

Sinbad Scoring System Predicting The Risk Of Amputation In Diabetic Foot Ulcer Patients

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Abstract

Diabetic foot ulcers are a major source of concern for diabetic patients due to their severity and inability to heal. 70% of diabetic foot ulcers remain unhealed after 20 weeks of treatment, 60% of them become infected, and of these, 20% end in different levels of amputation. The present study was intended to assess the role of the SINBAD scoring system in predicting the risk of amputation in diabetic foot patients.

METHODOLOGY It is a prospective study conducted in MEENAKSHI MEDICAL COLLEGE HOSPITAL AND RESEARCH INSTITUTE for a duration of 2 the years 2020 to 2022, with the source of study being, a total of 150 patients admitted to the general surgery ward with diabetic foot ulcers presented during the study period. According to the SINBAD classification system scoring, diabetic foot ulcers were done.

RESULTS Most of the patients were males (65.3%) and the male-female ratio was 1.8:1 in this study. The mean age is noted as 60 years and in females, the mean age is 55.3 years. In this study, the size of the ulcer was greater than 1cm in the majority of patients (92.66%). Most ulcers were superficial (82%) and were present on the forefoot. Most of the patients had a SINBAD score of 2 (74.67%) and all the patients with a SINBAD score of 2 recovered by healing without amputation. In this study patients with a SINBAD score greater than 3 had a 100% risk of amputation.

CONCLUSION The outcome and the risk of amputation in diabetic foot ulcer patients, increase with the increasing scores on SINBAD scoring system.

KEYWORD Diabetic foot ulcer, Risk of amputation, SINBAD scoring system.

INTRODUCTION

Approximately 1 in 4 patients with diabetes will develop a foot ulcer in their lifetime. For good results, early identification of infection and appropriate management using antibiotics and wound debridement must be given.

Avoiding unnecessary amputation is the primary goal of managing diabetic foot disease, and most interventions for managing these patients focus on the restoration of tissue perfusion and infection control.

Type 2 diabetes mellitus patients and Hypertensive male patients with a history of smoking habits are most prone to develop neuro ischemic ulcers.

A multidisciplinary approach to diabetic foot disease has been demonstrated to be the most effective strategy to reduce the rate of amputation and mortality.

The SINBAD system grades area, depth, sepsis, arteriopathy and denervation plus sites as either 0 or 1 points, creating an easy-to-use scoring system that can achieve a maximum of 6 points as follows;

Table 1. The SINBAD system for classifying and scoring foot ulcers

Category	Definition	SINBAD Score
Site	Forefoot	0
	Midfoot and hindfoot	1
Ischaemia	Pedal blood flow intact, one pulse palpable	0
	Clinical evidence reduced pedal blood flow	1
Neuropathy	Protective sensation intact	0
	Protective sensation lost	1
Bacterial Infection	None	0
	Present	1
Area	Ulcer <1cm ²	0
	Ulcer >1cm ²	1
Depth	Ulcer confined to skin and subcutaneous tissue	0
	Ulcer reaching muscle, tendon or deeper	1
Total possible score		6

Source: Adapted from Ince et al (2008)



Right diabetic foot site-1, area >1cm, with a score of 2, wound healing without amputation.





Left diabetic foot - site- midfoot -1, ischemia -1, neuropathy- 1, area - 1, depth-1, a score of 5, higher the score need for amputation.

METHODS

It is a prospective study with the study period being 2years from 2020 to 2022. The study is planned to be conducted on both an inpatient and outpatient basis at MEENAKSHI MEDICAL COLLEGE AND HOSPITAL RESEARCH INSTITUTE, Enathur.

The sample size of 150 patients with diabetic foot ulcers was studied. The study was conducted on 150 patients fulfilling the selection criteria during the study period.

INCLUSION CRITERIA

Patients having diabetic foot ulcers secondary to diabetes mellitus.

EXCLUSION CRITERIA

1. A patient who had an ulcer previously at the same site.
2. Foot ulcer secondary to venous and arterial disorder other than diabetes mellitus.

