

## Comparative Study of Necrotizing Bacterial Dermohypodermatitis or Necrotizing Fasciitis Depending on the HIV Serostatus in Abidjan (Cote d Ivoire)

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Received Date:29 June, 2014;Accepted Date:22 Sept, 2014;Published Date:29 Sept 2014

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### Abstract

#### Introduction

HIV infection modifies ordinary epidemiological, clinical and progressive aspects of infectious diseases. Moreover, in Sub-Saharan Africa owing to the fact that people consult health centers at a late stage of the disease, such pathologies are subject to modification. This applies to necrotizing bacterial dermohypodermatitis or necrotizing fasciitis. This study was conducted in order to compare epidemiological, clinical and progressive aspects of patients with necrotizing bacterial dermohypodermatitis or necrotizing fasciitis depending on their HIV status.

#### Tools and methods

This was a retrospective descriptive and analytic study on patients admitted into hospital from January 1, 2005 to December 31, 2011 at the Department of Dermato-venerology of the Teaching Hospital of Treichville. We included patients admitted into hospital over that period for Necrotizing Bacterial Dermohypodermatitis or Necrotizing Fasciitis who knew their HIV status.

#### Results

Over this period of 7 years, 235 cases of necrotizing bacterial dermohypodermatitis or necrotizing fasciitis were recorded i.e. 34 cases per year. HIV serostatus was conducted in 83 patients (35.3%) of whom 37 HIV positive (44.6%) and 46 HIV negative (55.4%). The average age of HIV positive patients was statistically lower (40.97 years) than that of HIV negative patients (51.99 years) ( $P=0.0015$ ). Lower limbs were the main sites in HIV positive patients (93.93%) as well as in HIV negative patients (95.55%). There is no significant difference as related to atypical sites. HIV positive patients developed more complications (16 cases) than HIV negative patients (05 cases) with  $P=0.000004$ . These complications were mainly septicemia (62.5%) of HIV positive patients whereas scabs (60%) were more frequent in HIV negative patients. The death rate was statistically higher in HIV positive patients (29.72%) than in HIV negative patients (2.17%) with  $P=0.00038$ .

#### Conclusion

Necrotizing Bacterial Dermohypodermatitis or Necrotizing Fasciitis associated with HIV affected relatively young people. Apart from the evolution related to the late treatment with a high death rate in HIV positive patients, clinical signs were less modified depending on the serological status in our contexts.

**Keywords:** Necrotizing bacterial dermohypodermatitis; Necrotizing fasciitis; HIV

### Introduction

Necrotizing bacterial dermohypodermatitis or necrotizing fasciitis is a non-suppurative necrotizing infection affecting the hypodermis, the muscular apo neurosis and subsequently the dermis. It may lead to

death within 18 hours under certain conditions [1]. It is thus a dermatological emergency. But unfortunately it is not the case in the tropical setting in Abidjan. Often patients go to hospital at a late stage of the disease with complications.

Necrotizing bacterial dermohypodermatitis or necrotizing fasciitis infection is favored by some factors namely immunosuppression of which HIV infection constitutes the main cause in Sub-Saharan Africa. Moreover HIV infection modifies the clinical expression of various

infectious pathologies described in the literature of which necrotizing bacterial dermohypodermatitis or necrotizing fasciitis [2]. This fact led us to wonder if the immunosuppression related to HIV would modify the usual expression of necrotizing bacterial dermohypodermatitis or necrotizing fasciitis in tropical countries in Abidjan where often people come for consultation at a late stage of the disease due to some socio-cultural considerations.

This study was conducted in view of describing the main characteristics of patients with necrotizing bacterial dermohypodermatitis or necrotizing fasciitis depending on the HIV serostatus in our context. More specifically, the aim was to compare epidemiological, clinical and progressive aspects of necrotizing bacterial dermohypodermatitis or necrotizing fasciitis patients depending on the HIV serostatus.

