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A clinical study of 50 cases of diabetic foot in upper hills of Himachal Pradesh

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Abstract

Background: Among persons diagnosed as having diabetes mellitus, the lifetime risk of developing a foot ulcer is high. Diabetic foot problems are a major cause of hospitalization and prolonged hospital stays. Diabetic foot problems, such as ulcerations, infections, and gangrene, are common cause of hospitalization among diabetic patients. Routine ulcer care, treatment of infections, amputations if required, and hospitalization pose a major financial problem and place a tremendous burden on the health care system. This clinical observation of patients with diabetic foot describes epidemiology, risk factors, clinical symptoms and extent of lesions in patients admitted at a tertiary center in upper hills of Himachal Pradesh.

Methods: Clinical profile of 50 patients of diabetic foot ulcers was studied. All the patients were subjected to complete hemogram, fasting and PP blood sugar, HbA1c, LFT, KFT, urine R/E, pus c/s, color Doppler of lower limb and x-ray foot.

Results: Majority of patients with diabetic foot lesions were young males with a single ulcer having diabetes for more than 2 years.

Conclusions: Diabetic foot is a major health problem in diabetic patients. In upper hills of Himachal majority of patients with diabetic foot belong to rural areas and of low socioeconomic class.

Keywords: A clinical study of 50 cases, diabetic foot, upper hills

Introduction

Diabetes has become one of the most common metabolic disorder. India currently leads the world with an estimated 40.9 million people with diabetes; this figure is predicted to increase to 69.9 million by 2025. The diabetes epidemic is more pronounced in urban areas in India, where prevalence rates of diabetes are roughly double than those in rural areas [1]. Diabetes by virtues of its other complications like neuropathy and vasculopathy and other factors alter the musculoskeletal and soft tissue mechanics in a manner that elevates planter pressure and makes tissue damage more likely, causing non-resolving neuro-ischemic ulcers at the weight bearing sites. This is why most of the skin injuries in diabetics are seen on the planter surface, frequently at the site of highest pressure under the foot [2]. In general, hospital stays too are approximately 60 percent longer among patients with foot ulcers compared with those without ulcers [3]. Diabetes-related amputations are at high risk of non-healing or super infection, thus requiring a second-step surgical revision treatment more frequently than in non-diabetic patients [4]. Early detection of potential risk factors for ulceration can decrease the frequency of wound development. It is recommended that all patients with diabetes undergo foot examinations at least annually to determine predisposing conditions to ulceration [5]. Patients should be educated regarding the importance of maintaining good glycemic control, wearing appropriate footwear, avoiding trauma, and performing frequent self-examinations [6]. The development of a diabetic foot ulcer is a multi-factorial process; however, the presences of obvious and/or subtle foot deformities are being recognized as a significant contributing factor. The diabetic foot is especially vulnerable to amputation because of the frequent complications of peripheral neuropathy (PN), infection and peripheral arterial disease (PAD). A combination of this triad leads to the final catastrophic events, gangrene and amputation. In India about forty thousand legs are amputated every year because of diabetes related foot complications. The vast majority (75%) of these are probably preventable because the amputation often results from an infected neuropathic foot [7]. At the Indian Institute of Diabetes in Bombay, India, more than 10% of all admissions for diabetes are primarily for foot management. More than 70% required surgical intervention and in more 40% of those interventions there was a toe or limb amputation [8].

Methods

The present study was conducted at Department of General Surgery, Dr. Yashwant Singh Parmar Government Medical College & Hospital, Nahan, Himachal Pradesh from November 2019 to October 2020 for one year amongst 50 patients of diabetic foot with various clinical presentations. Patients with a known history of diabetes and diagnosed diabetic on admission with a foot lesion i.e. ulcer, blister, abscess, cellulitis, gangrene were included in the study. Patients with chronic foot ulcers due to causes other than diabetes such as traumatic, arterial, venous, trophic, TB, syphilis and malignancy were excluded from study. All the patients of diabetic foot ulcer attending the surgery department and giving consent were included in the study. A detailed history of the patients was taken by the competent medical personnel and the patient was subjected to clinical examination. The statistical analysis was done

using SPSS (statistical package for social sciences) version 22.0 statistical analysis software. The values were represented in number, percentage (%) and means.

Results

Age of patients with diabetic foot ulcers ranged from 15 to 67 years with a mean age of 49.28±12.79 years. Overall 76% patients were above 40 years of age (Table 1).

Table 1: Age of study population.

