



CLINICO-ETIOLOGICAL EVALUATION OF CHRONIC LEG ULCER IN DEPARTMENT OF DERMATOLOGY, PATNA MEDICAL COLLEGE AND HOSPITAL, PATNA, BIHAR.

Dermatology

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ABSTRACT

Background: A chronic leg ulcer (CLU) is a significant public health problem. It has various etiologies. Racial, familial, occupational, and social factors may also have an impact on the prevalence of different causes of leg ulcers. Though there are western data on the epidemiology of leg ulcer, similar data are largely unavailable from our part of the world.

Aims: We undertook a study in PMCH, Patna, Bihar, a tertiary care center to determine the clinical and etiological pattern of patients with CLU.

Materials And Methods: Hundred consecutive patients presenting with CLU, fulfilling the criteria, were included after informed consent. Patients were subjected to proper history taking, clinical examination, routine blood test, and pus for culture and sensitivity test (where needed) along with Ankle Brachial Index (ABI).

Results: Among the 100 patients, venous ulcer (34%) was predominant followed by arterial ulcer (14%), mixed arterial and venous ulcer (11%). History of smoking (56%) and obesity (BMI >25) (32%) were the common risk factors in leg ulcer patients. Fifty nine percent of the total CLU were infected and out of this, 86.4% showed growth of microorganisms. Staphylococcus aureus (39%) was the most commonly isolated organism, followed by Pseudomonas aeruginosa (15%). Eleven (24.44%) clinically diagnosed venous ulcer patients showed significantly lower ABI (<0.9) and were diagnosed as mixed ulcer (a venous ulcer with a peripheral arterial disease).

Conclusion: Venous ulcer and mixed ulcer are the most common type of CLU.

KEYWORDS

Ankle brachial index, chronic leg ulcer, peripheral arterial disease, venous insufficiency

INTRODUCTION

Chronic leg ulcers are the ulcers over the lower leg of more than 6 weeks duration. It represents a significant public health problem for both the patient and the health service provider. Leg ulcers have multiple etiologies (such as venous ulcer, ischemic or arterial ulcer, trophic ulcer) and many comorbid associations (obesity, smoking, prolonged standing). Thorough history taking, clinical examination, routine and specific investigations are important for proper diagnosis and management.

Most of the available studies discuss the problem of leg ulcer in developed countries, which is different from our set up. The commonest cause of leg ulcer in a developed country is a venous ulcer. A trophic ulcer makes up a small number and among this group, diabetic ulcer is most common. In our country, the prevalence of leprosy and the consequence of it as trophic ulcer are high.

It was shown in various studies that racial, familial, occupational, and social factors may have an impact on the prevalence of different causes of leg ulcers. Though there are western data on the epidemiology of leg ulcer, similar data are largely lacking from our part of the world. So, demographic study and etiological evaluation are needed in our set up.

A complete evaluation of leg ulcer including a detailed history, thorough examination, relevant tests which include pus or swab for culture and sensitivity, artery and venous Doppler study, Ankle Brachial Index (ABI) are important for accurate diagnosis and proper management of the condition.

However, these are seldom done resulting in inappropriate use of antibiotics and failure to diagnose associated peripheral vascular disease in many patients.

Relative lack of formal studies to evaluate the clinico-etiological features of leg ulcer with special emphasis on the above-discussed topics prompted us to undertake the present study.

MATERIAL AND METHODS

This was a hospital-based cross-sectional study, where patients of all age groups and both sexes, presenting with CLU at dermatology OPD in Patna Medical College and Hospital, Patna, Bihar a tertiary care hospital between July 2019 and June 2020, were included.

Hundred consecutive patients of CLU with more than 6 weeks duration, who were willing to participate in the study after signing the informed consent, were evaluated.

All patients underwent a detailed history, complete demographic profile, thorough clinical examination, routine blood examinations, pus for culture and sensitivity test where applicable, Ankle Brachial Index (ABI), and color Doppler study of both the arterial and venous system of lower limbs. The criteria adopted to diagnose the different types of ulcers were chiefly clinical with special reference to the location, morphology, and presence or absence of pain, edema, or pigmentation aided by other cutaneous and systemic examinations and tests mentioned above.

RESULTS

Most of the patients belonged to the ages between 19 and 60 years (75%) with a range of 7 to 82 years [Figure 1].

