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Socio-Demographic, Clinical and Diabetes Status of Foot Ulcer Patients

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Abstract

Background: Foot ulcers are considered as a serious complication, especially for patients with diabetes. People with diabetes and people with peripheral vascular disease are more likely to develop foot ulcers. If an infection occurs in an ulcer and is not treated in the proper way, it can develop into cellulitis, osteomyelitis, or gangrene that may require some part of the toe, foot, or lower leg to be amputated. The aim of this study was to find the socio-demographic, clinical, and diabetes status of foot ulcer patients. **Material & Methods:** This prospective observational study was conducted in the Department of Surgery, Rajshahi Medical College Hospital, Rajshahi, Bangladesh, during the period from March 2012 to August 2012. In total 100 patients with foot ulcers in the different surgical units of the mentioned hospital were enrolled in this study as study subjects. Data from the study regarding age, sex, occupation, smoking habit, and socio-demographic condition were recorded in the prescribed questionnaire. The purposive sampling technique was used for this study. All data were processed, analyzed, and disseminated using MS Excel and SPSS version 23 programs as necessary. **Results:** In this study, the male-female ratio of the participants was 2:1. The maximum number of patients (42%) were from the age of 51-60 years and the highest number of patients were housewives (28%), followed by farmers (22%). Among the total male patients, 87.88% were smokers. Low HDL was found in 51% of patients and 68% of patients had been suffering from diabetes mellitus,18% from Buerger's disease and 6% from atherosclerosis, and 8% from malignant foot ulcer. Most of the diabetic patients (95.59%) were hyperglycemic on admission and 55.88% had diabetes for 6-10 years. On admission, 3 patients (4.41%) had controlled blood sugar and 65 patients (95.59%) had uncontrolled blood sugar. **Conclusion:** The frequency of foot ulcers among the male population was higher than that in females. Concerning occupation of the patients, housewives and farmers were the most prevalent. Smokers were most affected groups among the study population. Pre-diagnosed diabetes mellitus for a long period was one of the major clinical issues in most of the patients. Uncontrolled blood sugar was also seen in majority of the patients regarding clinical background.

Keywords:- Socio-demographic, Clinical status, Diabetes, Foot ulcer, Blood sugar.

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INTRODUCTION

A foot ulcer is considered a serious complication of diabetes mellitus. Twenty-four million Americans had diabetes and 3.6 million or 15% will develop a foot ulcer at the same time.[1,2] The most common contributing factors in creating DFU are neuropathy, peripheral artery disease (PAD), deformity and minor trauma.[3] However, when the ulcer appears, other factors usually influence the outcome of the disease. The additional contributing factors are necrosis, gangrene, infection, PAD, advanced age of the patient and other co morbidities such as end stage renal disease (ESRD), and heart failure.[4] The DFU patients are usually older males with a history of prolonged DM combined with poor health condition. They usually depend on assistance of others to perform their daily activities. The average age of these patients is 65 years and they are usually presented with the disease for at least 10 years. The majority of them have a history of uncontrolled diabetes in addition to increased level of HbA1c, and in one-third of the cases other co-morbidities are present.[5] The annual incidence of ulcers among people with diabetes is 2.5 (0.7%) and the annual incidence of amputation is 0.251 (8%).[6] In 2007, the treatment of diabetes and its complications in the United States generated at least $116 billion in direct costs and at least 3.3% of this cost was linked to the development of foot ulcers.[7] In a study in Bangladesh, the rate of active foot ulcers among diabetic patients is 2.9%. The intervention aimed at preventing foot ulcers in patients such as the comprehensive control and education of people with DM and PVD and their families as well as health professionals had been shown to reduce lower extremity amputation by 50% and 85%.[8] A diabetic foot ulcer is a major problem that significantly impairs the quality of life of the patients, leads to prolonged hospitalization, and may result in a major amputation. In developed countries, almost all peripheral arterial disease (PAD) is due to atherosclerosis. Approximately 20% of middle-aged (55-75) people in the UK have PAD but only one-quarter of them will have symptoms. Plaque must reduce arterial diameter by 70% (critical stenosis) to reduce flow and pressure at rest, on exertion (e.g. walking), a much lesser stenosis may become critical. Buerger's disease is a progressive, non-atherosclerotic, segmental inflammatory occlusive disease, primarily involving the small and medium-sized arteries of the upper and lower extremities with the involvement of the neighboring veins. It characteristically affects distal arteries. Buerger'sdisease is unique and contrasts with atherosclerosis in that the disease commences peripherally and progresses cephalad, reaching the intrahospital arteries within a short time after the onset of symptoms.

MATERIAL AND METHODS

This prospective observational study was conducted in the Department of Surgery, Rajshahi Medical College Hospital, Rajshahi, Bangladesh, during the period from March 2012 to August 2012. In total 100 patients with foot ulcers attended the different surgical units of the mentioned hospital and were enrolled in this study as study subjects. The purposive sampling technique was used for this study. The study was approved by the ethical committee of the mentioned hospital. Properly written consent was taken from all the respondents before data collection. Data regarding age, sex, occupation, smoking habit,

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and socio-demographic condition were recorded in the prescribed questionnaire. As per the inclusion criteria of this study, patients admitted to the surgery ward with foot ulcers, age 18 years or above were included. On the other hand, according to the exclusion criteria of this study, patients with acute foot ulcers following trauma, aged below 18 years were excluded. All the demographic and clinical data of the participants were recorded. All data were processed, analyzed, and disseminated by using MS Excel and SPSS version 23 program as per necessity.

