Leg ulcers in a tertiary public hospital in a sub-Saharan African country (Togo)

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Abstract

Purpose: Data about the epidemiological and clinical characteristics of leg ulcers in our country are still insufficiently documented.

Material and methods: Charts of patients hospitalised for leg ulcers in the Department of General Surgery between 1 January 2009 and 31 December 2014 were retrospectively assessed for sociodemographic, clinical, therapeutic, and outcome characteristics.

Results: In total, 582 charts reported leg ulcers thus representing 33% of all charts in the Department of Surgery during the study period. Among them, 144 charts contained enough information to be included in the study. The population of patients with leg ulcers was approximately balanced with respect to gender (1.15 men to women ratio). Median age was 53.07± 17.9 years old (yo), (range 18–90). Diabetes (27.8%), hypertension (11.8%) and alcohol consumption (8%) were the most prevalent of the reported medical history. Leg ulcers presented as infectious ulcers (necrotising fasciitis, superinfected traumatic wounds) in 48 (33.3 %) patients, vascular ulcers (arterial, venous or mixed) in 25 (17.4 %) patients, and diabetic foot ulcers in 71 (49.3 %) patients, according to the major etiology factor accounted. Ten amputations (7%) at the level of leg or thigh were performed, all in diabetic patients. The median length of hospitalisation was 37.55 ± 51.45 days (range 1–380 days). Ninety-eight patients (68.1%) achieved complete healing, while 38 patients (26.4%) died.

Conclusion: Leg ulcers occur in Togo as in other African countries at a young age, mostly caused by infections and complications of diabetes, with a high rate of amputations and mortality.

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Introduction

As complications of vascular disease, infections or diabetes, leg ulcers are generally located at the dependent part of the lower extremities. In the developed countries, the incidence is estimated at 1 to 1.3% and the predominant process is vascular (venous or arterial). The risk rises with age, and peaks at around 70 yo.[1-8] In tropical Africa, the vascular process is not the leading cause for leg ulcers, and the age of occurrence is also younger.[9-14] Leg ulcers are a worldwide public health problem because of their repercussion on the quality of life and productivity of patients. In addition, the cost of treatment is high.[15] Epidemiological and clinical aspects of leg ulcers have been published from many African countries. [9-14,16,17] Data about this condition and its related comorbidities are still insufficiently documented in Togo. A study conducted by the Ministry of Health about non-transmissible diseases in 2010 showed that prevalence of diabetes in the population aged between 15 and 64 years of age was 2.6%.[18] Complications of diabetes were not reported. Likewise, leg ulcers were omitted in this study.

This is a descriptive retrospective study on the epidemiological, clinical and therapeutic characteristics of leg ulcers in an inpatient hospital setting compared to the literature of other African and Western Countries.

Patients and Method

Togo is a Western Sub-Saharan African country on the Atlantic coast. With a land surface of 56 600 km^2, the population was estimated at 5 337 000 inhabitants in 2009,[18] with close to 2 million inhabitants in the capital of Togo, Lome. Sylvanus Olympio, is one of the two tertiary hospitals in the capital, and the only one with a department of general surgery at the time of this study. Two rooms in this department had a capacity of 16 beds and were used for inpatients' care for chronic wounds. Data recorded in paper charts of patients hospitalised in the department of general surgery in the Sylvanus Olympio Teaching Hospital for leg ulcers from 1 January 2009 to 31 December 2014 were retrospectively assessed. Approval from our Department Review Board was obtained for this study. Demographic (age, gender), clinical (symptoms, general and physical examination findings), morphologic test (Doppler ultrasonography), bacteriological tests, therapy, and outcome characteristics of patients with leg ulcers were documented. Charts of patients hospitalised for leg ulcers

that contained relevant information were included in this study. Incomplete charts and missing charts were criteria of exclusion.

In this study, leg ulcers were divided into three etiological groups according to the major etiology factor. Clinical examination was the main tool used for diagnosis. Vascular ulcers were assessed by clinical examination (clinical signs of venous insufficiency, palpation of pulses, local temperature, localisation of ulcers and clinical presentation of wounds). Doppler echography was performed for some patients. No patient had measure of ABPI. Etiologies of leg ulcers were as follows according to the main presentation of the disease:

- Vascular ulcers were venous, arterial or mixed in origin, in non-diabetic patients;
- Infectious ulcers stand for superficial skin infection in non-diabetic patients, necrostizing fasciitis, and superinfected traumatic wounds;
- Diabetic foot ulcers were ulceration, superficial infection, deep infection, wet gangrene and peripheral occlusive arterial disease leading to distal dry gangrene in diabetic patients.