Age group (years)	No. of patients	Percentage
Up to 20	1	2.00
21-30	4	8.00
31-40	7	14.00
41-50	16	32.00
51-60	15	30.00
>60	7	14.00

Table 2: Gender, habitat and occupational status of study population.

Variables	No. of patients	Percentage
Gender		
Female	20	40.00
Male	30	60.00
Habitat		
Rural	28	56.00
Urban	22	44.00
Occupation		
Housewife	19	38.00
Manual worker	19	38.00
Office worker	11	22.00
Student	1	2.00

Male predominance was observed in diabetic foot patients. Male: female ratio was 1:0.67. Majority of the patients of diabetic foot belonged to rural areas (56.00%) and rest to urban areas (44.00%). Most common occupations in the study population were housewife (38.00%) and manual workers (38.00%) followed by office workers (22.00%) (Table 2).

Pain (72.00%) was the most common presenting feature, followed by history of trauma (70.00%), ulcer (40.00%), claudication (24.00%) and recurrent infection (16.00%) (Table 3).

Hypertension was noticed as comorbidity in 14% patients whereas peripheral neuropathy was noticed in 30% patients (Table 4).

Table 3: Incidence of presenting symptoms in study population.

	No. of patients	Percentage
Pain	36	72.00
Ulcer	20	40.00
Recurrent infections	8	16.00
H/o trauma	35	70.00
Claudication pain	12	24.00

Table 4: Associated illness in study population.

	No. of patients	Percentage
Hypertension (CVS)	7	14.00
Peripheral neuropathy (nervous system)	15	30.00

Majority of the patients were vegetarian (72.00%) and rest were non-vegetarian (28.00%). 38.00% patients were smokers and 18.00% patients consumed alcohol. All patients who consumed alcohol were also smokers (Table 5). 48.00% of patients in study were found to be anemic, and 52% were non-anemic. BMI of 7 (14.00%) patients was found to be >30 kg/m^2 (Table 6).

Table 5: Dietary and personal habits in study population.

Variables	No. of patients	Percentage
Dietary habits		
Vegetarian	36	72.00
Non-vegetarian	14	28.00
Personal habits		
Smoking	19	38.00
Alcohol	9	18.00
Alcohol+smoking	9	18.00

Table 6: General condition of study population.

Variables	No. of patients	Percentage
Anemia		
Anemic	24	48.00
Non-anemic	26	52.00
Obesity (BMI)		
Normal/thin	43	86.00
Obese	7	14.00

Table 7: Diabetic treatment and duration of treatment in study population.

Treatment type	No. of patients	Percentage
Diet control	14	28.00
Oral hypoglycemic agents	30	60.00
Insulin	4	8.00
Oral hypoglycemic agent + Insulin	2	4.00
Duration of treatment		
Upto 1 year	21	42.00
2-5 years	23	46.00
6-10 years	6	12.00

Min-Max: 0-10 years (Median: 2 years); Mean±SD: 2.73±2.63 years

Approximately one-half of the patients were suffering from 2-5 years (46.00%). Duration of treatment <1 year was noted in 21 (42.00%) patients and rest 6 (12.00%) patients had been suffering for 6-10 years.

Majority of the patients were on oral hypoglycemic agents (60.00%), followed by on diet control (28.00%), only 4 (8.00%) patients were on insulin and 2 (4.00%) patients were taking both insulin and OHA (Table 7).

Dorsum of foot was involved in 30.00% patients, followed by toe 22.00%, sole in 18.00%, web 14.00%, heel 6.00%, foot 2.00% and other sites in 8.00%. Nail and skin was affected in 11 (22.00%) patients.

Most common mode of presentation was ulcer (52.00%) followed by gangrene (22.00%), abscess (12.00%), cellulitis (10.00%) and blisters (4.00%) (Table 8).

Table 8: Characteristics of diabetic foot lesions.

Variables	No. of patients	Percentage
Area of foot		
Dorsum	15	30.00
Foot	1	2.00
Heel	3	6.00
Sole	9	18.00
Toe	11	22.00
Web	7	14.00
Other	4	8.00
Other changes		
Skin and nail involvement	11	22.00
Mode of presentation		
Abscess	6	12.00
Blister	2	4.00
Cellulitis	5	10.00
Gangrene	11	22.00
Ulcer	26	52.00

Discussion

Among diabetics the lifetime risk of developing a foot ulcer is estimated to be around 15%.[9] In India, the point prevalence of foot ulcers in persons with diabetes in clinic population is 3%, which is much lower than that reported in the Western world.[10] Lower extremity disease, including peripheral arterial disease, peripheral neuropathy, foot ulceration, or lower extremity amputation, is twice as common in diabetic persons compared with non-diabetic persons and it affects 30% of diabetic persons who are older than 40 years.[11] Formulation of treatment strategy and its course develops through a better understanding of variables associated with the disease.