RESULTS

In this study, among the total of 100 participants, 66% were male whereas the rest 34% were female. So, male participants were dominating in number and the male-female ratio was 2:1 The maximum number of patients (42%) were from the age of 51-60 years. As per the occupational status, the highest number of patients were housewives (28%), followed by farmers (22%). [Table 1] Among total male patients, 87.88% were a smoker and 8 patients (12.12%) were nonsmokers. [Figure 1] Among the highest number of participants (72%), the presence of arterial pulsation was observed. [Table 2] Abnormal lipid profiles like elevated cholesterol and low HDL were found in 51% of patients. [Table 3] Out of 100 patients, it was found that 68 patients (68%) had been suffering from diabetes mellitus,18 patients (18%) from Buerger's disease, and 06 patients (6%) from atherosclerosis (non-diabetes) and 08 patients (8%) from malignant foot ulcer. [Figure 3] Most of the diabetic patients (95.59%) were hyperglycemic on admission and 55.88% had diabetes for 6-10 years. [Table 4] On admission, 3 patients (4.41%) had controlled blood sugar and 65 patients (95.59%) had uncontrolled blood sugar. [Figure 4]

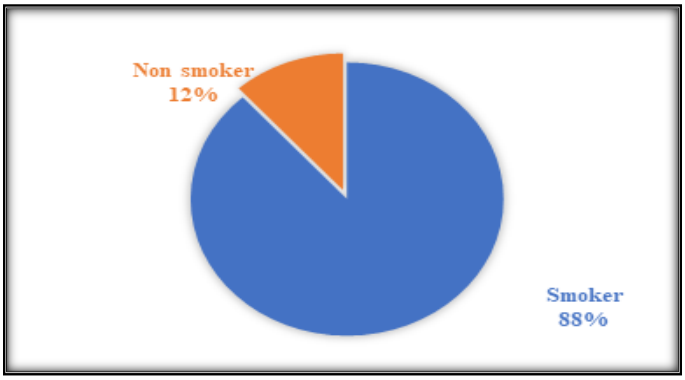

Figure 1: Smoking habits among male patients (n=86).

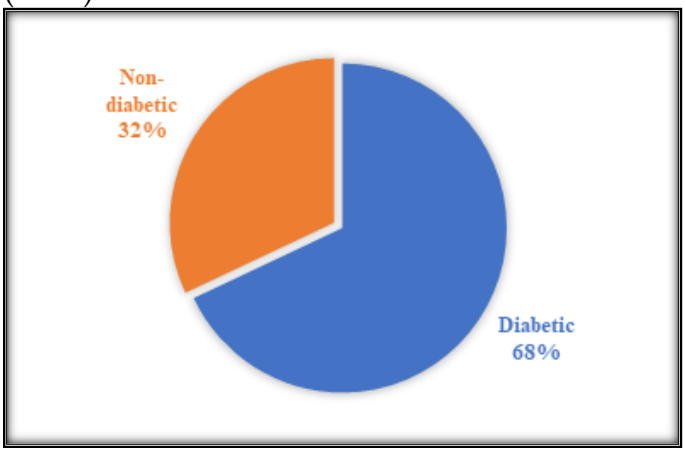

Figure 2: Diabetes status of participants(N=100)

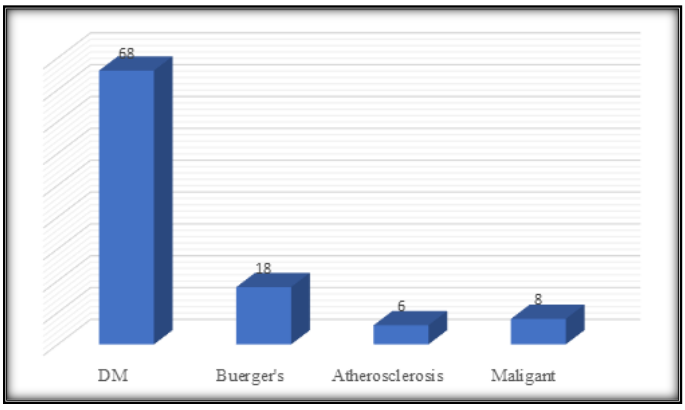

Figure 3: Aetiology of foot ulcer among participants(N=100)

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Table 1: Age, sex and occupation status of patients (N=100)

Characteristic	n	%
Age distribution		
20-30	6	6%
31-40	14	14%
41-50	20	20%
51-60	42	42%
61-70	18	18%
Sex incidence		
Male	66	66%
Female	34	34%
Occupation incidence		
Farmer	22	22%
Day laborer	13	13%
Businessman	21	21%
Service holder	16	16%
Housewife	28	28%

Table 2: Distribution of the patients by arterial pulsation(N=100).