## Tools and Methods

This was a retrospective descriptive and analytic study conducted on the medical records of patients admitted into hospital from January 1, 2005 to December 31, 2011 at the Department of Dermato-venereology of the Teaching Hospital of Treichville. The study population was made up of all the patients, irrespective of their gender or age, admitted into hospital for necrotizing bacterial dermohypodermatitis or necrotizing fasciitis. We included in the study all the patients whose HIV status was known and entered in their medical records.

The parameters of interest in the study were: epidemiological, clinical and progressive. We considered as unusual sites the presence of the disease on sites other than the limbs. All the data related to patients were collected by means of standardized forms. All the personal, clinical and progressive data were recorded and processed in strict confidentiality. Data were compiled and analyzed using the software EPI INFO version 3.5.1. Comparisons were conducted on HIV positive and HIV negative patients. Statistical tests were conducted with the program EPITABLE from EPI INFO 6.0. Differences between two groups were assessed using the Chi-square Test or the Fischer Test for proportions and the Student's t-test for averages. A P-value less than 0.05 were considered to be statistically significant.

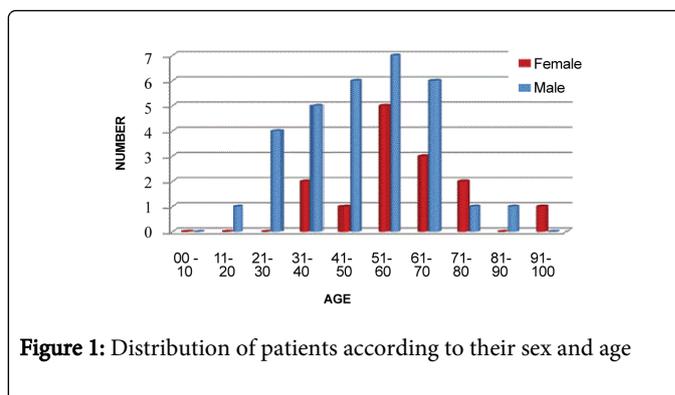
## Results

Over the said period, 368 patients with acute bacterial dermohypodermatitis were admitted into hospital (7 years) i.e. 52.5 cases per year (1 case/week) of whom 235 patients with necrotizing forms (34cases/year) and 93 non-necrotizing forms (13.3 cases per year). Of the Necrotizing Bacterial Dermohypodermatitis or Necrotizing Fasciitis, the HIV serostatus test was conducted in 83 patients (35.3%, n=235) of whom 35 positives (44.6%, n=83) and 46 negatives (55.4%, n=83).

### HIV negative Patients

#### From epidemiological perspective

Of the 46 patients, none had conducted the HIV screening before being admitted into hospital. The average age was 51.91. The sex-ratio was 2.1. They were predominantly male patients of all age brackets up to 70 years (Figure 1).



**Figure 1:** Distribution of patients according to their sex and age

#### From clinical perspective

Necrosis was found in lower limbs in 43 patients (93.5%) and in upper limbs in 2 patients (4.3%) and one case of unusual site (buttock). There were three (3) bilateral cases of limb affection (6.5%), 3 segments of the limb were affected in 3 cases (6.5%), 2 segments of the limbs were affected in 23 cases (50.0%) and 1 segment of the limb was affected in 16 cases (34.8%).

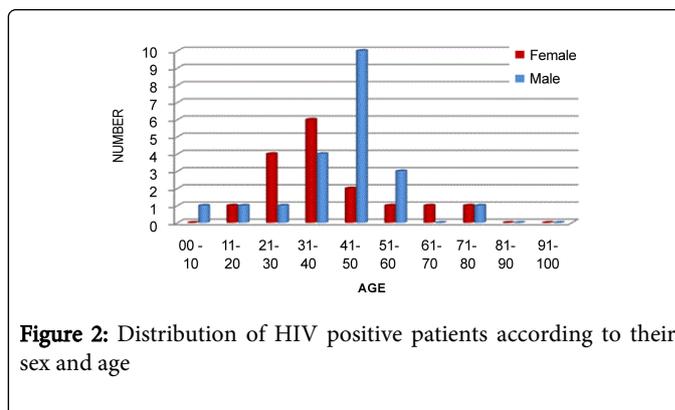
#### From progressive perspective

We recorded 4 (i.e. 8.7%) complications; they were essentially scabs. The average time spent in hospital was 90.42 days. We noticed 1 case of death (2.2%).

