

A clinical study of ulcers of the foot at a tertiary care hospital

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Abstract

A chronic ulcer of the foot is a frequent condition, with prevalence in the population over 60 years of age. The incidence of ulcers is rising as a result of the ageing population and increased risk factors for atherosclerotic occlusion such as smoking, obesity and diabetes. Ulcers can be defined as 'break in the continuity of the covering epithelium either skin or mucous membrane due to molecular death'. Prospective study of 100 cases of chronic foot ulcers admitted at Tirunelveli medical college Hospital, Tirunelveli, during the period March 2011 to March 2012, with regular dressing, debridement, treating the underlying systemic disease, skin grafting and amputation were done. In a study group of 100 cases, most of the patients with leg ulcers had an underlined systemic disease such as diabetes mellitus, varicose veins, arterial occlusion secondary to atherosclerosis, leprosy and malignancy.

Keywords: Chronic non-healing ulcer, diabetic leg and foot ulcer, varicose ulcer, tropic ulcer, arterial ulcer, malignant ulcer

Introduction

Chronic ulcers of the lowerlimb is frequent condition and wide in distribution they may be associated with a number of Medical, Surgical & Dermatological condition, most commonly dealt with and treated in the surgical wards and OPD ^[1].

The incidence of ulcers is more in aging population and increased risk factor for atherosclerotic occlusion such as smoking, obesity and Diabetics.

Ulcer can be defined as 'break in the continuity of the covering epithelium either skin or mucous membrane due to molecular death', In general the slow healing tendency is not simply explained by depth and size. But caused by a underlying pathologic fact that needs to be removed to induce healing ^[2].

The problems of lower limb ulcer represent a wide spectrum of etiology, pathology, severity and morbidity. The main causes are varicose veins, lower extremity arterial disease and diabetes. Less frequent conditions are infections, vasculitis, skin malignancies and ulcerating skin diseases such as pyoderma gangrenosum. But even rare condition exists such as recently discovered combination of vasculities and hypercoagulability. For a proper treatment of patients with lower limb ulcers, it is important to be aware of the large differential diagnosis

and different causes of foot ulcers. The causes may be various but the anatomical situation of ulcers in the foot by itself can give rise to problems that can at times test the ingenuity and patience of the surgeons [3].

Various studies have been conducted and a number of procedures and techniques have evolved with varying degree of success. It is common to see patients with different types of ulcers due to various etiology and underlying systemic diseases. Moreover, foot ulcers form a good bulk of patients in our hospital. Treatment of these ulcers forms a challenging task as well [4].

I have therefore in my present study attempted to analyze the ulcers of the foot.

This study comprises of: Review of literature with regard to historical aspects, etiology, anatomy, pathology, pathophysiology, clinical features and diagnosis of chronic foot ulcers along with the various modern investigative studies required for the diagnosis.

Methodology

A total number of 100 cases were considered for this study. This group was a diversified one and included patients of both sexes and of all ages from 12 years and above, all religion and economic strata. This study included cases of stasis ulcers, diabetics with leg ulcers, arterial ulcers and others.

A detailed history was collected with particular reference to onset, duration and type of lesion, socioeconomic strata and occupational factors and systemic diseases. Any histories of similar ulcers were also noted.

A thorough systemic and local examination was carried out. The morphological features of ulcers i.e.-number, distribution of ulcer on gaiter area or foot site and associated diseases like varicose veins, eczema or patches were noted. But while presenting only relevant positive and some important negative findings were shown to make the study brief and to avoid unnecessary repetitions.

Results

Table 1: Distribution of various types of foot Ulcers

Sl. No.	Etiological Type	No. of patients	Percentage
1.	Diabetic ulcer	48	48%
2.	Venous ulcer	26	26%
3.	Arterial ulcer	12	12%
4.	Malignant ulcer	5	5%
5.	Tropic ulcer	3	3%
6.	Other ulcers	6	6%

Among the 100 cases studied the commonest was found to be diabetic ulcer accounting for 48 cases (48%) followed by venous ulcer (26%), arterial ulcer (12%) malignant ulcer (5%), tropic ulcer (3%) and others (6%).

According to Gilliland 95% of leg ulcers are due to vascular etiology and venous ulcers dominates accounting for up 90% of the cases.

Table 2: Sex distribution of various types of foot ulcers

Sex	No. of Cases	Percentage
Male	65	65%
Female	35	35%

The above figures indicate that foot ulcers were more common in males than in females accounting for 65%. However, in other studies there has been no gross difference between male/female ratio.

Table 3: Age distribution of various types of foot ulcers

SL. No.	Age Group	No. of cases	Percentage
1.	12-20 years	1	1%
2.	21-30 years	6	6%
3.	31-40 years	8	8%
4.	41-50 years	16	16%
5.	51-above	69	69%

Incidences of foot ulcers in this study group were found to be maximum in the age group of 51 & above. Since, the patients of age group 0-12 years are taken care of under the department of pediatric surgery, they are not included in this study.

