

Erysipelas of the leg (cellulitis) in sub-Saharan Africa: A multicentric study of 562 cases

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ABSTRACT

Introduction: Erysipelas of the leg is a common and serious infection. We carried out this study aiming at describing the epidemiological and clinical characteristics, and assessing the risks factors associated with the local complications of erysipelas of the leg in sub-Saharan Africa. **Methods:** This was a prospective multicentric study carried out in the dermatology units of Hospitals located in seven sub-Saharan African countries during a period of 12 months. Patients aged 15 and above with a first episode of erysipelas of the leg were recruited. **Results:** In this study, 562 patients were recruited, having a mean age of 43.7 ± 16.9 years and a sex-ratio (M/F) of 0.67. Patients infected on one leg were 562 while those infected with two were 27. Bullous forms of the disease were observed in 95 patients, while purpuric forms were observed in 167 patients. The existence of a point of entry (485 cases), obesity (230), lymph edema (130) and the use of bleaching agents (97) were the mains risk factors. Complications during the course of the infection such as necrotizing fasciitis (34 cases) and abscesses (63 cases) were observed. They were due to the use of antibiotics and non-steroidal anti-inflammatory treatments, and the use of cataplast. **Conclusion:** This study reveals that existence of a point of entry, obesity and lymph edema, and the use of bleaching agents were the mains risk factors influencing the local complications of erysipelas of the leg. Necrotizing fasciitis and abscesses were influenced by the use of antibiotics and non-steroidal anti-inflammatory treatments, and the use of cataplast.

Key words: Erysipelas; Sub-Saharan Africa; Cellulitis

INTRODUCTION

Erysipelas also called bacterial dermo-hypodermatitis is an infection of deep skin layers, mainly due to streptococcus [1,2]. Facial localization became become less frequent while the infection is currently developed

on the leg [3,4]. Erysipelas of the leg is a common skin infection in dermatology consultation in sub-Saharan Africa [5-8]. However monocentric studies are rather conducted in these areas instead of multicentric type studies. We aimed at describing the epidemiological and clinical characteristics of erysipelas of the leg, and

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assessing the main risk factors influencing its local complications in sub-Saharan Africa.

MATERIALS AND METHODS

Type and Population of the Study

This was a multicentric study conducted during a 12 months period (October 2013-september 2014) in seven sub-Saharan African countries: (Togo, Senegal, Mali, Côte d'Ivoire, Guinea Conakry and Burkina Faso, and Cameroon).

Criteria of Inclusion

Patients aged 15 and above, who attended dermatology consultation for a first history of acute erysipelas of the leg, were recruited. The diagnosis of erysipelas was based upon following criteria: sudden onset of red and edematous and inflammatory leg associated with fever and shivers. Recurrent cases of erysipelas of leg were excluded, as well as necrotizing dermatitis with epidermitis, necrotizing fasciitis, and chronic dermatitis with epidermitis

Data Collection

A validated questionnaire was used to collect data. Clinical examination and biological tests e.g. HIV and glucose tests were performed for each patient. Following variables were collected for each patient:

- The presence of a point of entry (wound, venous ulcer, grazed dermatitis, intertrigo of intertoe), lymphedema, a past history of phlebitis and arteriopathy.
- The use of bleaching agents (i.e. cutaneous signs or a past history of use of bleaching agents).
- Obesity by determining the average of body mass index (BMI), blood pressure, chronic ethylism, diabetes, and HIV infection.

Statistical Analysis

The editing and processing of data was performed using Microsoft Excel version 2007. The data analysis was performed using IBM SPSS 20.0 statistical analysis software. The descriptive analysis (univariate, bivariate) was used to determine the Odds ratio (OR) between the occurrence of gross local complications (necrotizing fasciitis and abscess complication of erysipelas) and patient characteristics. The 95 % confidence intervals

generated, and/or statistical tests (Chi² of Pearson or Fisher) were used to assess the association between these variables.

Ethics Statement

This study was performed on human subjects; thus, all patients were aware of the presence of the study and they were fully informed about the drug and its side-effects.

RESULTS

Of the 562 cases of acute erysipelas of the leg recruited in the eight countries, 339 were women, with a mean age of 43.7 ± 16.9 years (15 and 88 years); 104 patients consulted 3 days after the onset of erysipelas and 93 patients consult after 10 days.

A point of entry was found in 485 patients. A neglected wound was found in 324 (66.80%) patients (traumatic wound, grazed dermatitis, vascular ulcer) and intertrigo of intertoe found in 161 (33.19%) patients. The use of bleaching products was detected in 97 (17.3%) patients, lymphedema in 130 (23.1%) patients, and varicose veins of the lower limb in 19 (3.4%) patients.