The study was approved by the ethical and research committee.

Informed consent- patients with diabetic foot ulcers were evaluated and those fulfilling the selection criteria were informed about the nature of the study and written informed consent was obtained.

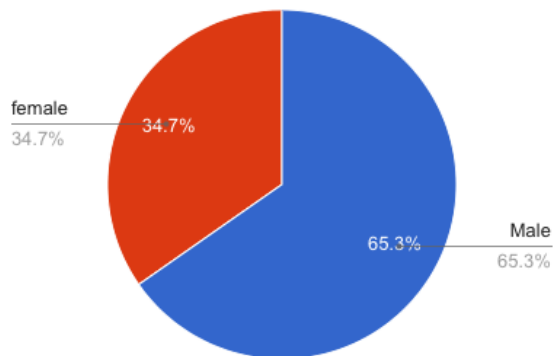
RESULTS

The patients were scored according to the SINBAD scoring system and managed with strict glycemic control, daily dressing, debridement and amputation if needed.

1. Gender distribution

s.no	Gender	frequency N=150	percentage
1	Male	98	65.3
2	Female	52	34.7
3	Total	150	100

Gender distribution

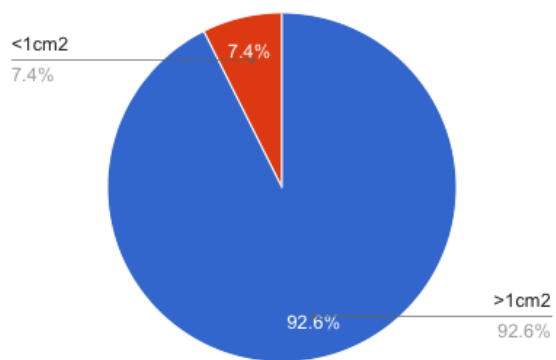


In the present study, 65.3% of the patients were males and 34.7% were females. The male-to-female ratio was 1.88:1. In this study, the mean age in males was 60.0 years with a range of 32 being minimum and 85 being maximum and in females, the mean age was 55.3years with a range of 32 being minimum and 79 being maximum.

2. Size of ulcer

s.no	size of ulcer	frequency N=150	percentage
1	>1cm ²	139	92.6
2	<1cm ²	11	7.4
3	Total	150	100

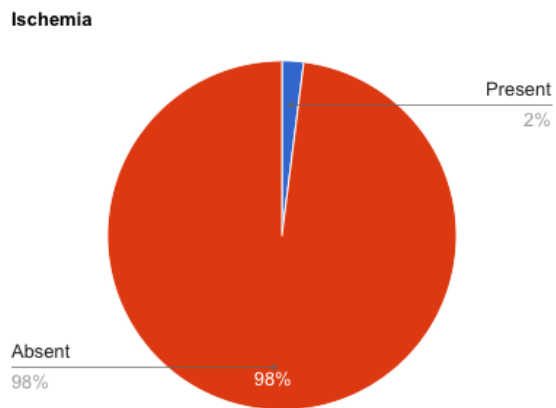
Size of ulcer



In this study, the size of the ulcer was greater than 1cm² in 92.66% of patients.

Ischemia

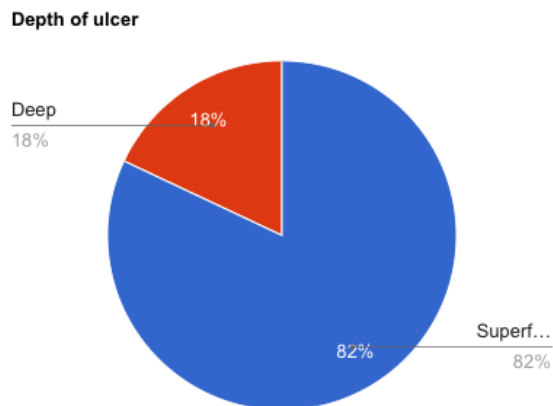
S.no	Ischemia	frequency N=150	Percentage
1	present	3	2
2	absent	147	98
3	total	150	100



In this study, ischemia was present in 2% of cases.