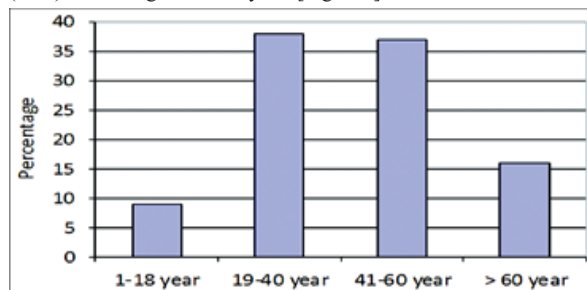


Figure 1: Age distribution

Out of the 100 patients, 82 were male (82%), with male to female ratio of 4.56:1. There were 56 patients (56%) of rural habitat.

Occupation-wise 24% were laborer, 17% shopkeeper, 14% housewife, 10% barber. Shopkeepers (37.78%) and barbers (22.22%), with a history of prolonged standing in the range of 10–12 h per day, constituted the commonest venous ulcer and mixed ulcer patients. Out of a total 45 venous and mixed ulcer patients, 29 (64.44%) had a history of prolonged standing [Figure 2].

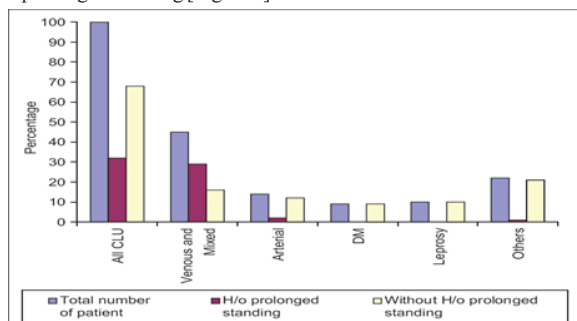
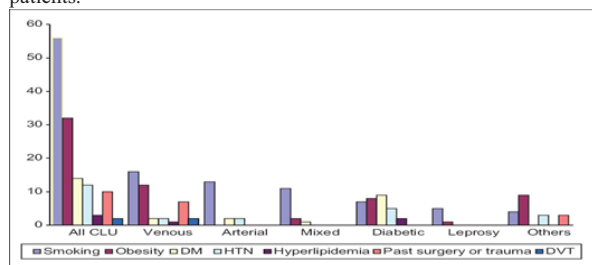


Figure 2: Type of ulcer with relation to prolonged standing. CLU- Chronic leg ulcer; DM-Diabetes mellitus

Among the etiological distribution of patients there was a predominance of venous ulcer (34%) followed by arterial ulcer (14%), mixed arterial and venous ulcer (11%) and ulcers due to leprosy (10%), and diabetes mellitus (DM) (9%).

Venous ulcers were diagnosed clinically by the presence of shallow ulcers with irregular margin in association with either varicosity, lipodermatosclerosis, or obesity in varying combinations predominantly located around the ankles. The arterial ulcers were almost always painful and punched out located usually over the dorsa of the toes and distal part of the legs. The lower limbs in persons suffering from arterial ulcers were usually shiny. The trophic ulcers were asymptomatic, bigger and located predominantly over the planter aspect of the balls of the great toes and sometimes underneath the little toes.

History of smoking (56%), obesity (BMI >25) (32%), diabetes mellitus (14%), hypertension (HTN) (12%), and history of trauma or surgery (10%) were the common risk factors associated in CLU patients [Figure 3]. Obesity was found in 12 (35.29%) venous ulcer patients. History of smoking was found in 13 (92.85%) patients with arterial ulcer and in all the 11 (100%) patients with a mixed ulcer. Deep vein thrombosis (DVT) was found in 5.9% of our venous ulcer patients.



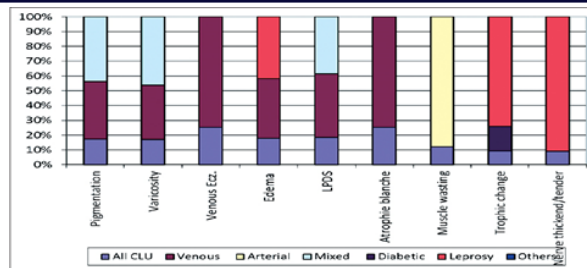
CLU-Chronic leg ulcer; DM-Diabetes mellitus; HTN-Hypertension; DVT-Deep vein thrombosis

Figure 3: Risk factors associated with leg ulcer

Out of the total 100 patients, 76% patients had unilateral ulcer (35 right-sided and 41 left-sided). There was no preference in right or left side in chronic leg ulcer.