The youngest patient was 18 years old and the oldest were 84 years old. Cornwall *et al.* [5] in their study had 70% of the patients over the age of 70 years and according to a study done by Callam MJ [6] ulceration began before the age of 40 years in 22% of the patients.

Out of 100 cases studied ulcers associated with diabetes mellitus accounted for 48 cases.

Table 4: Distribution of diabetic ulcers in the foot

Sl. No.	Side	No. of cases	Percentage
1.	Right limb	18	18%
2.	Left limb	20	20%
3.	Bilateral	10	10%

From the above study, it is noted that diabetic ulcers were relatively common in the left limb accounting for 41.6% of cases.

Table 5: Location of the ulcer according to its types

Sl. No.	Type of ulcer	Gaiter Zone	Dorsum of foot	Plantar aspect	Total
1.	Diabetic	02	28	18	48
2.	Venous	23	03	0	26
3.	Arterial	0	0	12	12
4.	Malignant	0	03	02	05
5.	Others	0	01	02	03

The venous ulcers occurred more commonly in the gaiter zone (88.4%). Whereas arterial and diabetic ulcers occurred mainly in the toes and foot i.e., 100% and 95.8% respectively. About 60% of malignant ulcers of lower limb occurred in the foot.

According to Hanson Carita ulcers below the line of shoe and feet are considered mostly caused by arterial insufficiency and or diabetes. Ulcers on the gaiter zone are mostly caused by varicose veins.

Discussion

The prevalence of foot ulcers is probably between 0.18% and 1% (Phillips, Tania *et al.*) [7] 95% of lowerlimb ulcers are due to vascular etiology, (Gilliland) 7 and among all chronic wounds lower extremity venous ulcer dominates the differential diagnosis accounting for up to 90% of the cases (Burton S. Claude) [8] (Callum M.J. *et al.*) [9]. Arterial diseases account for

5% to 10%, most others are due to neuropathy or a combination of both (Yound J.R) ^[10].

In this study chronic ulcer with vascular etiology accounted for only 38% of all chronic ulcers. Out of this venous ulcers accounted for 26% and arterial ulcers accounted for 12%. Chronic ulcers associated with diabetes accounted for nearly 48%. Malignant ulcers accounted for 5% and other ulcers for 6%.

As observed above the present study was not comparable with the published studies mentioned probably because of following reasons:-

- The study group of 100 patients only hence difficult to draw any comparative conclusions.
- The other published studies were population based, controlled randomized or a group-based study which included different specialties where as this study was a nonrandomized and uncontrolled study.

Some investigators have classified diabetic ulcers as metabolic. The most important factors responsible for causation of ulcer in diabetes are the arterio-sclerotic lesions in large leg arteries and or neuropathy resulting in decreased sensation. If diabetic ulcers in our study are considered vascular disorders rather than metabolic, the percentage of vascular ulcers in our study is about 76%-somewhat comparable to the above study. However, this is controversial and in diabetes it is a combination of factors that are to be considered in causation of leg ulcers.

Also according to Yound J.R. ^[10] and Boyd A.M. *et al.*, ^[5] the distribution of different type of ulcers in different studies varies-70% to 90% for venous ulcer, 5% to 15% for arterial ulcers and 1% to 5% for other ulcers.

As per studies done by Hansson Carita ^[11] on leg and foot ulcers, ulcers below the line of shoe and feet are considered mostly to be caused by arterial insufficiency and or diabetes. Ulcers on the medial aspect of the ankle in the gaiter zone are mostly caused by venous insufficiency.

In the present study, ulcers had the same site of distribution i.e., ulcers in the gaiter zone were mostly caused by venous insufficiency and ulcers in the foot below the line of shoes were mostly caused by arterial insufficiency and or diabetes.

About 41% of patients in our study had ulcers in the foot only. This is rather high figure in comparison to Hansson's study which showed about only 30% of the ulcers in the foot. This is probably due to more number of diabetic and arterial ulcers in our study.

Cornwall *et al.* ^[12] in his study had 70% of patients over the age of 70 years. The median age of all patients in this study was 45 years and 44% of the patients over the age of 45 years and had 70% of the patient over the age of 70 years. But according to study done by Callam M.J. ^[9] the elderly are not the only population at risk: In his study ulceration began before the age of 40 years in 22% of the population studied. In our study, ulceration began before the age of 40 years in 15% of the patients.

Peripheral vascular diseases increase with age and are 7 times more frequent in 60 years old patients when compared to 20 years old. (Hansson Carita) ^[11]. In this study, arterial and venous diseases were found to be maximum in the age group of 31 to 50 years. This discrepancy may be due to the fact that, our study group patients in the above age group belong to the working class and the ulcers they suffer from hamper their working capacity making them seek medical help early. And also venous ulcers were found to be most common in the age group of 31 to 50 years which is rather early when compared to western studies as most of our patients belong to the working class which involved long hours of standing.

Conclusion

The venous ulcers occurred more commonly in the gaiter zone (88.4%). Where as arterial and

diabetic ulcers occurred mainly in the toes and foot i.e., 100% and 95.8% respectively. About 60% of malignant ulcers of lower limb occurred in the foot.

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