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ORIGINAL ARTICLE

Foot care practices of diabetic patients in Saudi Arabia



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KEYWORDS

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Abstract Diabetic foot is a serious complication that causes lower extremity amputations. The aim of this study was to identify the patient's awareness about risk factors for diabetic foot disease and to explore the knowledge and foot care practices among diabetic patients in a Saudi population. This cross-sectional study was conducted in King Khalid University Hospital (KKUH), King Abdulaziz University Hospital (KAUH), King Fahad Medical City, National Guard Hospital, Military Hospital, and Prince Salman Hospital capital city of Saudi Arabia. Patients were eligible if they had diabetes foot disease, signed the consent form, and completed the questionnaire. We selected 350 patients from different hospitals between November-2011 and April-2012. The majority of patients (68%) were selected from King Saud University hospitals. The mean age of patients was 50.87 ± 15.9 years with a range of 20–90 years. The majority of patients were male (64.3%) and had a family history of hypertension (55.4%), high total cholesterol (58.6%), and other diabetes (58.9%). A family history of smoking, a major risk factor for diabetic foot, was found in 20.3% of cases. Sixty percent of the patients were using oral medications, 27.1% were using insulin therapy, 10% were using both oral and insulin therapies, and 10% were on diet. In our study, 19.4% of participants were illiterate while 80.6% had a high school or university level education. Our findings also revealed that some patients had a lack of knowledge concerning diabetic foot disease and future complications. Patients are unaware of the risk factors for diabetes foot and practice poor foot care. Awareness programs should be mandatory in all hospitals and diabetes clinics to help compensate for the lack of awareness and lack of podiatric educational services. Such programs may decrease the risk of diabetes foot disease.

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1. Introduction

Diabetes mellitus is a chronic metabolic multifactorial disorder associated with altered glucose homeostasis as well as macro and microvascular complications including preventable foot problems that are common occurrences in these patients (Khan et al., 2015; Bowling et al., 2015). Diabetic foot problems are a major cause of morbidity and premature mortality

and contribute substantially to health care costs (Guell and Unwin, 2015). Foot ulcerations are also a major complication in diabetes patients (~25%) and infected diabetic foot ulcers are responsible for 60% of nontraumatic lower limb amputations (Mottola et al., 2015). Previous studies have reported that early identification of people at high risk for foot problems and management of the risk factors could prevent lower extremity amputations and foot ulcerations (Ogrin and Sands, 2006; Schwegler et al., 2002; Wu et al., 2005; Elsharawy et al., 2012). Identifying the role of risk factors for foot ulceration will enable health providers to implement better prevention programs that could result in improved patient quality of life and, thus, reduce the economic burden for both the patient and the health care system (Al-Rubeaan et al., 2015). Many studies have been conducted in Saudi populations with risk factors for complications from diabetic foot (Schwegler et al., 2002; Wu et al., 2005; Hu et al., 2014; Al-Zahrani et al., 2014; Al-Wakeel et al., 2009; Al-Mahroos and Al-Roomi, 2007; Akbar et al., 2000); however, only one diabetic foot awareness program has been implemented in this population (Al-Wahbi, 2010). Based on the identified risk factors of diabetic foot disease, implementing an education and awareness program as well as providing prophylactic treatment will help prevent devastating complications in the diabetic population. Based on the earlier awareness programs implemented in Riyadh, Saudi Arabia, we designed and conducted a hospital-based study for Saudi Arabian patients with diabetic foot disease to explore the knowledge and foot care practice among diabetic patients.

2. Materials and methods

2.1. Patient enrollment

This study was a cross-sectional hospital-based study conducted between November 2011 and April 2012 in hospitals throughout Riyadh, Saudi Arabia. Hospitals such as King Khalid University Hospital (KKUH), King Abdulaziz University Hospital (KAUH), King Fahad Medical City, National Guard Hospital, Military Hospital, and Prince Salman Hospital participated in this study. We recruited participants from outpatient clinics in endocrine departments in participating hospitals. After signing the consent form, patients affected with diabetes foot responded to the study questionnaire. Patients who were not diabetic, were less than 18 years old, did not sign the consent form, or had an incomplete questionnaire were excluded from participation. Ethical approval was obtained from King Saud University, Riyadh and Saudi Arabia. Peripheral blood (2 mL) was obtained from each participant using ethylenediaminetetraacetic acid vacutainers, and glycated hemoglobin (HbA1c) tests were performed to confirm the presence of diabetes (Khan et al., 2014).

2.2. Statistical analysis

The statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) software (version 18.0, SPSS IBM Inc., Chicago, IL, USA). Data were analyzed using means, standard deviations, and cumulative frequency percentages.

3. Results

3.1. Patient selection

This hospital-based study was conducted with 350 subjects (225 males and 125 females) recruited from different hospitals in the capital city of Saudi Arabia. The selection process is described in Table 1. The majority of participants (68%) were recruited from King Saud University hospitals (40% from KKUH and 28% from KAUH).

3.2. Baseline characteristics

The mean age of participants was 50.87 ± 15.9 years with a range of 20–90 years. The clinical and biochemical characteristics of each patient along with their family history are shown in Table 2. Almost two-thirds of patients were male (64.3% versus 35.7% female) and almost half of the patients (46.6%) smoked. The majority of participants (98%) were Saudi Arabians. Among the total sample, 50.6% had abnormal HbA1c values, 62.6% had hypertension, and 65.1% had a high total cholesterol (TC) level. Sixty percent of patients were taking oral medication, 27.1% were using insulin therapy, 10% of them were using both oral and insulin therapies, and 10% of the total sample was on a diet.

3.3. Risk factors associated with family history

More than half of the participants (58.9%) had a family history of diabetes and 20.3% had a family history of smoking. A family history of high TC (56.6%), hypertension (55.4%), and muscle cramps (49.7%) was also identified in this population. We also found a family history of sores/cuts (21.1%), foot ulcers (32%), amputation (7.7%), and joint identity (7.4%). Details regarding family history are shown in Table 3. In addition, diabetes foot risk factors were correlated with the family history and patients who had a family history of multiple risk factors were more prone to develop diabetes.

3.4. Level of risk

Fig. 1 shows the risk of diabetes in our patients. Sixty-four percent of patients had a high risk based on previous ulceration, amputation, or the presence of more than one risk factor (such as the loss of sensation or signs of peripheral vascular disease with callus or deformity). A moderate risk, indicated by a loss

Table 1 Patient selection process.

S.no	Hospital names	Total numbers (%)
1	King Khalid University Hospitals	140 (40)
2	King Abdulaziz University Hospitals	98 (28)
3	King Fahad Medical city	19 (5.4)
4	National Guard Hospitals	28 (8)
5	Military Hospitals	31 (8.9)
6	Prince Salman Hospitals	34 (9.7)

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