Treatments were classified into:

- Medical treatment: insulin therapy, antibiotic therapy, pain relievers, anticoagulators, and other medications according to the etiology of the leg ulcers;
- Wound dressing: using conventional dressing (gauzes, bandage), or modern dressings;
- Surgical treatment: surgical debridement, autologous skin grafts (split thickness skin graft or pinch graft), and amputations.

Four outcomes were considered:

- Healing: patients for whom the chart mentioned that the ulcers were totally healed;
- Relapse: leg ulcer occurring at the same site that had previously healed;
- Recurrence: new leg ulcer in any other site;
- Death: patients died during hospitalisation; patients who died after discharge were not recorded in the patient s' charts and therefore were not included in the mortality count.

Data were collected on an investigation sheet and processed with Epi Info (CDC Atlanta 2003).

The results were as general descriptive statistics, presented as medians with standard deviations, and ranges.

Results

The study period was 6 years. One thousand seven hundred and sixty-three (1763) patients were hospitalised during that time in the general surgery department. Among them, 582 (33%) were

Table 1: Clinical signs and leg ulcer etiologies

		Number of patients (n)	Percentage (%)
Symptoms	Pain	109	75.7
	Loss of sensation	36	25
	LES*	18	12.5
	Intermittent claudication	03	2
General signs	Fever	86	59.7
	Weight loss	33	22.9
	Skin and mucous pallor	40	27.8
	Fatigue	48	33.3
	HTN**	17	11.8
Physical signs	Varicose veins	07	04.8
	Dermatofibrosclerosis	01	0.7
	Hypoesthesia	67	46.5
	Suppurations	72	50
	Inguinal lymph nodes	58	40.3
	Warm in the leg	67	46.5
	Diminished pulse	05	03.8
	Tissue necrosis	93	64.6
	Devascularised and blackened leg (gangrene)	02	01.4
Laterality	Right	66	46
	Left	58	40
	Bilateral	10	7
	Not specified	10	7
Anatomical site	Leg	62	43
	Foot	72	50
	Foot and leg	10	7
Etiologies of Leg ulcers	Infections	79	54.8
	Vascular disease	25	17.4
	Diabetic foot	40	27.8

*LES: Lower extremity swelling ** (HTN) hypertension

hospitalised for leg ulcers, thus an admission rate of 97 patients for leg ulcers per year. Of those, 438 (75%) patients had missing or incomplete charts and were not included in this study. The study population included 144 patients whose charts had relevant complete information.

In the study population, median age was 53.07± 17.9 years old (range 18–90 years). The age group of 31–70 was the most represented (Figure 1). The population was approximately balanced with respect to gender (53.5% male, 46.5% female).

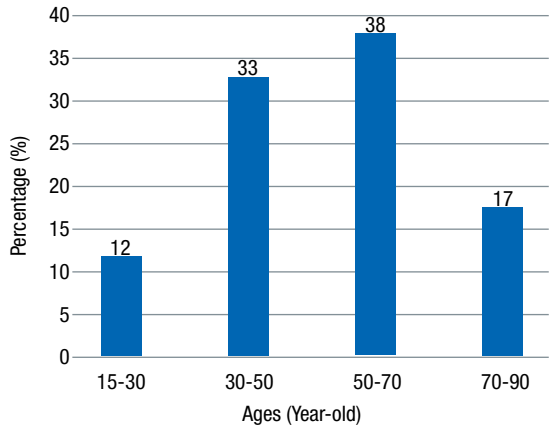
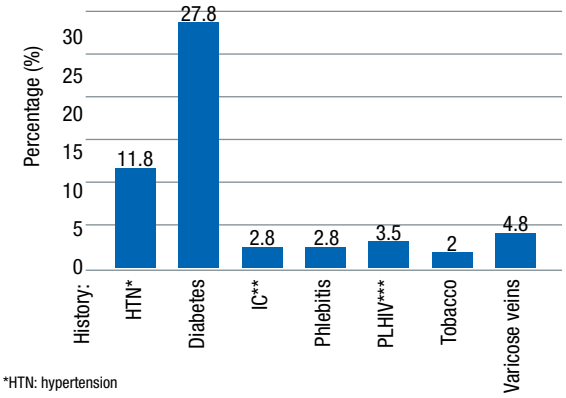


Figure 1: Patients distribution in age groups



*HTN: hypertension
**IC: intermittent Claudication
***PLHIV: Person living with Human Imunodeficience Virus

Figure 2: Patients Anamnesis
The total of percentages is expressed over the general population thus represent 55% of patients presenting a medical and social history

Pre-existing medical conditions (Figure 2) were found in 79 (55.5%) patients, and consisted mostly of diabetes (27.8%) and hypertension (11.8%), while 65 patients (44.52%) reported no pre-existing medical or social conditions. Among patients reporting no pre-existing medical condition, 31 patients had a diagnosis of diabetes at admission time.

