

# Prevalent dermatoses during the post-electoral crisis in Côte d'Ivoire

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## ABSTRACT

**Background:** The 2000–2011 period was for Côte d'Ivoire a period of sociopolitical crisis resulting from an electoral dispute. Skin diseases have long been recognized as an important cause of morbidity among the military, in times of conflict or peace, regardless of their geographic location. In the literature, we found no study on the prevalence of dermatoses in the civilian population during or after the war. In this study, we sought to describe the sociodemographic characteristics of patients and determine the dermatoses observed during this period. **Materials and Methods:** We conducted a retrospective database study of patients who consulted the dermatology department of the CHU of Treichville from April 18 to July 18, 2011. Data collection was performed with a survey form. The data collected was analyzed with EpiData 3.0. **Results:** We analyzed the files of 1755 patients and found that 56.75% were males and 43.25% were females. Teenagers and young adults aged 15 to 49 were the most numerous to consult (71.11%). A total of 1923 dermatoses were diagnosed. The five most frequent dermatoses observed were as follows: immunoallergic dermatoses (35.36%), infectious (bacterial, mycotic, parasitic, and viral) and tropical dermatoses (27.04%), inflammatory dermatoses (7.23%), skin tumors (4.52%), and sexually transmitted infections and dermatoses associated with HIV/AIDS (4.26%). **Conclusion:** The spectrum of dermatoses in the city of Abidjan following the sociopolitical crisis was similar to that prevailing in most large African cities, as industrialization and better living conditions had reduced the prevalence of infectious dermatoses while increased immunoallergic pathologies.

**Key words:** dermatoses; post-electoral crisis; Côte d'Ivoire

## INTRODUCTION

The 2000–2011 period was for Côte d'Ivoire a period of a sociopolitical crisis resulting from an electoral dispute. It caused the massive displacement of the population resulting in household promiscuity, which put individuals at risk of transmissible pathologies, including dermatoses. The immediate consequences of the post-electoral crisis in Côte d'Ivoire were unprecedented in the country's history. It led to the disorganization of the health system, education, and the economy. At the end of the war, the new government decided on the policy of free care in public, parapublic, and community-based health establishments [1]. As a

result, people, even if the need was not real, stormed the aisles of hospitals and other health centers. Free care began in the dermatology department of the CHU of Treichville on April 16, 2011. Very quickly, the number of patients increased and the medical staff were overwhelmed. The staff had to deal with the dissatisfaction of patients, the supply of care having momentarily exceeded the strong demand.

Skin diseases have long been recognized as an important cause of morbidity among the military, in times of conflict or peace, regardless of their geographic location [2]. In the eighteenth century, scabies was considered a universal affliction of the military

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profession. Infectious dermatoses account for the vast majority of wartime skin diseases. Field conditions such as heat, humidity, cold, and lack of hygiene may cause the dramatic exacerbations of these conditions in times of war [3]. Their diagnosis is generally simple and their treatment is of extreme importance, not only for the individual yet also, and especially, for the community, since the rapid cure of an infection is the surest way to prevent its spread [4].

In the literature, we found no study on the prevalence of dermatoses in the civilian population during or after a war. Our study on the prevalence of dermatoses in the general population after the Ivorian crisis, therefore, seems to be an original work. Through this study, we sought to describe the sociodemographic characteristics of patients and determine the dermatoses observed during this period.

## METHODOLOGY

Côte d'Ivoire is located in West Africa in the northern hemisphere, between the Tropic of Cancer and the equator, and overlooks the Atlantic in the Gulf of Guinea. It is bordered to the north by Mali and Burkina Faso, to the west by Liberia and Guinea, to the east by Ghana, and to the south by the Atlantic Ocean. Covering an area of 322,462 km<sup>2</sup>, its political capital is Yamoussoukro, Abidjan being the economic and administrative capital. The country is part of the ECOWAS (Economic Community of West African States), where it occupies an important place as a strong link in the economic chain [5].

Our study took place in the dermatology department of the CHU of Treichville, which is the only dermatology center in a public hospital in the city of Abidjan. We evaluated the epidemiological aspects and the prevalence of dermatoses in patients who consulted the department during the first three months following the sociopolitical and post-electoral crisis of 2010–2011.

We reviewed the files of patients who consulted the dermatology department of the CHU of Treichville from April 18 to July 18, 2011 (a period of three months). Data collection was conducted with a survey form. The data collected was analyzed with EpiData 3.0. We collected data from consultation registers. Most of the diagnoses were established after questioning and clinical examination.