Pigmentation and varicosity were the most common associations with mixed ulcers (76% and 75% respectively) and pure venous ulcer patients (67% and 60% respectively). Lipodermatosclerosis (LPDS) was found in 56% of venous ulcer and 50% cases of mixed ulcer patients. Clinically, venous ulcers were associated with edema (48%), varicose veins (60%), eczema (37%), and atrophic blanche (22%) [Figure 4].

Most of the ulcers were of 6 to 24 weeks duration. Majority of the ulcers were below 4 cm² and between 5 and 9 cm².



LPDS-Lipodermatosclerosis; CLU-Chronic leg ulcer

Figure 4: Distribution Of Clinical Features In Chronic Leg Ulcer.

The common sites of ulcer from all causes were medial malleolus (28%), lateral malleolus (17%), digital (16%), and planter aspect (16%). Medial (61%) and lateral malleoli (16%) were the common sites in a venous ulcer. The commonest site of arterial ulcer and leprosy ulcer were digital (75%) and planter (89%) respectively.

Out of 100 patients, 59 (59%) patients showed signs of infection and out of these, 8 patients had no growth on culture while 51 (86.4%) had growth of microorganism. *Staphylococcus aureus* (39%) and *Pseudomonas aeruginosa* (15%) were the common organisms isolated in leg ulcer. Other species like *Escherichia coli*, *Proteus*, *Klebsiella* were also grown. *Stenotrophomonas maltophilia*, a rare organism, was isolated in a case of infected leg ulcer.

According to the antibiotic sensitivity, *Staphylococcus aureus* was found to be more sensitive to cefuroxime (87%) and amoxicillin-clavulanate (77%) and was least sensitive to azithromycin (40%). Hundred percent of the isolates of *Pseudomonas aeruginosa* were sensitive to amikacin. Overall antibiotic sensitivity report in chronic leg ulcer was in favor of amikacin (86%), levofloxacin (69%), azithromycin (58%), and amoxicillin-clavulanate (58%).

Out of the 100 patients, 59 patients with clinically diagnosed venous ulcer (45) and arterial ulcer (14) underwent color Doppler test. Leg perforator incompetence was the most common abnormality found in clinically diagnosed venous ulcer patients. All the arterial ulcer patients showed arterial Doppler abnormality like narrowing of arterial lumen in different stages. There were 34 patients with venous ulcers and 14 with arterial ulcers alone based on clinical diagnosis and color Doppler abnormality. Eleven (24.44%) additional patients clinically diagnosed as having venous ulcers showed significantly lower ABI (<0.9) and were subsequently confirmed as having mixed ulcer (venous ulcer with peripheral arterial disease). All the arterial ulcer patients had ABI of <0.9.

DISCUSSION

Leg ulcers represent a break of the skin, sometimes extending through the dermis or deeper structures over the lower leg. A chronic leg ulcer (CLU) is defined as one lasting for 6 weeks or more. It is a common condition and usually associated with significant morbidity, reduced quality of life and high cost of healthcare.

In the present study the age of the patients ranged from 7 years to 82 years and the common age of presentation was 19–60 years (75%). This is different from the previous studies which show the rising incidence with increasing age. Most of our patients were less than 60 year of age and had comparatively lesser comorbidities. In another study, there were two peak periods of age at presentation, 30–39 and 50–69 years, respectively.

A chronic leg ulcer is reported to be more common in female or male and female in an equal distribution. In the current study due to the occupation and the socioeconomic background of the attending patients, there was a male predominance with male to female ratio of 4.56:1; that was different from the previous studies, but was almost similar to a study which showed 59% of male predominance.

In the present study, 56% patients were of rural habitat. There are no data in India regarding the rural and urban population difference in CLU. One study from south India on diabetic leg ulcer showed higher incidence among rural population with amputation rate being also higher among rural patients.

In our study, venous ulcer was the commonest type (34%) of CLU,

followed by arterial (14%), and mixed arterial and venous ulcers (11%). CLUs due to leprosy (10%), diabetes mellitus (9%), primary infective (8%) and traumatic (6%) followed in decreasing order. It is similar to the reported studies. Poorly managed trauma followed by infection was the common cause in a study from Nigeria. Our patients rarely gave history of walking bare footed outdoors, thus reducing the chances of direct trauma and consequent infection.

Shopkeepers (37.78%) and barbers (22.22%), with a history of prolonged standing, were the commonest profession with venous ulcer and mixed ulcer. Prolonged standing may be a risk factor in venous ulceration, but there are no published data confirming this.