Depth of ulcer

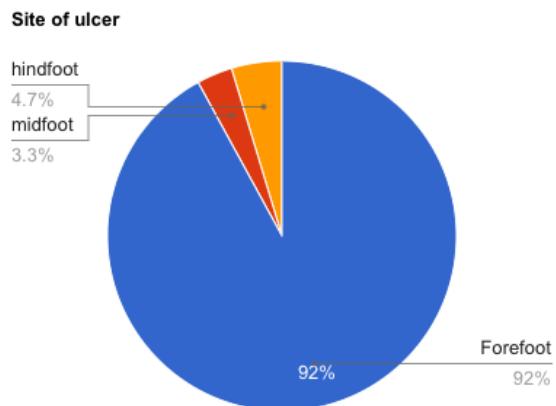
s.no	Depth of ulcer	Frequency N=150	percentage
1	superficial	123	82
2	deep	27	18
3	total	150	100



In the present study depth of ulcer was superficial in 82% of the patients and deep in 18% of patients.

Site of ulcer

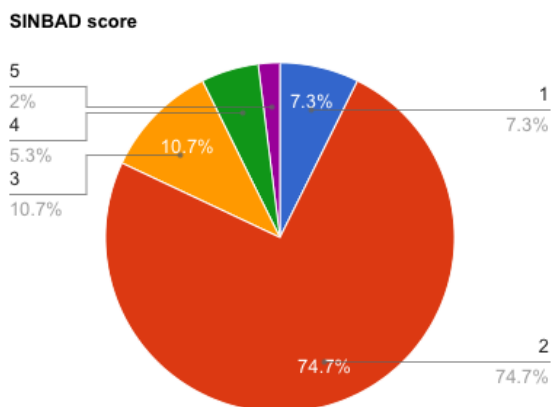
s.no	site of ulcer	frequency N=150	percentage
1	fore-foot	138	92
2	mid-foot	5	3.33
3	hind-foot	7	4.67
4	total	150	100



In this study, 92% of the patients had ulcers over their forefoot.

SINBAD score

S.no	SINBAD SCORE	Frequency N=150	percentage
1	1	11	7.33
2	2	112	74.67
3	3	16	10.67
4	4	8	5.33
5	5	3	2
6	total	150	100



In the present study based on the SINBAD scoring system, most of the patients (74.67%) had a score of 2 followed by 3 (10%), 1 (7.33%), 4 (5.33%), 5 (2%) and 6(0%).

In this study, 70.67% of the patients needed debridement followed by dressing in 22%, and amputation in 7.33%.