## RESULTS

### Sociodemographic Characteristics

We analyzed the files of 1755 patients and found that 56.75% were males and 43.25% were females. Teenagers and young adults aged 15 to 49 were the most numerous to consult (71.11%). In our study, we found that only 17.89% of the patients had a salaried profession, and 33.79% were students or pupils (Table 1). A total of 92.82% of our patients lived in Abidjan. Among the patients residing in Abidjan, a majority (18.06%) came from the Yopougon community, followed by Cocody for 14.99% of the patients; 13.16% of the patients came from Treichville, where the dermatology department is located.

### Clinical Features

The shortest consultation period was two days, while the longest was 10,950 days (approx. thirty years). Only 3.30% of our patients had a dermatological history before the consultation. Depigmentation was the most common medical history, with a percentage of 1.03%. A total of 1923 dermatoses were diagnosed in our 1755 patients. Two (240 patients) and three (16 patients) dermatoses could be diagnosed simultaneously.

The five main groups of dermatoses observed were as follows (Table 2):

**Table 1:** Sociodemographic characteristics of the population

Sociodemographic characteristics	Number	Percentage (%)
Sex	1755	100
Male	996	56.75
Female	759	43.25
Age		
< 5 yrs.	120	6.84
5–14 yrs.	162	9.23
15–49 yrs.	1248	71.11
> 50 yrs.	204	11.62
(unknown)	21	1.20
Profession	1755	100
Salaried	314	17.89
Informal sector	464	26.44
Agro-pastoral	15	0.85
Student /pupil	593	33.79
Unemployed	64	3.65
Housemaid	181	6.15
(unknown)	108	10.31
(N/A)	16	0.91
Residence		
Abidjan	1629	92.82
other city	102	5.81
(unknown)	24	1.37

**Table 2:** Different dermatoses observed

Dermatoses	Frequency	Percentage (%)
Immunoallergic dermatoses	680	35.36
Infectious (bacterial, mycotic, parasitic, and viral) and tropical dermatoses	520	27.04
Inflammatory dermatoses	139	7.23
Skin tumors	87	4.52
Sexually-transmitted infections and dermatoses associated with HIV/AIDS	82	4.26
Other dermatoses	415	21.59
Total	1923	100

- Immunoallergic dermatoses (35.36%);
- Infectious (bacterial, mycotic, parasitic, and viral) and tropical dermatoses (27.04%);
- Inflammatory dermatoses (7.23%);
- Skin tumors (4.52%);
- Sexually-transmitted infections and dermatoses associated with HIV/AIDS (4.26%).

Eczema (14.61%) was the most common immunoallergic dermatosis in our study. We also found one (0.05%) case of dermatomyositis and one (0.05%) case of scleroderma, which are relatively rare pathologies. Among the infectious dermatoses, mycoses (11.87%) were the most frequent. Buruli ulcer (0.15%) was the most frequently noted tropical dermatosis. Lichen planus (1.92%) was the most common inflammatory dermatosis. Keloid scars (2.60%) were the most common benign skin tumors. Actinic keratoses (0.15%) were the most common malignant skin tumors. Condyloma acuminata was the most common sexually-transmitted infection (1.98%); and Kaposi's disease (0.57%) was the most common pathology associated with HIV/AIDS. Hyperpigmented scars (1.35%) were the most common forms of dyschromia, followed by exogenous ochronosis (1.04%). Leg ulcer (0.42%) came first among vascular pathologies. Nineteen (0.99%) cases of alopecia were found, thus representing the most observed pathology of the skin appendages. We also found two cases of neurofibromatosis and three cases of pyoderma gangrenosum, which are relatively rare pathologies.

## DISCUSSION

In the literature, we found no study on the prevalence of dermatoses in the post-conflict civilian population. In our study concerning this segment of the population, our discussion will be on studies performed on black-skinned patients in different countries in times of peace.

The major biases of our study were as follows:

- Free healthcare, as it had led to an increase in the number of patients (over the three-month period, 1,755 patients were studied, which was approx. double the number when compared to the same period the previous year);
- Missing portions of information.