Concerning general factors involved with the onset of acute erysipelas of the leg, obesity was found in 230 (40.9%) patients, diabetes in 27 (4.8%) patients and HIV infection in 16 (2.8%) patients. The use of non steroid anti-inflammatory drugs (NSAID) and cataplasms before consultation were detected respectively in 207 and 104 patients (Table 1).

Infection of one leg was found in 535 patients, and especially the right leg in 335 patients; both right and left legs were infected in 27 cases. A lymph node was present in 336 patients, and fever ($> 37.8^{\circ}\text{C}$) in 424 patients.

Of the 562 recruited patients with erysipelas of the leg, 95 were associated with bullous lesions, and 167 were associated with purpuric lesions.

Complications were observed, mainly necrotizing fasciitis in 31 patients (6.1%) and abscesses in 63 patients (11.2%). They were due mainly to the delay of antibiotics treatment, and the use of non steroid anti-inflammatory drugs and cataplasms (Table 2).

DISCUSSION

In this study we described epidemiological and clinical characteristics of acute erysipelas of the leg in patients who consulted in hospitals in eight sub-Saharan Africa

Table 1: Prevalence of risk factors in patients with erysipelas of the leg

	Non complicated forms n=465	NF n=34	Abscess n=63	Total n=562
General factors				
Obesity (BMI ≥ 30 Kg/m ²)	202 (43,4)	5 (14,7)	23 (36,5)	230 (40,9)
Chronic ethylism	16 (3,4)	0 (0,0)	2 (3,2)	18 (3,2)
Diabetes	25 (5,4)	0 (0,0)	2 (3,2)	27 (4,8)
Sedentariness	65 (13,9)	8 (23,5)	12 (19,0)	85 (15,1)
Tabagism	18 (3,9)	4 (11,8)	7 (11,1)	29 (5,2)
HIV infection	15 (3,2)	0 (0,0)	1 (1,6)	16 (2,8)
Clinical factors				
Pitting edema	97 (20,9)	13 (38,2)	20 (31,7)	130 (23,1)
Varicose veins	16 (3,4)	1 (2,9)	2 (3,2)	19 (3,4)
Arteriopathy	3 (0,6)	1 (2,9)	1 (1,6)	5 (0,9)
Use of bleaching products	90 (19,4)	2 (5,9)	5 (7,9)	97 (17,3)
Point of entry	414 (89,0)	24 (70,6)	47 (74,6)	485 (86,3)
Phlebitis	2 (0,4)	0 (0,0)	0 (0,0)	2 (0,4)
Surgery of the leg	2 (0,4)	2 (5,9)	2 (3,2)	6 (1,1)
Aggravating factors				
Delay of antibiotic treatment 3-10 days	263 (56,6)	9 (26,5)	23 (36,5)	295 (52,5)
Delay of antibiotic treatment >10 days	44 (9,5)	21 (61,8)	28 (44,4)	93 (16,5)
The use of NSAID	154 (33,1)	18 (52,9)	35 (55,6)	207 (36,8)
The use of cataplasms	66 (14,2)	17 (50,0)	21 (33,3)	104 (18,5)

NF: Necrotizing fasciitis; BMI: Body mass index; NSAID: Non steroid anti inflammatory drugs; HIV: Human immunodeficiency virus

countries. The main risk factors associated with local complications of acute erysipelas of the leg were the delay of antibiotics treatment, the use of NSAID and the use of cataplasms before consultation.

The limitation of our study was mostly based upon the fact that this was not a comparative study; and also patients' long-term follow-up was not highlighted, so complications as recurrences and sequelae were not detected.

In our study the prevalence of acute erysipelas was 562 cases in a 12 months period, with a mean frequency of 6 cases per months and per dermatology service; this implies that erysipelas of the leg are common in sub-Saharan Africa. The high occurrence of erysipelas of the leg in women observed in this study has been also reported in previous studies [5-10]. The main risk factors were existence of a point of entry (86.3%), obesity (40.9%), lymphedema (23.1%) and the use of bleaching agents (17.3%).