### HIV positive patients

#### From epidemiological perspective

Of the 37 HIV positive patients, 13 (35.1%) knew already their serological status and 7 (19%) were under triple therapy. The average rate of CD4 was 282.40 elements/mm<sup>3</sup> ranging from 1 to 1221 elements/mm<sup>3</sup>. The average age was 40.97 years. The sex-ratio was 1.3. There was a male predominance peak in the age bracket of 40-50 years whereas a female predominance was noticed in the age bracket 2-40 years (Figure 2).



**Figure 2:** Distribution of HIV positive patients according to their sex and age

#### From clinical perspective

Lesions were located in lower limbs in 32 cases (86.4%), in upper limbs in 2 cases (5.4%) and there were unusual locations in 3 cases (8.1%) of which one in the chest (Figure 3), 1 in the back and 1 in external genitals (Fournier Gangrene).



**Figure 3:** Necrotizing fasciitis of the chest in a HIV positive patient (Photo Pr Ecra EJ)

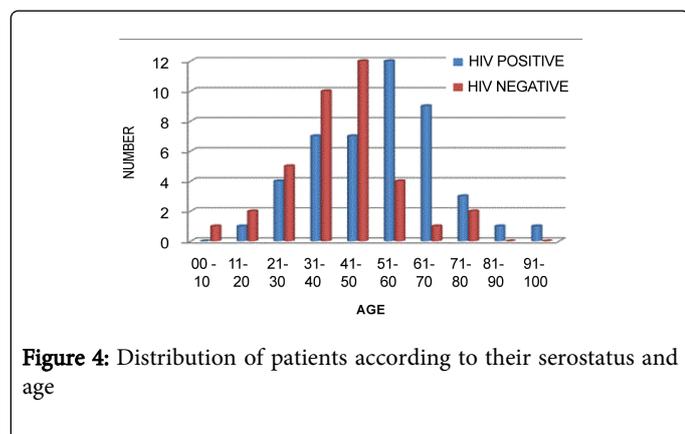
There was one case of bilateral affection of limbs (2.7%), 3 segments of limbs were affected in 3 patients (8.1%), 2 segments of limbs were affected in 22 patients (59.4%) and 1 segment of the limb in 8 patients (21.6%).

### From progressive perspective

There were 16 complications (43.2%) of which, septicaemia in 13 cases (81.3%, n=16) and 3 cases of abscess (18.7%, n=16). The average duration of hospital admission was 62.48 days. The mortality rate was 29.7% (11 deaths).

### Comparative study

There were more HIV positive patients than HIV negative patients before 50 years and this tendency was reversed after 50 years (Figure 4).



**Figure 4:** Distribution of patients according to their serostatus and age

Statistical tests (Table 1) were significant for the mean age (p=0.0015), complications (p=0.000004) and the mortality rate (p=0.00038)

### Discussion

Over the aforesaid period of 7 years, only 35.3% of our patients with necrotizing bacterial dermohypodermatitis or necrotizing fasciitis were screened for HIV infection. This realization rate was similar to that of a study conducted in Lome, TOGO where it was 35.7% in 104-case series [3,4]. It was low compared with the WHO recommendations, which requires, that all the patients should systematically be screened for HIV in the medical environment.