In our study, the proportion of males (56.75%) was higher than females (43.25%). This result is in disagreement with most studies, in particular those by Dlova et al. [6], Ukonu [7], and Yahya [8], in which the proportion of females was significantly higher. Bissek et al. [9] and Mahé et al. [10] found in their studies an almost equal proportion of males and females. The high proportion of females in most studies is due to feminine coquetry. Females are more alarmed to see even small skin abnormalities. We may, therefore, ask ourselves whether the high proportion of males in our study was the result of free healthcare (which led to more males coming for consultation) or the result of growing male coquetry. Adults aged between 15 to 50 years represented 82.73% in our series, while those under 15 years of age represented only 16.07% of the patients. This result is in agreement with all the studies, in particular those by Dlova, Ukonu, and Yahya [6-8], in which adults represented 86.9%, 83.7%, and 79.29% of patients, respectively. The low proportion of children may be explained by the fact that most dermatoses in children are treated by pediatricians and general practitioners and that most cases arriving at the dermatologist are referred by them. All these observations allowed us to conclude that the sociodemographic aspect of dermatoses in post-conflict Côte d'Ivoire differed very little from the period of peace.

In our series, 33.79% of the patients (therefore, a majority) were pupils or students. This result is comparable to that by Bissek et al. [9], who found 37.5% of pupils or students in a study conducted in a rural area of Cameroon. We only found 0.85% working in the agro-pastoral sector versus 47.25% in the study by Bissek et al. [9]. This is explained by the fact that our study took place in Abidjan, which is a highly industrialized urban area.

A total of 92.82% of our patients resided in Abidjan, which is explained by the fact that the dermatology department of Treichville, the only dermatology reference center in Côte d'Ivoire, is located in Abidjan. Among these patients residing in Abidjan, 51.29% of

our patients came from the north of Abidjan; therefore, the majority of the municipality of Yopougon (18.06%) and 41.54% of our patients came from the south of Abidjan, thus the vast majority of the municipality of Treichville (13.16%). One would normally expect that there would be many more patients coming from the north of Abidjan (the largest and most populated part of the city of Abidjan) than from the south.

This narrow margin (9.75%) between patients coming from the northern and southern part of the city may be explained by the fact that, in the aftermath of the crisis, the municipalities of Yopougon and Abobo located north of the city and the most populous were not yet in the hands of government forces. The patients declaring that they came from the community of Yopougon were in fact in the vast majority of those displaced by war.

In our study, the consulting period ranged from two days to thirty years. This may be explained by the following facts: Not everyone is familiar with dermatology. Skin diseases are most often considered by many as aesthetic problems and, therefore, pushed into the background. More than one has found in free care a way to get to the dermatologist even if the problem has existed for many years.

Only 3.3% of our patients had a dermatological history, voluntary depigmentation was the most found history. A dermatological history is not systematically requested on dermatology consultation. The high rate of voluntary depigmentation indicates the extent of this phenomenon in our society.

Immunoallergic dermatoses were the most frequent in our series; the same has been the case in most African countries since the end of the twenty century [8,11-14]. Industrialization and growing urbanization in major African cities since independence have led to an improvement in living conditions on the one hand, yet on the other these have led to a change in diet and exposed the populations living there to irritants and pollutants, explaining the high prevalence of these dermatoses. It is the same for the city of Abidjan, in which this state of affairs has not changed despite the sociopolitical crisis that shook the country. Infectious and tropical pathologies come second in our study. Fungal diseases were the most common in this group (11.87%); this observation was also made by Bissek et al. (25.4%) [9], Nnoruka (10.2%) [10], Dlova et al. [6], Fekete (13%) [15], Yahya (12%) [8], Shibeshi (15.61%) [14]. This may be explained by the fact that

Côte d'Ivoire is located in a tropical zone with a hot and humid climate conducive to the development of this type of pathology. The abusive and uncontrolled use of depigmenting topicals may also be a significant cause. Among the 4.05% of parasitoses that we found, scabies was the most frequent (3.95%). Our result was higher than that observed in most studies. Between 1973 and 2005 [8,15], the prevalence of scabies fell from 11.5% to 1.4% in the Kaduna region of Nigeria. Bissek et al. [9] found in 2010 a prevalence of 2.82% in rural areas, and Nnoruka [12] found a prevalence of 1.91% between 1999 and 2001. This high prevalence of scabies in our series may be explained by the overcrowding and deterioration of living conditions generated by the sociopolitical crisis. In addition, we only found two (0.10%) cases of leprosy, three (0.15%) cases of Buruli ulcer, and one case of mycetoma. As in Côte d'Ivoire, in most African countries today, there is a low prevalence of leprosy [8,14]. This is because the pathology is almost eradicated and the few remaining cases are supported by specialized structures and bodies. It is the same for Buruli ulcer, in which the disease is rampant in rural areas, and in this area, primary care structures exist. The cases seen in the dermatology department of Abidjan often come from the outskirts of the city or are serious cases referred from areas of high endemicity. Côte d'Ivoire is not an endemic area for mycetoma, hence its especially low prevalence.