In present study, age of patients with diabetic foot ulcers ranged from 15 to 67 years with a mean age of 49.28±12.79 years. Overall 76% patients were above 40 years of age. Mean age of patients of diabetic foot in some of the hospital based case series stands as 50.72 years, 53.9 years, 55.26 years, 58.33 years, 61 years and 62.97 years respectively [12-17]. The mean age of patients in different series varies owing to probable difference in time of diagnosis, level of glycemic control, availability of treatment options and environmental variants. Our study was carried out in a hospital primarily catering to persons of lower socioeconomic class and from rural areas.

Majority of patients were males (60%), from rural areas (56%), the dominating role of males over females has been highlighted in epidemiological studies of diabetic foot that in general have consensus that males are relatively at a higher risk of diabetic foot ulceration as compared to females.

A higher prevalence of rural patients in present study might be owing to proximity of our facility to the rural areas. A higher proportion of rural patients could be owing to increased susceptibility to complicated diabetic foot problems such as infection in rural environment. As far as occupation is concerned, in present study manual workers or housewives (76%) dominated the scene. This group is generally more prone to diabetic foot risk exposure owing to the nature of their occupation wherein they have to generally work barefooted without any protection. Pain (72.00%) was found to be most common presenting feature, followed by history of trauma (70.00%), ulcer (40.00%), claudication (24.00%) and recurrent infection (16.00%). Pain probably seems to be the most common cause of all patient visits to a healthcare facility, diabetic foot being no different, though in diabetic foot patients pain is a feature of advanced disease as it progresses silently painlessly and perception of pain comes only at advanced stage when progressive pathology leads to pain at rest, ulceration on foot margins, digital necrosis, and gangrene.

Hypertension was noticed as comorbidity in 14% patients whereas peripheral neuropathy was noticed in 30% patients. Presence of peripheral neuropathy is a frequent finding in diabetic foot patients as neuropathy is involved in the pathogenesis of diabetic foot itself. In present study, majority of patients were vegetarian (72.00%). Although vegetarian diet has been proposed to have a preventive as well as therapeutic effect on diabetes18, whether it has a regressive or progressive effect on diabetic foot ulcers is yet to be reported. Given the large proportion of vegetarian patients with diabetic foot ulcer in present study no such relationship could be envisaged. Habit of smoking was reported by 38.00% patients while 18% patients reported of taking alcohol, all the patients having habit of alcohol intake were smokers too. In contemporary literature, adverse habits such as tobacco (smoking or chewing) or alcohol use have been reported abundantly among diabetic foot patients. In present study, 48% patients were anemic and 14% were obese. Both these conditions have been indicated to confound for treatment outcomes and that management of diabetic foot ulcers in overweight and obese patients is longer. Duration of treatment ranged from 0-10 years (median: 2 years), mean duration of treatment in study population was 2.73±2.63 years. The findings in present study indicate an earlier onset of diabetic foot problem in our patients. However, we must not forget that the present study was carried out in a socio-economically compromised population dominated by rural inhabitants and manual workers from socially unprivileged class where even diagnosis of diabetes is made at an advanced stage unlike the western and urban population where diabetes and lifestyle disorders are monitored regularly. The most common area of foot involved was dorsum (30.00%) followed by toe (22.00%), sole (18.00%), web (14.00%), heel (6.00%), foot (2.00%), other areas were involved in (8.00%). The difference in site of ulceration is dependent on etiology. When a patient presents with ulceration on the dorsum of the foot, it is due to trauma. When presentation is on the side of the foot, it is most likely due to ill-fitting shoes. In present study most common local foot complication was ulcer (52.00%) followed by gangrene (22.00%), abscess (12.00%), cellulitis (10.00%) and blister (4.00%).

Conclusion

Diabetic foot is a major health problem in diabetic patients. In upper hills of Himachal Pradesh majority of patients with diabetic foot belong to rural areas and of low socioeconomic class. Majority of these are young smokers and vegetarians. Most of the patients were suffering from diabetes for more than 2 years and hypertension was the most common co morbid condition associated. The patient presented most commonly with ulcer over the dorsum and less frequently gangrene, abscess, cellulitis and blisters were observed.

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