In a previous sub-Saharan African case-control study, obesity, lymphedema, use of bleaching agents, neglected traumatic wound and intertrigo of intertoe were the identified risk factors [11]. Mahé et al had detected a point of entry in 100% of patients [10], that was also reported in two African monocentric studies by Cissé et al in Guinea Republic and Saka et al in

Table 2: Risk factors associated with complications of erysipelas of the leg

N=562	Local complications		OR	95% IC	p
	Yes	No			
Risk factors associated with necrotizing fasciitis					
Delay of antibiotic treatment					
<3 days (104)	3 (2,9)	101 (97,1)	1	[0,28–3,99]	<0,001
3-10 days (295)	9 (3,1)	286 (96,9)	1,06	[2,82–34,17]	
>10 days (93)	21 (22,6)	72 (77,4)	9,82		
The use of NSAID before consultation					0,045
Yes (207)	18 (8,7)	189 (91,3)	2,02	[1,01–4,05]	
No (355)	16 (4,5)	339 (95,5)	1		
The use of cataplasms before consultation					<0,001
Yes (104)	17 (16,3)	87 (83,7)	5,07	[2,49–10,32]	
No (458)	17 (3,7)	441 (96,3)	1		
Risk Factors associated with abscess complication of erysipelas of the leg					
Delay of antibiotic treatment					
<3 days (104)	8 (7,7)	96 (92,3)	1	[0,44–2,33]	<0,001
3-10 days (295)	23 (7,8)	272 (92,2)	1,01	[2,22–12,05]	
>10 days (93)	28 (30,1)	65 (69,9)	5,17		
The use of NSAID before consultation					0,001
Yes (207)	35 (16,9)	172 (83,1)	2,38	[1,40–4,04]	
No (355)	28 (7,9)	327 (92,1)	1		
The use of cataplasms before consultation					0,001
Yes (104)	21 (20,2)	83 (79,8)	2,51	[1,41–4,45]	
No (458)	42 (9,2)	416 (90,8)	1		

NSAID: Non steroid anti inflammatory drugs

Togo, respectively in 80% and 85,6% of patients [6,7]; these African authors also detected HIV infection in 18 % and 27 % of patients. In our multicentric study, HIV infection was associated with erysipelas of legs in 2.8 % of patients; this result reflects the prevalence of HIV infection in sub-Saharan Africa [12]. The use of bleaching products is a current practice in sub-Saharan Africa with prevalence of 25% to 60 % [13-15]. This factor was associated with erysipelas of the leg in 17.3% of patients in our study, while it was reported in Guinea republic and Togo respectively in 32 % and 10.6 % of patients [6,7]. This association may be explained by skin atrophy and fragility and a probable cutaneous immunosuppression due to the use of bleaching products by patients, then leads to erysipelas of the leg.

We reported abscess complication in 11.2% of patients. This is a common complication of erysipelas of the leg. A twenty years period metaanalysis found abscess and necrosis in 3% to 12 % of erysipelas of the leg [16]. Other studies conducted by Krasagakis et al [17], Picard et al [9], Mahé et al. [10] and Crickx et al. [18] have reported this complication respectively in 31.7%, 7.9 %, 9.9 % and 3.6% of patients, unlike in the Togo monocentric study where abscess complication was found only in 04% of patients. Abscess complication is the main factor of morbidity of erysipelas of the leg; it increases the time of hospitalization as well as the cost of healthcare.

We also found necrotizing fasciitis in 6.1% of cases, which was also reported in Guinea republic and Togo respectively in 4.5 % and 7.8 % of patients [6,7]. Nevertheless some necrotizing fasciitis are acute dermo hypodermatitis that are misdiagnosed for erysipelas of the leg at the early stage of this skin infection. Both infections may be distinguished from each other at their acute stage or by use of imaging tools such as Magnetic Resonance Imaging (MRI).

In our study the main factors associated with local complications were delay of antibiotics treatment, and the use of cataplasms and non steroid anti-inflammatory drugs before consultation. Many studies reported the delay of antibiotics treatment as a main risk factor associated with local complications and particularly with abscess complications [5,9,17,18]. Delay of antibiotics allows the bacteria to reach the deep layers of the skin, and then increases the risk of abscess complications. More than 52 % of patients were treated with NSAID before consultation. NSAID may worsen or mask the severity of erysipelas as reported

by many authors. Cissé et al. reported necrotizing complications mostly associated with NSAID [7] (OR=27; CI 95%: 8-94). However Pitché et al. and Crickx et al. did not mentioned the promoting or worsening effects of NSAID in patients [5,18]; these are not yet scientifically proven.

At last, the use of cataplasm was associated with local complications in patients in our study; meanwhile its etiopathogenic role is not proven. Cissé et al. in their study described necrotizing fasciitis in all their 11 patients who used cataplasm before consultation [6].

The role of NSAID and the use of cataplasm in the onset of complications deserve to be confirmed by others studies.

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Statement of Human and Animal Rights

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008.

Statement of Informed Consent

Informed consent was obtained from all patients for being included in the study.

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