

Epidemiological Study of Ulcers of the Lower Limb in a Tertiary Care Teaching Institute

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ABSTRACT

Lower limb ulcers are common in old age group there are several causes which includes venous valve insufficiency, diabetes mellitus, skin malignancies. We in the present study tried to evaluate the epidemiology of population affected with lower limb ulcers and treatment and outcome of such conditions.

Methods: This cross-sectional study was conducted in the Department of General Surgery, Prathima Institute of Medical Sciences, Naganur, Karimnagar. All cases of leg ulcers reporting to this institute except those which occur due to trauma and in children < 12 years of age were included in the study.

Result: In the study n=50 cases of both sexes with leg ulcers were included. The most commonly involved age group was > 70 years. Diabetic ulcers were detected in 44% of cases in males and 18% of cases in females. In the cases right limb was involved in n=24(48%) cases and left limb was involved in n=23(46%) of cases and bilateral involvement was found in n=3(6%) of cases. The predominating organism found was *Staphylococcus aureus* followed by *Klebsiella* and *streptococcus*.

Conclusion: The study found that found to be ulcer of the leg associated with diabetes mellitus, ulcer due to venous valve incompetence. The diabetic ulcer was more common in males, more prevalent in patients above the age of 51 years. Venous ulcers are commonly seen are saphenofemoral junction incompetence and perforator incompetence. As far as the treatment of these cases is concerned the use of antibiotics and dressings helps to a great deal in management. Skin grafting may be considered with wide defects where healing is difficult without grafts.

Keywords: Ulcers, Lower limb, Epidemiological study

Introduction

The incidence of lower limb ulcers is since time immemorial. Hippocrates, Father of medicine himself had leg ulcers. He was against treating various ulcerations by surgical means. He treated multiple varicose veins by puncturing them at different levels to avoid non-healing of ulcers and about 400 years B.C. He wrote - "In the cases of an ulcer, it is not expedient to stand, especially if the ulcer be situated on the leg"^[1] In 1828 Marjolin described the carcinomatous ulcers originating from degenerative burns scars this ulcer bears his name.^[2] Avicenna

(982 - 1027AD) gave a good account of diabetes and was the first one to describe diabetic gangrene. Although the limb ulcers are common, accurate data of incidence is difficult to obtain owing to various factors such as the genetic constitution of its members, nutritional status, environmental factors, customs, and occupation. In underdeveloped countries, the incidence of a condition may be greatly underestimated and apparent differences between populations may be affected by differences in age structures. It has been estimated that the prevalence of lower limb ulcers ranges from 0.18% to 1% of the population.^[3] Most of the ulcers are venous ulcers and 90% of them are present in the gaiter area, 2% in the foot, and 8% in the leg.^[4] Women are more prone to leg ulcers as compared to men of similar age groups. Leg ulcers left untreated could result in a great degree of morbidity and mortality in cases of malignant ulcers. Hence, prompt recognition and treatment are important. Differential diagnosis of ulcer is crucial for treatment.^[1] Recently there have been considerable studies regarding the anatomy, physiology, and pathology of the chronic limb ulcers. However, treatments have been met with a variable degree of success. Therefore, the choice of treatment should also be based on the systemic conditions of the patient and the best possible therapy should be determined in each case. We in the present study evaluated the frequency of various lower limb ulcers, the type of ulcer, methods of assessment of ulcers, management, and outcome of treatment.

Material and Methods

This prospective cross-sectional study conducted in the Department of General Surgery, Prathima Institute of Medical Sciences, Naganur, Karimnagar. The protocol of the study was approved by the Institutional Ethical committee. Written consent was obtained from all the participants of the study. Inclusion criteria were patients with lower limb ulcers reporting to our department, males and females, aged >20 years and above. Exclusion criteria were patients below 12 years of age, patients not willing to participate in the study. A detailed history of the patient was collected including the onset, duration of lesion history of systemic diseases history of similar ulcers. The patients were then subjected to detailed general physical examination followed by a local examination that included the noting of the number of lesions, location, distribution, lipodermatosclerosis, and presence of associated

varicose veins, eczema, etc were noted. Signs of arterial diseases were determined by the presence of shiny, hairless, pale, or cool skin was noted. The ulcers were examined for the position, color, tenderness, temperature, shape, size, base, depth, discharge, and lymph nodes. State of local tissues including pulse, if the pulse was not felt then we used doppler for examination. Surrounding regions were examined for pain, edema, erythema, warmth, induration, discoloration, scarring, clubbing, and cyanosis. All the available data was recorded in the MS Excel spreadsheet and analyzed by SPSS version 21 on the Windows platform.