That is all the more important as 44.6% of our patients and 27.08% in Togo had a positive HIV serostatus and received full medical coverage. This high rate of HIV seroprevalence among our patients with necrotizing bacterial dermohypodermatitis or necrotizing fasciitis requires that we apply the WHO recommendations and health practitioners in this country with a high prevalence rate should be more conscious; especially as at the Department of Dermatology of the Teaching Hospital of Treichville in Abidjan there is an integrated Centre for voluntary counselling and screening. As a matter of fact, according to UNAIDS, Cote d Ivoire has the highest HIV prevalence in West-Africa with 3.4% [3].

The average age of HIV positive patients was 51.99 years. This average age is similar to data contained in the European, Asian and American literature whereas that of African countries is near the average age of HIV positive patients i.e. 40.93 years [4-9]. The difference observed between the different continents could be explained by the high prevalence of HIV in Sub-Saharan Africa with the highest rate in young people. The same applies to the significant difference in ages between HIV+ and HIV- (Table 1) and super imposable to HIV distribution in Sub-Saharan populations. A female predominance was reported by many African authors whereas European, Asian and American studies found a male predominance as in our study notwithstanding the HIV status [4,7-12].

	HIV+ (n=37)	HIV- (n=46)	P	
<b>Age (average)</b>	40.97 [8-17]	51.91 [19]	0.0015	
<b>Sex</b>	<b>Female</b>	16	15	0.31
	<b>Male</b>	21	31	
<b>Number of limb segments affected</b>	<b>1 segment of limb</b>	8	16	0.18
	<b>2 segments of limb</b>	22	23	0.38
	<b>3 segments of limb</b>	3	3	0.88
	<b>bilateral</b>	1	3	0.77
<b>Unusual sites</b>	3	1	0.46	
<b>Complications</b>	16	4	0.000004	
<b>Death rates</b>	29.7%	2.2%	0.00038	
<b>Average duration of hospitalization</b>	62.48	90.42	0.056	

**Table 1:** Comparative study of patients with Necrotizing Bacterial Dermohypodermatitis or Necrotizing Fasciitis according to their HIV serostatus

Lower limbs were the favorite sites of necrotizing fasciitis as reported by many authors as well as in our study notwithstanding the serologic status [13-16]. The mode of living of populations could account for such observations as the preferential sites of the pathology are lower limbs' entry points (intertrics intertrigos, chronic leg ulcer, pruritic excoriating dermatosis and minimal injuries). There is no significant difference as related to the number of limb segments infected according to the serological status which could lead to suspect HIV infection in our patients (Table 1). However, the quasi-totality of sites apart from limbs occurred in HIV positive patients; which lead us

to say that unusual sites are merely found in HIV positive patients in our study population. Many authors reported cases of unusual location of necrotizing fasciitis regarding the HIV status [17-20]. In our study, HIV positive patients developed significantly more complications (Table 1) of septicemia type justifying the more frequent diffusion of germs in immunosuppressed. This high rate of complications in immunosuppressed patients could account for the high death rate with significant difference between the two groups (Table 1).

Scabs observed in HIV negative patients more than in HIV positive patients were probably related to the advanced age of patients with decubitus complications. The average duration of HIV negative patients' hospitalization was about 3 months against 2 months for HIV positive patients. These two averages are by far above other averages in the western literature [5-8,11,12,14,16] but super imposable to African studies [4,9,10]. This could be explained by the duration and the mode of treatment of patients. In Western countries, necrotizing fasciitis constitutes actual medical and surgical emergency cases whereas in Africa consultation at a late stage of disease and the lack of financial means delay the coverage of this pathology. The high rate of death in the HIV+ group reduces also the duration of hospitalization in the same group, in which, as a rule treatment does not go up to skin grafting.

## Conclusion

Necrotizing bacterial dermohypodermatitis or necrotizing fasciitis associated with HIV occurred in relatively young patients. A part from the evolution related to the late coverage with a high death rate in HIV positive patients, clinical signs were less modified according to the HIV status in our contexts. The request of HIV serostatus should be systematic before any case.

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