaluation, 280 patients (84.6%) had active injure, ranging from one to six injuries. Of patients with injury, 230 (72.5%) had one injury and 62 (22.1%) two injuries. The others had three (2.9%), four (2.1%), or six (4.0%) injuries. Regarding the period of existence of the injuries, they had been present for less than one month (35.0%) and from one to four months (38.9%), including up to three patients (1.1%) that have had injuries for more than 120 months. The area of the injuries ranged from less than 50 cm² to more than 250 cm². The area of 244 patients' injuries (87.1%) was smaller than 50 cm² and 25 (8.9%) had injuries with an area ranging from 50 to 150 cm². Few patients had large injuries with area between 15 and 250 cm² (1.4%). This data was absent in one medical record.

The location of the injuries was diverse and they were found in the region of the leg (28.2%), toes (25.4%), sole of the foot (15.7%), sides (14.3%), and the back of the foot (13.6%). Most of these patients (61.8%) presented injuries classified as deep partial (61.8%), deep total (15.3%), or superficial (22.1%). This data was not registered in two records. Clinical signs of infection sites were presented by 71 patients (25.4%).

Regarding the etiology of the injuries, most patients (71.8%) did not have this data in the medical records. Of those presenting a defined etiology of the injury (24.3%), 20.0% were surgical, 2.1% neuropathic, 0.4% microangiopathic, and 1.4% corresponded to venous injuries. The risk of the foot presenting injury was not recorded in the medical records of 322 patients (97.3%). In patients' records with registration, we observed risk zero, I and III in five (1.5%), three (0.9) and one patient (0.3%), respectively.

DISCUSSION

The socio-demographic variables—together with the clinical history and the evaluation of risk for complications in the feet—are elements that contribute to identify triggering factors for the occurrence of diabetic foot.4 In this study, we did not observe significant variation between the sexes. However, other studies point to the predominance of this issue in males.5,6 The average age of patients
in this study was 64 years. The age next to 60 years reiterates the insidious development of diabetes mellitus and its complications. Considering that most of the patients were in the age group over 60 years, many of them were already retired, a condition that has already been identified in the literature.7

With regard to the skin color of the patients, 42% were white, which is a much lower result compared to those of the 88 patients assessed in research about people with diabetic foot.8 Most patients (84.6%) featured active injury of the lower limbs and probably would need rest to accelerate recovery. However, 29.3% were employees and only 1.2% were on sick leave. Such data lead to assume that the low percentage of employed patients on sick leave is due to the lack of social security and/or possible wage reduction as a result of sick leave.

Family support is crucial in the care for the diabetic patients, because it is an ally to the acquisition of appropriate health guidelines and the process of dealing with the disease.9 However, the fact that the patients lived in the company of family members (88.8%)—partners, children or others—did not decrease the occurrence of complications, since 87.6% of patients developed diverse complications.

We found a percentage around 47% of illiteracy or low level of education, constituting an aggravating factor for the development of chronic complications of diabetes, by limiting access to information. However, these results do not correspond to the situation in the southeastern region of the country when compared to data of the Brazilian Institute of Geography and Statistics (IBGE), which in 2008 identified that 15.8% of the population were illiterate.10

The likely absence of secondary care services provided to patients with diabetic foot in several municipalities or main cities of the State of Minas Gerais can justify the referral of 13.6% of patients to Belo Horizonte, where specialized services in the care for patients with this issue are available. The ability to walk, observed in 70% of the patients, is an important aspect for self-sufficiency. The impaired mobility of the person with diabetes can trigger or aggravate injuries in the feet.11

Intermittent claudication is one of the clinical manifestations of peripheral arterial insufficiency, which, in the vast majority of cases, tends to be located in the calf when there is stenosis or arterial obstruction.12 This manifestation was reported by 17.5% of patients in this study. Pain at rest is a critical circulatory condition in arterial terms and it corresponds to stage 3 in Fontaine’s classification. This stage precedes ulceration or gangrene, or corresponds to the ankle/arm blood pressure index (AAI) from 0.13 to 0.39.13 Among the patients studied, 44.8% presented pain at rest.

The high percentage of patients with previous ulcer (62.2%) can be attributed to the lack of specific data in the nursing consultation, which possibly includes all and any ulcer, regardless of its etiology and localization.