Symptoms most reported were pain (75.7%) and loss of sensation (25%). Fever (59.78%), and fatigue (33.3%), weight loss (22.9%), skin and mucous pallor (27.8%) were the prevalent general signs. Physical examination mostly found signs of infection: tissue necrosis (64.6%), suppurations (50%), inguinal lymph node (40.3%), and leg skin warmth (46.5%). Symptoms, clinical examination, and etiologies of leg ulcers are depicted in Table 1.

In the symptoms and signs sections, as some patients presented multiples signs in the same section, we could not have a total of 100% percentage at final.

Doppler echography of arteries and veins of the lower limbs was performed for ten patients and revealed three patients presenting arterial partial obliteration, and two patients with deep venous thrombosis and varicose. Five patients presented mixed signs of arterial and venous diseases. In two patients, Doppler echography was normal.

Bacteriological tests were performed on wound biopsies, cotton swab, or pus samples for 18 patients (Table 2). Mostly reported germs were P aeruginosa (six cases), S Aureus (five cases), and E coli (five cases), all multidrug resistant.

Table 2: Isolated germs

	Frequencies (n)
Pseudomonas aeruginosa	6
Staphylococcus aureus	5
Escherichia coli	5
Acinetobacter Bomani	1
Enterobacter	2
Proteus Mirabilis	1
No germ found	3
Total	**23**

Some patients presented more than one germ thus making the total more than 18.

Regarding etiology, 48 (33.3 %) presented infectious ulcers (necrotising fasciitis, superinfected traumatic wounds), 25 (17.4 %) vascular ulcers (arterial, venous or mixed), and 71 (49.3 %) diabetic foot ulcers.

Clinical presentations of diabetic foot ulcers are reported in Table 3.

Table 3: Clinical presentation of diabetic feet

	Frequency (n)	Percentage (%)
Ulceration	4	5.6
Superficial infection	26	36.6
Deep infection	31	43.7
POAD* with distal dry gangrene	2	2.8
Wet gangrene	8	11.3
Total	**71**	**100**

*Peripheral occlusive arterial disease
Percentage of cases were reported to the 71 diabetic patients.

All patients (100%) received medical treatment according to the etiology of the leg ulcer. Wound dressings were done in 142 patients (99%). Two patients did not have wound dressings; they died on the first day of admission. Wound dressing was done with antiseptics and soaked gauze, Vaseline tulles, in all patients except six diabetic patients for whom the dressing was done with hydrocolloids. Local and parenteral antibiotics were used in all clinically infected wounds. No patient presenting a diabetic foot had immobilisation in the pattern of total contact cast, for example.

All patients with venous leg ulcers had compression therapy with commercial socked compression garments.

Surgical debridement was done in 32 patients (22%). Amputations were performed on 10 patients (7%) at the level of leg or thigh, all in diabetic patients. Autologous split thickness skin grafts were performed on eight patients (6%). Details of surgical treatments according to the etiology are reported in the Table 4.

Table 4: Surgical wound management according to the etiology of leg ulcer

	Surgical debridement	Skin graft	Directed wound healing with dressings	Amputation
Vascular ulcers	0	0	25	0
Infectious ulcers	22	6	40	0
Diabetic foot	10	2	61	10
Total	**32**	**8**	**126**	**10**

The median length of hospitalisation was 37.55 ± 51.45 days (range 1–380 days) (Figure 3).

