ISSN: 0975-3583,0976-2833 VOL14, ISSUE 02, 2023

ORIGINAL RESEARCH

Assessment of surgical complications and management of diabetic foot

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Received: 18 December, 2022 Accepted: 22 January, 2022

Abstract

Background: Diabetes is a chronic disease that occurs when the pancreas don't produce enough insulin or when body cannot effectively use the insulin when it produces. The present study was conducted to assess surgical complications and management of diabetic foot.

Materials & Methods: 90 diabetes patients of both genders were included. Patients with diabetic ulcer foot were treated with conservative treatment, split skin graftingand amputation.

Results: Out of 90 patients, males were 50 and females were 40. Ulcer was seen in 45, gangrene in 30 and cellulitis in 15 patients. Bacteria isolated was staph aureus in 42, anaerobic cocci in 30, streptococci in 5, Proteus in 12, gram negative organisms in 6 and Klebsiella in 5 cases.

Conclusion: Bacteria isolated was staph aureus, anaerobic cocci, streptococci, Proteus, gram negative organisms and Klebsiella. Management done was debridement, split skin grafting, amputation of toes and transmetatarsal amputation.

Key words: Staph aureus, Diabetes, split skin grafting

Introduction

Diabetes mellitus is a group of physiological dysfunctions characterized by hyperglycemia resulting directly from insulin resistance, inadequate insulin secretion, or excessive glucagon secretion.[1] Type 1 diabetes (T1D) is an autoimmune disorder leading to the destruction of pancreatic beta-cells.[2] Type 2 diabetes (T2D), which is much more common, is primarily a problem of progressively impaired glucose regulation due to a combination of dysfunctional pancreatic beta cells and insulin resistance.[3]

According to WHO, diabetes is a chronic disease that occurs when the pancreas don't produce enough insulin or when body cannot effectively use the insulin when it produces.[4] Diabetic foot ulcers are a growing problem in the diabetic community.[5] Globally, diabetes mellitus has grown to pandemic proportions, affecting 194 million people worldwide and is expected to increase in prevalence to 344 million by the year 2030. Of these patients, between 2 and 6% will develop a diabetic foot ulcer (DFU) yearly.[6] The onset of a DFU often precipitates a complex chain of events that may lead to limb loss. The long- term outcome for a diabetic patient after a major limb amputation is grave, with 50% of these patients deceased at 5 years.[7]The present study was conducted to assess surgical complications and management of diabetic foot.

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Materials & Methods

The present study comprised of 90 patients of diabeticfoot infection of both genders. All gave their written consent for the participation in the study.

Data such as name, age, gender etc. was recorded. General physical and systemic examination was carried out. Routine investigations such as complete blood counts, fasting and post prandial blood sugar levels, ESR, ECG, complete urine examination was done. Patients with diabetic ulcer foot were treated with conservative treatment, split skin graftingand amputation. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 90		
Gender	**Males**	**Females**
Number	50	40

Table I shows that out of 90 patients, males were 50 and females were 40.

Table II Assessment of clinical presentation

Clinical presentation	Number	P value
Ulcer	45	0.05
Gangrene	30	
Cellulitis	15	

Table II, graph I shows that ulcer was seen in 45, gangrene in 30 and cellulitis in 15 patients. The difference was significant (P< 0.05).