Arterial pulsation	n	%
Presence of arterial pulsation	72	72%
Absent plantar arteries pulsation	16	16%
Absent popliteal arteries pulsation	10	10%
Absent femoral arteries pulsation	2	2%

Table 3: Distribution of the patients by lipid profile (N=100)

Lipid profile	n	%
High total cholesterol	16	16%
High triglyceride	21	21%
High LDL	32	32%
Low HDL	42	42%
Normal	49	49%

Table 4: Duration of DM before the onset of foot ulcer (n=68)

Duration of DM	n	%
<5 years	4	5.88
6-10 years	38	55.88
11-15 years	18	26.47
Newly diagnosed	8	11.76

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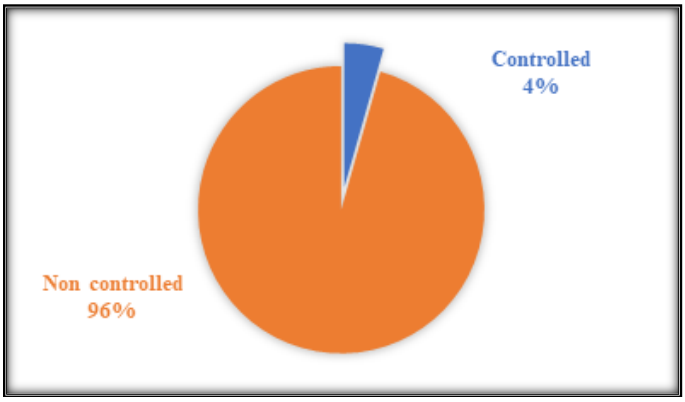

Figure 4: Situation of blood sugar level on admission (n=68)

DISCUSSION

In this study, among the total of 100 participants, 66% were male whereas the rest 34% were female. The maximum number of patients (42%) were from the age of 51-60 years. The youngest patient was a female aged about 28 years and the oldest one was a male aged about 83 years. Gershater et al,[9] also found a higher prevalence in men than women progressing foot ulcers. Doupis et al,[10] described that men may have more risk factors and risk for trauma and infection. In disparity, Edmonds and Foster,[11] found no difference between sexes in the prevalence of ulcers. In this study, as per the occupation distribution, the highest number of patients were housewives (28%), followed by farmers (22%). A study from north India also showed a greater prevalence of diabetic foot ulcers in farmers.[12] Among total male patients, 87.88% were a smoker and 8 patients (12.12%) were nonsmokers in this study. In a study by Syauta D, Hendarto J et al it was observed that, smoking had significant correlation with foot ulcer which isquite similar to this present study.[13] Abnormal lipid profiles like elevated cholesterol and low HDL were found in 51% of patients in this study. Parial CH, Islam M et al found in their study a similar result showing decreased HDL and increased LDL & TG in lipid profile in patients with diabetic foot ulcer.[14] Among all the study subjects, 68% were diabetic and almost 96% of the patients had uncontrolled blood glucose level in the present study. According to a study of Kateel R, Augustine AJ et al diabetic foot ulcer patient had poor blood glucose control with elevated HbA1C and fasting blood glucose level.[15] The mean duration of DM was 80.4 months in a study by Anumah FO, Mshelia-Reng R. et al.[16] The number and severity of foot ulcers in our country not to be negligible. People are poor and they have lack of education. They are unaware of foot care. They walk barefoot or use improper footwear. Foot ulcers had been neglected in healthcare research and planning. Clinical practice was based more on opinion than scientific fact. Despite treatment, readily become a chronic wound. Healed ulcers often recur. Early identification of major risk factors could permit the prevention of their severe complication. The intervention aimed at preventing foot ulcers in patients such as the comprehensive control and education of people with DM and PVD and their families as well as health professionals had been shown to reduce lower extremity amputation by 50% and 85%.[8] A low level of education has been reported as the cause of the increasing prevalence of DM in the rural sector of Sri Lanka and DPN in UAE, both contributing to foot ulceration.[17] Delbridge et al,[18] noted a significant relationship between the level of patient understanding of diabetes mellitus and diabetic foot problems and the development of foot lesions in a cohort of 80 diabetic patients. Bachmann et al,[19] measured education in terms of schooling received and reported more severe

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complications among patients who had received less education. The less educated were also more likely to be seen as non-compliant by health professionals and used less hospital care. Indeed, education is usually seen as the key to better health as it facilitates an individual to better utilize health information and treatment.[20,21]

Limitations of The Study

This was a single-centered study with small-sized samples. Moreover, the study was conducted in a tertiary care hospital or referral center. Although they came from different tiers of society and districts of Bangladesh, they were not representative of all children with CP in this country.

CONCLUSIONS

The frequency of foot ulcers among the male population was higher than that in females. Concerning occupation of the patients, housewives and farmers were the most prevalent. Smokers were most affected groups among the study population. Pre-diagnosed diabetes mellitus for a long period was one of the major clinical issues in most of the patients. Uncontrolled blood sugar was also seen in majority of the patients regarding clinical background.

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