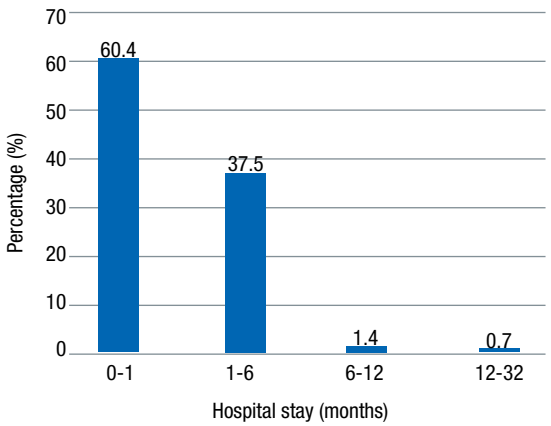


Figure 3: Duration of hospital stay

Complete healing was reported in 98 patients (68.1%) while 38 patients (26.4%) died. Sudden death occurred in 10 patients caused by pulmonary thromboembolism suspected clinically. All other 28 patients died of infection presented as sepsis. There was no case of relapse or recurrence reported in the files. The patients' files did not report the surgical treatment of venous chronic insufficiency and arterial occlusion in the department of vascular surgery.

Discussion

In this study, we surveyed medical charts of patients hospitalised with leg ulcers over a period of 6 years, to characterise them with respect to demography, etiology and other factors. We found that, as compared to patients in developed countries, leg ulcer patients in our study were diagnosed at a younger age, with etiologies mostly of infections and diabetic complications, and a high rate of amputations and mortality.

The main bias of this study is the great number of charts that were unusable. In our setting, chronic wounds such us leg ulcers had no dedicated doctors. Those patients had had nurse care until surgical procedures such as skin grafts or amputations became necessary. Nurses in our setting were not trained to complete the paper based medical charts. On the other hand, this study only reported patients treated in hospitalisation and totally ignored outpatients thus not giving the real incidence of the disease. The young age of this population found in our study (45% were patients under 50 years old and 38% were between 50 and 70) has been reported in many other African publications. [9-14,16,17] In western studies, the mean age appears to be higher than that reported in Africa, at around 70 years with a female predominance.[1-8] This could be a reflection of the African low life expectancy compared to Western countries. Moreover, some infectious and genetic burdens (parasites, sickle cell disease, yeast and bacterial infections) that could be leg ulcer risk factors are at present mostly found in African settings. [9,19] In this study, diabetes was the most important risk factor found in the medical history of patients as was in almost all African publications. Mbunda et al. found risk factors of tobacco use and diabetes in 22.7 and 10.6% of cases, respectively.[11] Sibanda et al. in Zimbabwe reported 30% of diabetes patients, the second risk factor after HIV.[13] Niang et al., in Senegal, reported obesity in 16%, sickle cell disease in 12% and tobacco use in 8% of patients with leg ulcers.[9] Diabetes is an important risk factor in populations of leg ulcer patients in Western countries as well.[20,21] However, in Africa, high levels of illiteracy and ignorance, on top of lack of specialists, are responsible for high rates of severe complications such as infections that lead to dry or wet gangrene more than in Western countries. In Togo, it has been reported that 92% of population had never checked their glycaemia before the diagnosis of diabetes.[18] In Nigeria, Ogbera et al. reported that 25% of diabetes patients were diagnosed after occurrence of a leg ulcer. Isiguzo and Jac-Okereke in the same country reported that 60% of the diabetic patients in their setting had no knowledge of foot care.[10,22] Those reports bare some resemblance to our findings in Togo, and may explain why diabetes feet were the first in the list of etiologies followed by infectious etiologies, a profile directly opposite to Western countries, where vascular etiology is by far the leading cause of leg ulcers, accounting for around 80% of cases.[20,23,24] In infected legs, germs isolated seemed to be similar to those found in Western countries and other African countries (multidrug resistant *Pseudomonas aeruginosa, Staphylococcus aureus,* and *Escherichia coli*).[10,11,25,26] This could increase the treatment cost but, in some cases, lead to infection spreading above the site of the ulcer, making amputations the only choice to save the lives of some patients. Amputation rate in our setting was 7%, comparable to that reported by Mbunda et al. (8.5%), and Sibanda et al. (9%).[11,13] The healing rate is related to the high proportion of infectious etiologies. Added to diabetic feet, infected leg ulcers represented the leading cause of high mortality and long hospital stays. Although hypertension is not a cause of leg ulcer per se, we found almost 12% of patients presented this in their medical history. Further studies would be needed to find out if this has an indirect relation with leg ulcers in our setting.

Conclusion

This study indicated that leg ulcers occur in Togo as in other African countries at a young age and are mostly caused by infection and diabetes complications with a high rate of amputation, high rate of mortality (more than a quarter of patients died), and long hospitalisation. The findings of this study may serve as a framework for the design and plan of a wound care center in our hospital, and a wound care network in our country.

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