Graph I: Assessment of clinical presentation

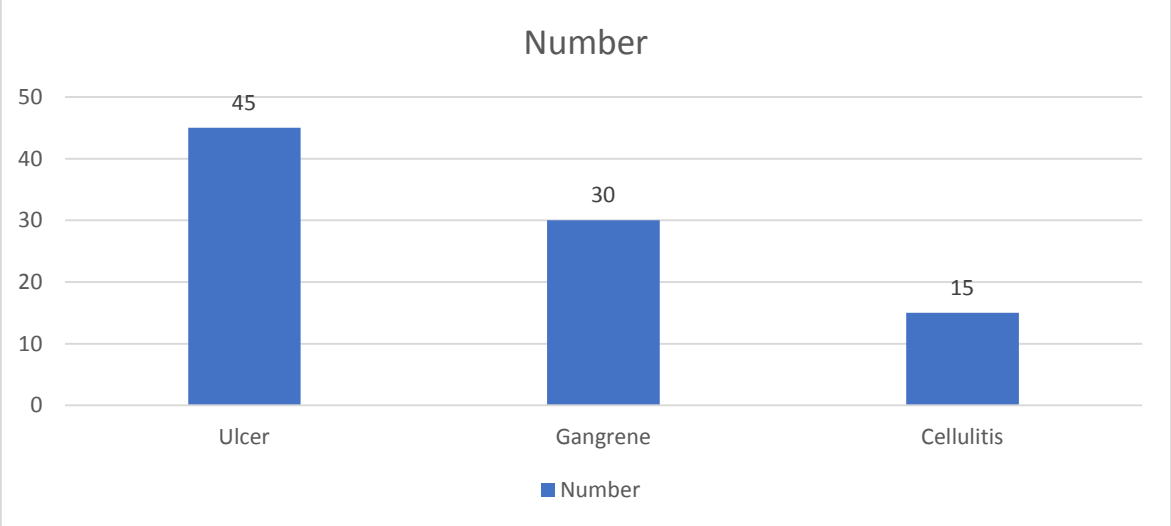

Table III Assessment of bacteria isolated

Bacteria isolated	Number	P value
staph aureus	42	0.01
anaerobic cocci	30	
streptococci	5	
Proteus	6	
Gram negative organisms	4	
Klebsiella	3	

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Table III shows that bacteria isolated was staph aureus in 42, anaerobic cocci in 30, streptococci in 5, Proteus in 6, gram negative organismsin 4 and Klebsiella in 3 cases. The difference was significant (P< 0.05).

Table IV Management of cases

Management	Number	P value
Debridement	24	0.05
split skin grafting	38	
amputation of toes	18	
Transmetatarsal amputation	10	

Management done was debridement in 24, split skin grafting in 38, amputation of toes in 18 and transmetatarsal amputation in 10 cases. The difference was significant (P< 0.05).

Discussion

Foot infections can be classified in several ways: by the depth of the infection and its severity, by the anatomic site affected, by the tissues involved, and by the causative factors, including any arterial insufficiency.[8,9] To ensure an optimal outcome, the surgeon must also possess an understanding of the microbiology and pathophysiological behavior of infection, wound management principles, and foot biomechanics.[10]The present study was conducted to assess surgical complications and management of diabetic foot.

We found that out of 90 patients, males were 50 and females were 40.Ravitheja et al[11] found that commonest presenting lesion was ulcers (64%), followed by cellulitis (20%), and gangrene (16%). Trauma is the initiating factor in most of the cases. Out of which 82% of patients had infection. Most common microorganism grown from wound discharge culture was staphylococcus aureus (56%), 86% of patients were treated with wound debridement, 14% of patients underwent amputation. Prognosis was good in all patients.

We found that ulcer was seen in 45, gangrene in 30 and cellulitis in 15 patients. Madan et al[12]study was carried out on 100 patients with diabetes mellitus with associated surgical complications. The average age of the patients was 65 years. It is implied that the most common age group is 61–70 years and the least common is older than 70 years. Sex Incidence In the present series of 100 cases, 70 were males and 30 were females. About 60% of the patients belonged to either the middle or the upper class, and about 40% belonged to the low-income group. In this area, most of the people are agriculturists and are ignorant of the sequel of diabetes mellitus.

We found that bacteria isolated was staph aureus in 42, anaerobic cocci in 30, streptococci in 5, Proteus in 12, gram negative organismsin 6 and Klebsiella in 5 cases. Armstrong et al[13]compared the efficacy of a TCC and removable cast walker and half-shoe in patients with diabetic foot ulcers. It was found that TCC to be the most effective modality. Hyperbaric Oxygen (HBO) has been found to be a useful adjunctive therapy for DFUs and is associated with decrease in amputation rates.

Surgical debridement must be considered a minor surgical procedure, with all of its possible complications. During any surgical procedure, the patient must be protected from feeling any pain. Apart from the discomfort to the patient, pain causes inadvertent motion, with consequent unintended damage. Unless the patient has severe sensory neuropathy, local anesthesia must be used. The surgeon must take into consideration the anatomic boundaries; unnecessary damage to healthy neigh boring structures may lead to the loss of the limb. On the other hand, removal of all dead tissue is mandatory.[14]

Eneroth et al[15] demonstrated that deep foot infections in diabetic patients are a heterogeneous entity, and the type of infection is related to the outcome. Amputation was required more

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 02, 2023

often for patients with deep soft-tissue infection, eitheralone or in combination with osteomyelitis, than for those with osteomyelitis alone.
The limitation the study is small sample size.

Conclusion

Authors found that bacteria isolated was staph aureus, anaerobic cocci, streptococci, Proteus, gram negative organisms and Klebsiella. Management done was debridement, split skin grafting, amputation of toes and transmetatarsal amputation.

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