

Original Research Article

Clinico-epidemiological study of chronic leg ulcers in a tertiary care referral center from Tamil Nadu, India

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ABSTRACT

Background: Leg ulcer is a common ailment of elderly presented with complex dermatological conditions. It may occur as a sequel to infection, malignancy, adverse drug reaction, trauma and hematological disorders. The paucity of data on the prevalence and outcome of the chronic leg ulcer in India served as a basis to conduct this clinico-epidemiological study. To study the prevalence of leg ulcers in a tertiary care referral hospital.

Methods: In this cross-sectional study, 100 patients with leg ulcer attending the dermatology OPD at Madras medical college, Chennai, were enrolled after obtaining their consent. Detailed case history of each patient was recorded. Routine clinical investigations, Doppler study and culture were done to detect associated complications. In this study, 58 males and 42 females, with the mean age of 42.01 ± 14.302 years, mean duration of leg ulcer of 17.79 ± 29.87 months were recruited.

Results: Venous ulcer (37%) was the most prevalent type of leg ulcer recorded in our study. Doppler study revealed that the 31% of venous ulcers patients developed perforator incompetence. *Staphylococcus aureus* was the major microbe isolated from the lesions (27%).

Conclusions: Chronic leg ulcers are very common in elderly patients and venous ulcer being the most common. Doppler is an effective tool for the assessment of disease severity of venous ulcers and aided in offering the adequate management of the disease. Diagnosis of underlying causes such as pyoderma gangrenosum, autoimmune diseases, malignancies and bacterial culture from the wound will be helpful for the management of the disease.

Keywords: Leg ulcer, venous ulcer, *Staphylococcus aureus*, Filarial ulcers, Squamous cell carcinoma, Pyoderma gangrenosum

INTRODUCTION

Leg ulcer is defined as breach in the epithelial integrity of the skin, occurring between the knee and malleoli.¹ These wounds of the skin results in either complete loss of the epidermis or with portions of dermis, sometimes including subcutaneous fat.² Ulcers of the lower limb is fairly common among middle aged people whose symptoms include pain, oedema, oozing and bleeding. Nowadays leg ulcers are at a raise due to increase in

elderly population, life style changes such as smoking, obesity and other diseases such as diabetes mellitus, hypertension.³ Leg ulcer has also been a common feature associated with infection, malignancy, adverse drug reaction, trauma and hematological disorders. Leg ulcers are frequent and often requiring dermatological advice. Without treatment, these types of ulcers can keep relapse and ensure severe complications and economic burden to the patients.⁴ A correct diagnosis is necessary to avoid inappropriate treatment that may delay wound healing,

cause worsening of the wound or harm the patient. There is a paucity of data relating to the prevalence and natural history of lower extremity wounds in Indian patients. Hence this study was carried out to establish the clinico-epidemiological data of leg ulcers in patients from South India.

METHODS

This cross section observational study was conducted in the department of dermatology, Madras, medical college, Chennai a tertiary care referral institute at Tamil Nadu. The study was approved by the institutional ethical committee. A written consent in local language was obtained from all the study participants. The inclusion of patients was restricted to those who fulfilled the following criteria: leg ulcer for a duration of more than 6 weeks, open wound at the time of study. One hundred patients fulfilling the criteria were consecutively recruited over two years from October 2011-September 2013.

A detailed history of the patients including age, sex, chief complaints, drug intake and duration of lesion were recorded in a predetermined proforma. Clinical information such as number of ulcers, morphology, site, varicose vein, hypo-pigmented patches, edema, sensory loss, oozing, bleeding were recorded for each patient. Complete blood count, fasting blood sugar, liver functions test (LFT), kidney functions test (KFT), Mantoux test, antinuclear antibody test, Rheumatoid factor, biopsy, Doppler study, culture and sensitivity were done for all the patients.

The course and duration of the disease and any other associated systemic disease was recorded. The hospitalized patients were given supportive treatment and later specific treatment was instituted for the underlying dermatoses.

RESULTS

Out of 100 patients enrolled in this study, 58 (58%) were males and 42 (42%) were females. The observed male: female ratio was 1.4:1. The average age of patients at the time of enrollment was 42.01±14.302 (Mean ±SD) years. The observed standard error of mean was 1.43. The median age was 40.5 years. Patients aged between 19 to 74 years were observed to have developed leg ulcers. The mean duration of leg ulcer was 17.79±29.87 months. The minimum duration of disease course was 6 weeks and the maximum was 2 years. The detailed demographic features of the study subjects are depicted in Table 1.