Results

In this study, a total of n=50 cases were studied out of which n=32(64%) were male patients and n=18(36%), female patients. The most commonly involved age group was > 70 years. The youngest patient in this study was 21 years and the oldest patient was 80 years. The demographic profile of the patients and distribution is shown in table 1.

Table 1: Age and sex-wise distribution of lower limb ulcers in the study

Age group [yrs]	Male	Female	Total (%)
21– 30	3	1	4 (8%)
31– 40	2	1	3 (6%)
41 - 50	5	2	7 (14%)
51 - 60	5	3	8 (16%)
61 – 70	8	4	12 (24%)
> 70	9	7	16 (32%)
Total	32	18	50 (100)

In this study, the most common cause of ulcer was diabetes mellitus which accounted for 44% of cases. Diabetic ulcers were detected in 44% of cases in males and 18% of cases in females. In the cases right limb was involved in n=24(48%) cases and left limb was involved in n=23(46%) of cases and bilateral involvement was found in n=3(6%) of cases. The diabetic ulcer was found in n=2 cases of 41 – 50 years age group, and n=5 cases of 51-60 age group and n= 7 of 61 – 70 years age group and n=8 of > 70 years age group. Out of n=13 cases of venous ulcers, the long saphenous vein was involved in n=9 cases and short saphenous in n=2 cases and n=1 cases were having both

vein involvement and deep vein involvement was seen in n=1 case. The most commonly involved age group in venous ulcers was 41 – 50 years with n=7 cases. Arterial ulcers were found in n=3 cases and all the cases of arterial ulcers were in the age group of >70 years age group. In two cases of arterial ulcers atherosclerosis was the cause and TAO was the cause in one case. Traumatic ulcers were noted in n=7 cases out of which n=5 cases were due to anemia and one ulcer was found on joint surface and another ulcer was the result of secondary infection after suturing other details are shown in table 2.

Table 2: Type of ulcer diagnosed in the cases of the study

Type of ulcer	Male	Female	Total (%)
Diabetic ulcer	13	9	22 (44)
Venous ulcer	9	4	13 (26)
Traumatic ulcer	5	2	7 (14)
Arterial ulcer	2	1	3 (6)
Malignant ulcer	1	1	2 (4)
Tropic ulcer	1	1	2 (4)
Other ulcers	1	0	1 (2)

The diabetes ulcers and arterial ulcers occur in all cases on foot and the venous ulcers occurred more commonly in the gaiter zone. These are considered as the areas of arterial

insufficiency hence more prone to ulcers. All the malignant ulcers occurred in the foot area. Venous ulcers were found in the gaiter zone which is considered as an area of venous insufficiency details given in table 3.

Table 3: Location of different ulcers in patients of the study

Type of ulcer	No. of cases (n)	Gaiter	Foot	Leg
Diabetic ulcer	17	0	15	2
Venous ulcer	12	10	1	1
Traumatic ulcer	8	0	5	3
Arterial ulcer	6	0	6	0
Malignant ulcer	3	0	3	0
Tropic ulcer	2	0	2	0
Other ulcers	2	1	1	0
Total	50	11	33	6

In all cases of ulcers, samples were sent for culture and sensitivity tests. The predominating organism found was *Staphylococcus aureus* followed by *Klebsiella* and *streptococcus*.

No growth was detected in n=9 cases shown in table 4.

