



PROSPECTIVE STUDY OF CLINICAL CHARACTERISTICS OF DIABETIC FOOT IN TERTIARY CARE CENTRE OF UTTARAKHAND

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ABSTRACT

Aim- Patients with diabetic foot have complications and invariably have other co-morbidities that affect quality of life. The aim of this study was to identify some clinical characteristics and their management outcome.

Material and method-Case notes of 106 patients referred to general surgery department of SGRRIMHS,Dehradun for diabetic foot were included in this study.

KEYWORDS : diabetic foot ,clinical features,complications ,management outcome .

Introduction –The prevalence of diabetes worldwide was estimated to be 2.8% in 2000 and is projected to be 4.4% in the year 2030, with the total number of people with diabetes expected to rise from 171 million in 2000 to 366 million in 2030. [1] Approximately 42 million cases are reported in India and India is ranked first in the list of the ten nations most affected with diabetes.[2,3]Among diabetes mellitus related complications; approximately 15% of diabetic patients during their life time are affected by foot ulceration (the most common complication of diabetes). [3] Among non-traumatic lower extremity amputations, DF is the main cause,[4] and precedes 85% of the cases. [5] The development of a foot ulcer is considered to result from combination of peripheral vascular disease, peripheral neuropathy and infection. [6] The pathogenesis of diabetic neuropathy is still poorly understood. The aim of this prospective study was to identify some of these clinical characteristics

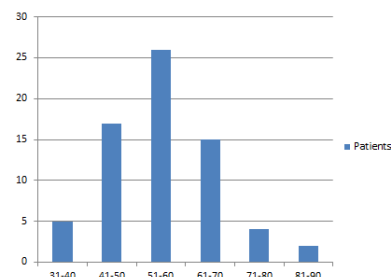
Material and method-The present study was conducted in the Department of General Surgery, Shri Guru Ram Rai Institute of Medical and Health Sciences, Dehradun over a period of 12 months and total 106 patients, having diabetic foot were included. In patients, presenting with diabetic foot; the surrounding tissue were examined for presence of blisters, cellulitis, erythema, abscess, gangrene, sinuses,osteomyelitis. Patients with chronic foot ulcers due to disorder other than Diabetes mellitus were excluded. After admission a detailed clinical history of the patient was recorded including their age, gender, history of smoking, duration and type of diabetes, with a special emphasis on ulcer and its characteristics.

Ulcers were inspected for slough, any discharge, foul smell, bullae and, Grading of ulcers were done using Wagener grading. Peripheral neuropathy was confirmed or ruled out using tuning fork (128 hz).The diagnosis of vascular insufficiency was made if both ,weak or absent pedal pulses of the involved foot and/or colour Doppler suggestive of vascular insufficiency. Osteoarthropathy was clinically assessed and on suspicion of osteomyelitis; X-ray foot was done.

Results- Our study had total 106 patients, out of which 86(81.13%) were males and 20 (18.87%) were females. Maximum number of patients belonged to 51-60 years (37.73%) age with mean age of 56.04+_10.31years.

Assessing duration of diabetes, mean duration of diabetes was 7.9 years. Most of the patients were nonsmoker (62.26%).In 8 patients, spreading infection was present upto mid-thigh. In 7 patients, infection was present up to the leg, not extending beyond the knee. Rest of the 91 patients had infection only in foot. In 39 patients

(36.79%) dorsum of foot was involved, in 58 patients (54.71%) planter surface was involved and in 9 patients (8.49%) both surfaces were involved. The American Diabetes association recommended that glycosylated Hb values below 7.0% should be the cutoff levels for good glycemic control. According to these guidelines, out of 106 patients 56, 75.47% patients had poorly controlled diabetes. Level of Hb less than 12 gm% is considered as anemia.In our study total 62 (58.49%) patients were found anemic.Ulcers were graded according to Wagener grade. Out of 106 patients, the majority of ulcers belonged to grade 3 and grade 4 of Wagener, i.e. 44 .33% and 28.30% respectively. Peripheral neuropathy was assessed during the history by features of pain,tingling or loss of sensations in the limb. It was further assessed by clinical examination of sensations by 128- Hz tuning fork (vibration senses).Out of 106 patients, 80 (75.47%) patients had peripheral neuropathy. Arteriopathy was defined by clinical absence of peripheral pulses and/or Color Doppler of lower limb showing compromised vascular flow.67 out of 106 (63.20%) patients had arteriopathy. Osteomyelitis was diagnosed by x-ray of diseased foot. Total 30 (28.30%) patients had osteomyelitis. Clinical features associated to diabetic foot were edema (13.20%), cellulitis (24.52%), blisters (44.33%), abscess (28.30%), gangrene (29.24%), and sinus was not present in any case. Out of 106 patients,16.03% required only dressings while 83.97% needed surgical interventions in form of; abscess drainage, debridement, bone curettage, amputations, grafting, flap coverage.