In our study, lower limb amputations took place in almost 27% of the patients. Amputation of a limb is the most feared and costly complication of a foot injury.14 Loss of sensitivity, foot deformities and limited joint mobility may result in abnormal foot biomechanics. As a normal response, a callus is formed due to excessive mechanical stress. The autonomic impairment interferes with the sweating of the feet, which dry and are thus predisposed to fissures.15 The occurrence of calluses and fissures was significant in this study (47.4%).

Among the deformities found in the patients studied, the most relevant were clawing toes in 56.4% of the patients. Neuropathy leads to insensitivity and subsequently to the deformity of the foot, with the possibility of developing an abnormal gait.15 The loss of sensitivity is an important predictive factor for the development of foot ulcers,16 since, due to the lack of painful response, peripheral neuropathy favors the repetition of tissue trauma, contributing to the development of injuries. This alteration was confirmed in almost 65% of the sample. Mycosis was in nearly 75% of the patients of this study. Fungal infections in diabetic patients often develop into complications and its treatment is indispensable.17

More than 43% of the patients had signs of arterial insufficiency. When the peripheral occlusive arterial disease is detected in diabetic patients, two issues should be carefully observed: whether the patient has a stable framework of intermittent claudication; and whether there is presence of severe ischemia associated with injury and infection.14

The assessment of lower limbs also involved the identification of signs of venous insufficiency, since some patients cared for by the team of the health center presented clinical signs of this disorder. The referral of patients with venous insufficiency to this
center is probably due to the fact that the risk of ulcer classification used by the service defines as risk II the patients with signs of peripheral vascular disease, which may include venous insufficiency. This classification was revised in 2006 by the Ministry of Health, which established that for risk II the signs must refer to peripheral artery disease. However, this change had not yet been adopted by the service mentioned.

As for the area of ulcers, most had an area with less than 50 cm² and this small area was compatible with neurotrophic ulcers, as confirmed in similar research. Trauma was the main cause of injury triggering in this study. Other relevant data refers to the fact that almost 16% of the patients were admitted to the service after hospital discharge, with open surgical lesions due to amputation, debridement, or both. The foot insensitive by neuropathy does not ulcer spontaneously, i.e., traumatic causes are associated, as for example, use of inappropriate shoes and thermal or mechanical aggressions.

In this study, the most affected foot region was that of toes (25.4%). Bone deformities in the forefoot metatarsal heads represent areas of excessive pressure on the sole of the foot surface while walking. The presence of leg injury was identified in 28.2% of the patients. The percentage obtained was due to the presence of ulcers of venous etiology and injuries from amputations and/or debridement, present in various regions of the leg.

Approximately 25% of the patients had injuries with signs of infection. Changes in circulation and peripheral neuropathy cause the occurrence of infection, which is more common in diabetic patients and its control becomes more difficult. Regarding the depth, the injuries classified as partial loss were prevalent (61.8%).

Risk factors that the patients have for the development of ulcers are detected by the socio-economic and clinical history of patients, associated with general, neurological and specific vascular tests of the feet. Degrees of risks can be used to classify diabetic patients, and this degree is associated with the risk of ulceration, need for hospitalization and amputation.

Despite the importance of qualifying the risk of ulcer occurrence, only 2.7% of patients had risk classification written down in the medical records. The classification allows identifying which and how many patients have from absence of additional risk to high risk of ulcers. From these data, it is possible to structure a gradual system of assistance that can serve and monitor patients in an ongoing and preventive basis, rather than in a purely emergency service, prioritizing those with high risk. It is worth noticing that nursing care configures the essence of this profession.

**FINAL CONSIDERATIONS**

The occurrence of diabetic foot is linked to socio-economic issues, in addition to the predisposing factors associated with the underlying disease. The likely absence of secondary care services provided to patients with diabetic foot in several municipalities favors complications and more invasive interventions, such as amputation.

Signs and symptoms of the patient with diabetic foot, such as pain at rest, claudication and presence of ulcers, should be valued and investigated for possible intervention. Diabetic neuropathy leads to the insensitivity of the limbs and subsequently to the various intercurrences that often culminate with the amputation of the foot. The physical examination of the diabetic patient should include thorough evaluation of the feet—which is not always the case—and the nurse, as caregiver, plays a fundamental role in this process. The interdisciplinary team should work in harmony, providing care for patients with diabetic foot cautiously and intervening in order to prevent this pathology.

**REFERENCES**