Obesity was found in 35.29% of venous ulcer patients in this study, which was significantly less than that seen in a previous study where it was an important comorbidity (74.1%). All the arterial ulcer patients were non-obese. History of smoking was found in 92.85% of patients with arterial ulcer and 100% of patients with mixed ulcer.

Majority of the patients did not have associated medical condition. Diabetes mellitus (14%), hypertension (12%), and history of trauma or surgery (10%) were the common associations. A study on leg ulcer found diabetes mellitus and hypertension in 16% and 13% cases, respectively, similar to the present study. Previous DVT was found in 5.9% of our venous ulcer patients contrary to 13% of patients in another study probably because the predisposing factors for DVT were less in the present study. All the arterial ulcer patients in the present study had a normal serum lipid profile level.

Clinically venous ulcers were associated with LPDS (56%), lower limb hyperpigmentation (67%), edema (48%), varicose vein (60%), gravitational eczema (37%), and atrophie blanche (22%). In contrast, LPDS was seen in 96%, pigmentation in 95%, edema in 94%, varicose vein in 88%, and eczema in 51% of venous ulcer patients in a previous study.

In most of our cases, ulcer was of 6–24 weeks duration and most of these were <9 cm² in size.

Medial malleolus (61%) and lateral malleolus (16%) were the common sites in venous ulcer. The commonest site of arterial ulcer and leprosy ulcer were digital (75%) and planter (89%), respectively. The medial malleolus region was the most frequently affected area (45.6%) in a previous study.

Out of the 100 patients, 59% patients showed signs of infection and out of these infected patients, 51 (86.4%) had growth of microorganism. *Staphylococcus aureus* (39%) was the most commonly isolated organism in leg ulcer similar to a study where *Staphylococcus aureus* had been reported in 43% of infected leg ulcer. *Pseudomonas aeruginosa* was found in 15% of ulcers in contrast to 7%–33% of ulcers in a study. Other bacteria like *Escherichia coli*, *Proteus* species, and *Klebsiella* species were also found in this study similar to the previous studies. Authors earlier reported the first case of leg ulcer infected with *Stenotrophomonas maltophilia*, a rare bacterium, from this part of the world.

According to the antibiotic sensitivity, *Staphylococcus aureus* was found to be most sensitive to cefuroxime (87%) and amoxicillin-clavulanate (77%), whereas azithromycin (40%) was least sensitive. *Pseudomonas aeruginosa* was in 100% cases sensitive to amikacin. Overall antibiotic sensitivity in chronic leg ulcer was in favor of amikacin (86%), levofloxacin (69%), azithromycin (58%), and amoxicillin-clavulanate (58%). In contrast, previous studies showed the isolates were sensitive to third-generation cephalosporins and fluoroquinolones and these drugs were used as first-line antimicrobial agents by them, unless contra-indicated.

Prevalence of leg ulcer is much more in developing countries because of little or no foot care knowledge, especially in rural areas, and delay in availing health care facility. There are no clear cut guidelines for leg ulcer management in our country. An indiscriminate use of systemic antibiotics causes drug resistance, and when applied topically, allergic reactions at the site of the ulcer. So culture and sensitivity test of isolated microorganism from ulcer is required for better CLU management.

found in clinically diagnosed venous ulcer patients on color Doppler study. This finding is more or less similar to previous studies where more than 85% of patients with chronic venous insufficiency have problem in superficial veins and perforator incompetence and up to 90% of these patients usually benefited with the surgical treatment alone.

All the arterial ulcer patients had ABI of < 0.9 and showed arterial Doppler abnormality like narrowing of arterial lumen in different stages. Among 45 clinically diagnosed venous ulcer patients 34 had venous insufficiency based on color Doppler study. Additional 11 (24.44%) clinically diagnosed patients of venous ulcer showed significantly lower ABI (<0.9) and were subsequently grouped as mixed ulcers (a venous ulcer with a peripheral arterial disease). This finding is more or less similar to previous studies.

CONCLUSION

We conclude that in contrast to the western study, young males with a history of prolonged standing suffered from chronic leg ulcer more frequently in our study. Venous ulcer and mixed ulcer are the most common type of CLU. Proper counseling to minimize the risk factors might go a long way in reducing the burden of CLU.

ABI assessment in addition to color Doppler study would help detect associated peripheral arterial disease in the presence of venous insufficiency. Inappropriate antibiotic trial should be avoided and proper culture sensitivity test should be done periodically to avoid emergence of drug resistance and also contact sensitization.

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Leg perforator incompetence was the most common abnormality