DISCUSSION- Since the earliest descriptions by Aretaeus of Cappadocia in the 2nd century AD, "Diabetes is a dreadful affliction, not very frequent among men, being a melting down of the flesh and limbs [sic] into urine...life is short, unpleasant and painful"; [7] This study was conducted on 106 patients admitted with diabetic foot,with proper inclusion criteria. This study group consisted of 86 males and 20 females, which accounted to 81.13% and 18.87% respectively. According to a study conducted by

Gadepalli Ravisekhar et al [8], males were predominant (85%) which correlates with this study. The greater percentage of males in this study may be due to males selectively presenting to health services or due to males being more exposed to foot trauma in the outdoors. The maximum number of patients (38.73%) was in the age group of 51-60 years the mean age was 56.04 ± 10.31 years which correlates with the study conducted by Gadepalli Ravisekhar et al [8] and study by Llanes et al. [9] in which it was 53.9 ± 12.1 years. Madanchiet al. and Raymundo and Mendoza with mean age 59.3 ± 11.2 and 56 ± 28.2 , respectively showed age group of patients [10, 11]. Henceforth, it implies that foot infections are more common in elderly. In another study conducted by Shanmugam Priya darshini et al [12], the maximum numbers of patients were in the age group of 60-65 years. The reason for this discrepancy could be due to different geographical locations where these studies were conducted. In this study, out of 106 patients, 62.66% were non-smokers. In a study conducted by Yerat and Rangaswamy, smokers were 30.76% [13]. This indicates that a set of population which presented to a tertiary care hospital of Uttarakhand was more habitual smokers. Measurement of glycosylated hemoglobin is the standard method for assessing long term glycemic control [14]. Patients with satisfactory glycemic control were defined as those having glycosylated hemoglobin of less than 7 at admission. The complications are influenced by not only by duration of diabetes but also by the average level of chronic glycemic, which is measured most reliably with the glycosylated hemoglobin assay [15, 16, 17]. In our 75.47% patients had poorly controlled diabetes. i.e., majority of patients in had long term uncontrolled hyperglycemia. In study conducted by Bansal Ekta et al, 64% patients had poor glycemic control [18]. Nahid Rouhipour et al [19] showed that 62.9% patients had poor glycemic control. Anemia is a common accompaniment to diabetes. The estimated prevalence of anemia depends on essentially arbitrary criteria used to define the presence or absence of anemia. Using World Health Organization recommended definition of anemia, nearly one in four patients with diabetes 2 (23%) has anemia warranting evaluation [20]. In our study, we found anemia to be common in patients with diabetic patients. 58.49% patients were found anemic, result also correlates with the studies conducted by Wright J.A. et al. in London [21] and Sinha Babu A et al. [22] at JIPMER Pondicherry, according to which 59.3% and 55% diabetic patients were classified as anemia by definition (Hemoglobin < 12g/dl) respectively. Ulcers were graded according WAGNER classification. Out of 106 patients, the majority of ulcers belonged to grade 3 and grade 4 of Wagener, i.e. 44.33% and 28.30% respectively. This shows that there is lack of awareness among patients about diabetic foot ulcers and they present late in the hospital. These findings correlate with study conducted by Bansal Ekta et al. [18]. Study conducted by Yerat and Rangaswamy, majority of patients had grade 4 ulcers [13]

Diabetic neuropathy is one of the most common complications of diabetes and may be the first presenting feature [20]. Peripheral neuropathy was assessed during the history by features of pain, tingling or loss of sensations in the limb. It was further assessed by clinical examination of sensations by 128-Hz tuning fork (vibration senses). Out of 106 patients, 80 (75.47%) patients had peripheral neuropathy. Study conducted by Bansal Ekta et al. [18], neuropathy was present in 76% patients but in study conducted by Gadepalli Ravisekhar [8] peripheral neuropathy was present in 86.2% patients. Diabetic arteriopathy was defined clinically with absent peripheral pulses and with the help of ultrasound arterial Colour Doppler. 67 out of 106 (63.20%) patients had arteriopathy. In a study by Bansal Ekta et al. [18] Gadepalli Ravisekhar [8] arteriopathy was present in 57% and 85.2% respectively. The discrepancy in the result by Gadepalli Ravisekhar may be due to long duration of diabetes i.e. 11.8 mean years of diabetes in the study group while in this study mean years of diabetes were 7.9 years. In our study; ulcer were examined for presence of necrotic tissue, ulcer discharge and presence of granulation. In our study; 44 ulcers had slough (58.6%), 42 had foul smelling discharge and only 10 patients had healthy granulation. In a study by Gadepalli [8], ulcers were necrotic in 23.8% cases. This finding do not correlate with previous

studies, the cause may be lack of awareness toward foot care and delayed presentation in the hospital. In our study, patients having DFU were included. At time of admission, patient's may had associated clinical features like cellulitis, erythema, bullae, abscess, gangrene also. Clinical features associated to diabetic foot were edema (13.20%), cellulitis (24.52%), blisters (44.33%), abscess (28.30%), gangrene (29.24%), and sinus was not present in any case. Osteomyelitis was diagnosed by x-ray foot; showing sequestrum, involucrum, soft tissue abnormality and thinned out cortex. In our study, Total 30 (28.30%) patients had x-ray findings suggestive of osteomyelitis. These findings correlate to study conducted in Australia, in which 25.6% foot x-ray had finding of osteomyelitis [23]. But study conducted by Oyibo et al. showed that only 5.4% patients had osteomyelitis based on x-ray findings [24]. The cause may be that in our study most of the ulcers were in grade 3, grade 4 (WAGENER GRADE) which may increase the chances of development of osteomyelitis. Diabetic foot ulcers treatment requires decreasing the infection and wound management. This can be achieved by dressings and surgical interventions. Out of 106 patients, 16.03% required only dressings while 83.97% needed surgical interventions. In the study conducted by Gadepalli, 71.2% patients required surgical interventions [8].

Conclusion- Diabetic foot and associated complications are common in Uttarakhand hilly areas due to lack of awareness and access to health care services, this leads to higher cost of treatment and ultimately many cases end up with amputation. Our study shows that proper diabetes management, patient education and early interventions can avoid such complications and can improve quality of life.

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