Classification of leg ulcers in the study subjects

The most commonest type of leg ulcer observed in our study cohort was venous ulcer (37%) (Figure 1 A) followed by vasculitic ulcer (23%) (Figure 1 B), trophic ulcer (18%) (Figure 1C), diabetic ulcer (9%) (Figure 1 D), pyoderma gangrenosum (7%) (Figure 1 E) and leg

ulcer due to other causes were 6 (6%) which includes cutis marmorata congenital telangiectatica (CMCT) (Figure 1 F), squamous cell carcinoma (SCC) (Figure 1G), Myelo-dysplastic syndrome (MDS), cellulitis and filarial ulcers (Figure 1H) (Table 2). Predominance of venous ulcers was noticed in females (25%) than in males (12%). Whereas vasculitic ulcers, trophic ulcers, diabetic ulcers were frequently found in males accounting for 16%, 11%, and 8% respectively. In this study we have also observed malignancy associated leg ulcers, which includes a case of Squamous cell carcinoma (SCC) and myelodysplasia in a male and female patient respectively. Doppler study revealed that the 31% of the patients diagnosed with venous ulcers developed perforator incompetence (Table 3).



Figure 1 (A-H): The various types of chronic leg ulcers observed in the patients.

Microbial screening of chronic leg ulcers

Staphylococcus aureus was isolated in 27% of the patient's lesions followed by *Klebsiella spp.* 12%, Coagulase negative *Staphylococci spp.* (CONS) 10%, MRSA 9%. *Citrobacter spp.*, *Acinetobacter spp.* and *Proteus spp.* accounted 6% each. Anaerobes and *Pseudomonas spp.* was isolated in 4% and 2% patients respectively. However, culture remained sterile in 18% of the patients (Table 4).

Table 1: Demographic details of the study subjects, (n=100).

Demographic features	Cases
Average age of the study participants (years)	42.01±14.30
No. of males	58
No of females	42
Male:female ratio	1.4:1
No. of patients with age <40 years	45
No. of patients with age >40 years	55
Average disease duration (months)	17.79±29.87
Average disease duration in males (months)	21.32±35.9
Average disease duration in females (months)	12.9±16.48
Median disease duration (months)	9
No of patients with disease duration less than 1 year	55
No of patients with disease duration of 1 to 5 years	33
No of patients with disease duration more than 5 years	12
No. of Patients with single leg ulcer	57
No. of patients with two leg ulcers	23
No. of patients with three leg ulcers	3
No. of patients with multiple leg ulcers	17
No. of patients with ulcers in right leg	40
No. of patients with ulcers in left leg	39
No. of patients with ulcers in both the legs	21

Table 2: Types of chronic leg ulcers observed in the study subjects.

Types of leg ulcer	No. of males	No. of females	Total
Venous ulcer	12	25	37
Vasculitic ulcer	16	7	23
Trophic ulcer	11	7	18
Diabetic ulcer	8	1	9
Pyoderma gangrenosum	3	4	7
Filarial ulcer	2	0	2
Ulcers associated with malignancy	1	0	1
Cellulitic ulcer	0	1	1
MDS	0	1	1
CMCT	1	0	1

Table 3: Microbial culture from the leg ulcers.

Major pathogens isolated from the leg ulcers	No. of cases
<i>S. aureus</i>	27
<i>Klebsiella spp.</i>	1
CONS	10
MRSA	9
<i>Citrobacter spp.</i>	6
<i>Acinetobacter spp.</i>	6
<i>Proteus spp.</i>	6
Anaerobes	4
<i>Pseudomonas spp.</i>	2
No growth	18

Table 4: List of disease conditions associated with the development of leg ulcers.

Disease conditions	Number of patients with leg ulcers
Varicose vein	25
Leprosy	19
Diabetes mellitus	15
Polyarteritis nodosa	8
Rheumatoid arthritis	6
SLE	5
Scleroderma	1
DLE	1

Chronic leg ulcers as a complication in other disease conditions

In our study, we observed that the chronic leg ulcer was a complication of other diseases. 25% of patients with varicose vein, 19% of leprosy patients and 15% of patients with diabetes were observed to have chronic leg ulcers. In addition, leg ulcers were also present in patients with autoimmune diseases like polyarteritis nodosa, systemic lupus erythematosus, scleroderma and discoid lupus erythematosus. Also, a patient with filariasis had chronic leg ulcer.

DISCUSSION

This study is a preliminary attempt to unravel the prevalence and clinical epidemiological features of chronic leg ulcers in a tertiary care hospital. A common finding in our study was the higher incidence of chronic leg ulcers as a primary disease or as sequel to other complications in people above 50 years of age. This high incidence in elderly age group is attributed to increased aged population and prevalence of high-risk factors like obesity, atherosclerosis, diabetes, smoking among such groups. In most of the studies the age of onset of the disease was between 50-60 years. Cornwill et al in their study had 70% of the patients over the age of 70 years.⁴ The male to female ratio observed in our study was 1.4:1. In our study, we observed a propensity towards higher

incidence of chronic leg ulcers in males which is in line with the reports of Hanson⁵ Our findings did not concur with the reports by Callam et al as their reported incidence of leg ulcers in females was higher than in males (2.5:1).⁶