Table 4: Type of microorganisms isolated from ulcers

Microorganisms	No of Cases	Percentage
<i>Staphylococcus aureus</i>	13	26
<i>Klebsiella</i>	9	18
<i>Proteus</i>	7	14
<i>Streptococcus</i>	10	20
<i>Pseudomonas</i>	2	4
No growth	9	18

Discussion

We in the current study calculated the prevalence of lower limb ulcers in the parents. Out of total n=1100 cases seen during the duration, we found lower limb ulcers in n=50 patients. Therefore the prevalence is about 0.45%. T Philips et al;^[3] found the prevalence of leg ulcer range from 0.18% to 1% of the all cases agreeing with the results of the present study. In this study chronic ulcers with vascular etiology were found in 36% of cases out of which venous ulcers were in 24% and arterial ulcers in 16% cases. Chronic ulcers related to diabetes mellitus were found in 34% of cases of the study. Gilliland et al;^[5] found 95% of leg ulcers occur due to vascular insufficiency. They found the venous ulcers are caused in 90% of cases of lower leg ulcers. Young JR. et al;^[6] and Boyd AM. et al;^[7] found the distribution of different types of ulcers in their studies, the percentage of distribution varies from 70% to 90% for venous ulcer, 5% to 15% for arterial ulcers, and 1% to 5% for other ulcers. H Carita et al;^[8] found in their study of ulcers on leg and foot. They concluded that ulcers on the medial aspect of the ankle in the gaiter zone are mostly due to venous insufficiency. We in the present study found a similar type of

distribution and ulcers in the gaiter zone were mostly due to venous insufficiency and ulcers of the foot below the line of shoes are caused by arterial insufficiency and diabetes. 66% of patients of our study were having ulcers in the foot area. H Carita et al; [8] found 30% of ulcers in the foot area. The higher percentage of prevalence of ulcers in the foot in this study could be due to a greater number of patients of Diabetes mellitus and arterial ulcers. In this study, we had 56% of cases over the age of 60 years although, ulcers were found in the youngest patient of 21 years. Peripheral vascular diseases increase with age and are 7 times more frequent in 60 years old patients when compared to 20 years old. Cornwall et al; [9] found 70% of patients aged above 70 years as an older population are at a greater risk of developing ulcers. In this study, we found arterial ulcers in the age group 41- 50 years and venous ulcers in 61 and above age group. The age of development of arterial ulcers in this study is lesser as compared to other similar studies in foreign countries which could be due to a higher number of TAO cases commonly is seen in young adult smokers. For venous ulcers in the study, we used elastic crepe bandages. [10] In this study 26% of cases

who had venous ulcer crepe bandages were used and stretched to 50% providing compression of 14mmHg under a single layer they were subjected to local dressings. After the healing of ulcers, they were taken for surgery. Out of 26% cases, 24% were due to varicose veins and 2% were due to deep vein thrombosis. All the varicose veins ulcers were treated with surgery in the form of ligation or Trendelenburg's operation and subfascial ligation. The patients of deep venous thrombosis underwent skin grafting. The mean healing time of ulcers was found to be 15.5 days. Those with skin grafts had ulcers healed in 7 days. Diabetic ulcers were treated with regular debridement and dressing and increasing the dose of insulin if required along with antibiotics. One patient had to undergo amputation in the meantime of healing of diabetic ulcers was 25.8 days. Tropic ulcers in this study were found in 4% of cases they are usually associated with leprosy, traumatic ulcers, and other ulcers following snakebite and certain infections like pyoderma gangrenosa. The commonest organisms cultured from the wounds were found to be *staphylococcus*, *streptococcus*, *pseudomonas*, and *klebsiella*, and treatment with antibiotics was done as per the sensitivity reports.

Conclusion

The study found that found to be ulcer of the leg associated with diabetes mellitus, ulcer due to venous valve incompetence. The diabetic ulcer was more common in males, more prevalent in patients above the age of 51 years. Venous ulcers are commonly seen are saphenofemoral junction incompetence and perforator incompetence. As far as the treatment of these cases is concerned the use of antibiotics and dressings helps to a great deal in management. Skin grafting may be considered with wide defects where healing is difficult without grafts.

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