OUTCOME

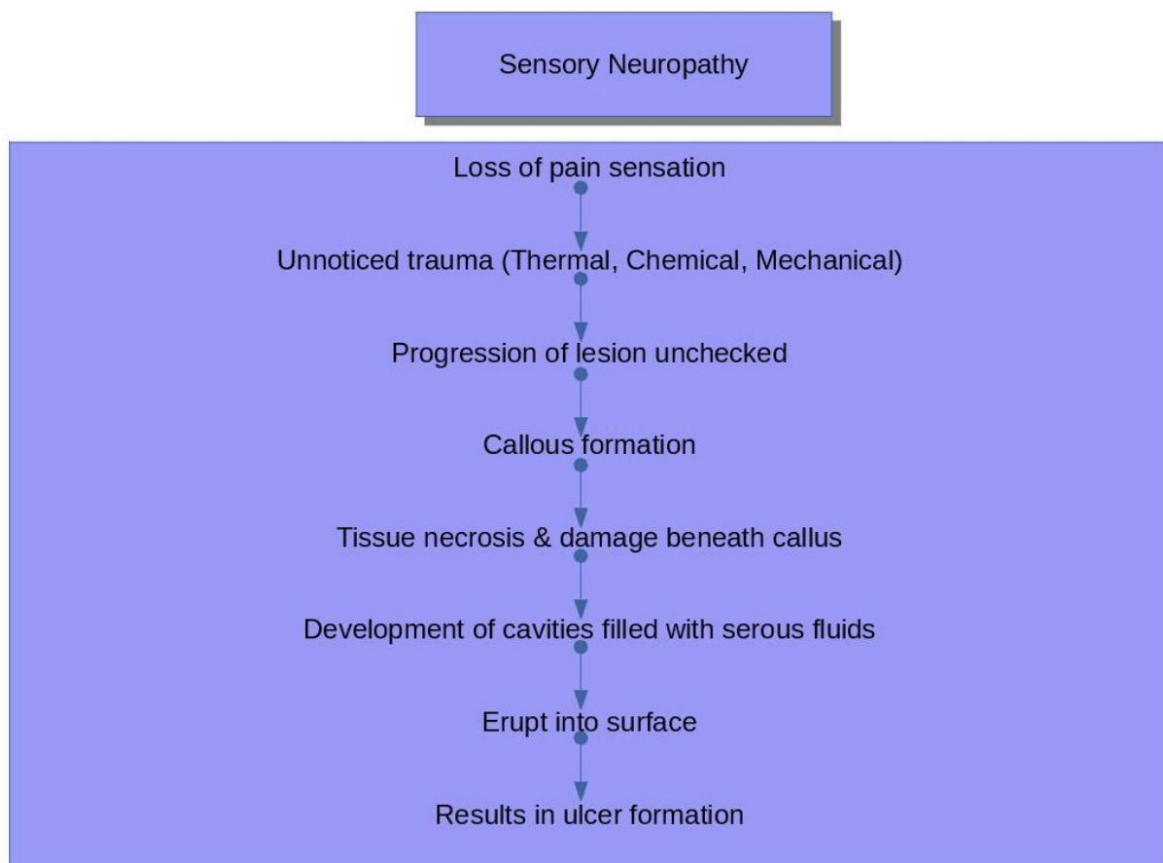
(*P VALUE <0.05 IS STATISTICALLY SIGNIFICANT).

In the present study maximum number of patients presented with a SINBAD score of 2 (74.67%). Among them, 100% of the patients had healed without amputation. As the SINBAD score increases, the percentage of patients going for amputation increases.

DISCUSSION

How diabetic patients develop foot ulcers:

1. Presence of neuropathy– This will lead to dry skin with cracks, foot deformities, and loss of sensation in the foot.
2. Presence of Micro angiopathy – This is going to cause a decreased blood supply to the foot which is making the foot more susceptible to ulcerations.
3. Presence of Immunopathy will cause defective Leukocyte function, adherence, and chemotaxis.



CLINICAL PRESENTATION OF DIABETIC FOOT PATIENTS :

1. They will present acutely with superficial to deeper soft tissue infections ranging from cellulitis, Necrotising fasciitis
2. They may present with chronic non-healing ulcers
3. Gangrene – they may have dry or wet gangrene
4. Infection of bone – osteomyelitis
5. Joint infections like septic arthritis

The Wagner ulcer classification system is a widely accepted classification for diabetic foot ulcers, which is based on the depth of penetration, the presence of osteomyelitis or gangrene, and the extent of tissue necrosis.

The drawback of the Wagner classification system is that it does not adequately address all diabetic foot ulcerations and infections and only Grade 3 (of the 6 grades) infers infection.

Further, the system is limited in its ability to identify and describe the vascular disease as an independent risk factor. In addition, superficial wounds that are infected or dysvascular are not able to be classified by this system. These factors are overcome to an extent in the SINBAD classification.

CONCLUSION

In this study, SINBAD scoring system for diabetic foot ulcers affects and predicts the outcome and the risk of amputation increases with an increasing score.

Most diabetic foot ulcer patients have a SINBAD score of 2 (74.67%) of which 100% of patients recovered by healing without amputation in our hospital.

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