The gender difference in the incidence of leg ulcers in our study cohort can be attributed to the occupation of the diseased. Most of the male patients were employees who require a long time standing which is a major precipitating factor for the occurrence of venous ulcers. In this study, chronic ulcer with vascular etiology accounted for only 60 % of all the cases. Stasis ulcers accounted for 37% and vasculitic ulcers accounted for 23%. Chronic ulcers associated with diabetes were observed in 9% of our patient group. Trophic ulcers were observed in 18% of our cohort. Miyashiro et al reported that ulcers in leprosy patients are rare and ulcers in them were mainly due to reactional states such as Lucio's phenomenon or secondary to neuropathies.⁷ In our study, patients with neuropathy were observed to have trophic ulcers in the leg as a sequel to neuropathies of leprosy.

Doppler is a helpful tool to assess venous incompetence.⁸ In our study, we observed a higher incidence of perforator incompetence and long saphenous vein incompetence. Some patients exhibited both. Hence, Doppler, has been recommended in patients with venous ulcers to monitor the progress of the disease and to impart necessary therapeutic management.^{9,10}

Pyoderma gangrenosum (PG) accounts for 7% of leg ulcers in our study group. PG in 50% of the case develop without an underlying cause.¹¹ It was recommended by Koo et al that in patients with purulent ulcers, Crater-like holes or cribriform scarring in the legs should be considered for PG to be the underlying cause of chronic leg ulcer.¹² PG may also occur as a sequel to IBD, psoriasis and ankylosing spondylosis. In addition, PG will also be seen during malignancies such as chronic myeloid leukemia and hairy cell leukemia etc. The role of cytokine in pathergy has led to the use of biologicals targeting the inflammatory mediators to treat PG.^{13,14}

Development of leg ulcers in autoimmune diseases has been attributed as a sequel to the underlying vasculitis of the small and/or medium sized blood vessels of the skin.¹⁵ Leg ulcers is a common finding in patients with underlying autoimmune diseases such as rheumatoid arthritis, Felty syndrome and systemic autoimmune vasculitis. In our study we observed that leg ulcers due to autoimmune diseases was 21%, of which ulcers due to rheumatoid arthritis was 6%. We screened for the presence of antinuclear antibody and Rheumatoid factor to confirm the respective underlying disease. Our findings are similar to the reports of Shanmugam et al.¹⁶

Baldursson et al reported that the squamous cell carcinoma in chronic venous leg ulcers is very fatal with shortened survival. The prognosis is poor with poorly

differentiated tumor.¹⁷ Schupke et al had attributed the chronicity of leg ulcer as the reason for the development of SCC. In our study the patient who developed SCC had leg ulcer for 7 years. They have also suggested that a chronic non healing ulcer for a period of six months should be subjected to biopsy to screen for the presence of SCC.¹⁸ In our study we observed a patient with filariasis had non healing leg ulcer due to lymphatic obstruction and it is co morbid complication of lymphatic filariasis. Our observation with regard to ulcers in filariasis are in agreement with the reports of Burri et al. They reported the occurrence of chronic non-healing ulcers in filariasis patients with advanced stages of lymphedema.¹⁹

In our study we observed that around 82% of the patients had microbial colonization in the lesions. *Staphylococcus aureus* was the most common isolate from ulcers (27%). We observed methicillin resistant *Staphylococcus aureus* (MRSA) in 9% of patients which is slightly higher than the reports from Jockenhöfer et al (8%). Our findings are similar to the reports of Rit et al who carried out a study to isolate the bacteria infecting chronic leg ulcers and reported the incidence of bacterial spectrum as found in our study.²⁰

The differences in the incidence of MRSA can be attributed to the sample size and the inclusion of MRSA specific antimicrobial agents in the drug formulations. The major limitation in our study is our sample size, despite the limitation we observed a higher incidence of MRSA, which emphasizes the bacterial culture of chronic ulcers to eliminate one of the causes for ulcer chronicity, i.e., the bacterial pathogens like MRSA etc. Jockenhöfer et al, related the presence of *Pseudomonas aeruginosa* isolation with the cleansing of wound with tap water.²¹ Therefore findings also suggest that bacterial culture from the wounds will be helpful in directing us towards better treatment and management of chronic leg ulcers.

CONCLUSION

Chronic leg ulcers are very common in elderly patients and venous ulcer being the commonest type observed in our cohort. Doppler is an effective tool for the assessment and management of the disease. Diagnosis of underlying causes such as pyoderma gangrenosum, autoimmune diseases complications like malignancies are necessary for the treatment and management of chronic leg ulcers. Bacterial culture from the wound will be helpful to identify the microbial cause for the chronicity and for treatment and management of the disease. A multicenter study encompassing larger sample size will be helpful to establish relevant data for chronic leg ulcers.

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