Among inflammatory dermatoses, the most frequent pathology was lichen planus (1.92%), a result comparable to that by Nnoruka (4.8%) [12], Fekete (5.2%) [15], and Ogunbiyi et al. (3.4%) [16]. We only found 0.41% of cases of psoriasis. This result was similar to most studies done on patients with dark phototypes [6,8,14,15], confirming the low prevalence of this pathology among the black race. The Ivorian crisis, therefore, had no influence on the occurrence of these pathologies, although one might expect the contrary because of the psychosomatic nature of some (lichen planus, psoriasis, pityriasis rosea of Gibert).

The keloid scar (2.60%) was the most common benign tumor in our series. This result was comparable to that by Nnoruka (3.7%) [12]. Moreover, it was higher than that by Yahya (0.7%), Doe et al. (0.22%), Dlova et al. (0.84%), Ogunbiyi et al. (1.5%) [6,8,16,17]. The keloid scar is a particularity of people with dark phototypes, and it is a real problem for these patients because of the pain it may cause and its unsightly character. The low rates in some studies may be explained by the fact

that other medico-surgical disciplines also support this pathology. We found one (0.05%) case of plantar melanoma and three (0.15%) cases of actinic keratosis. In a study by Doe et al. [17], comparing dermatoses in Ghana and the United Kingdom, the incidence of malignant tumors in Ghana was 0.5% (no cases of melanoma) versus 22% in the United Kingdom (dominated by basal cell carcinoma). Dlova et al. (South Africa), and Nnoruka (Nigeria) [6,12] found 0.2% and 0.5% of skin tumors, respectively. Our result was similar to previous ones, confirming the low prevalence of cancers on black skin [18].

Our study was comparable to that conducted by Nnoruka [12] in Nigeria between 1999 and 2001, which found a prevalence of STIs/HIV-related dermatoses to be at 5.4%. In comparison to other studies: Nnoruka (0.31%), Mahé et al. (0.19%), Bissek et al. (0.40%) [9,10,12], we find that the prevalence of Kaposi's disease (0.57 %) is higher in ours. This may be explained, on the one hand, by the high prevalence (4.7%) of HIV/AIDS in Côte d'Ivoire, the most affected country in the West African subregion and, on the other, by the free healthcare with a high number of patients. Condyloma acuminata (1.98 %) was the most found STI in our study. This may be explained by the fact that the treatment is most often by cryotherapy or electrocoagulation. In Abidjan, dermatologists are sometimes the only to master these therapeutic techniques. The other STIs probably benefit from syndromic treatment at the level of peripheral health centers.

In our series, we found eighteen (0.94%) cases of exogenous ochronosis, a consequence of the abusive use of hydroquinone-based topical products with the intention to lighten one's skin. The prevalence of exogenous ochronosis in our series was similar to that found by Nnoruka (1.35%) in Nigeria and Doe et al. (0.88%) in Ghana; it was, nevertheless, lower than in Mali (3.80%) [10,12,17]. This relatively high rate of exogenous ochronosis in the different cities, including Abidjan, may be explained by the free sale of lightening topical products, which is accentuated by the media (abusive advertisements on the issue, erroneous images of beauty and social success). This sector has, therefore, not suffered as a result of the sociopolitical crisis. Skin depigmentation is a real burden in our society. Much effort remains to be exerted in order to decelerate its development by making populations aware of the dangers involved. In South Africa, the government was able to regulate the use and sale of

products containing hydroquinone; thus, between 1978 and 2010, the prevalence of exogenous ochronosis fell from 10% to 0.05% [6]. Within three months, we found two (0.10%) cases of dermatitis herpetiformis, one (0.05%) case of dermatomyositis, three (0.15%) cases of neurofibromatosis type 1, and two (0.10%) cases of pyoderma gangrenosum, which are relatively rare pathologies. This may be explained by the free care, which has pushed even the poorest patients to consult, hence the high incidence.

## CONCLUSION

The spectrum of dermatoses in the city of Abidjan after the period of the sociopolitical crisis is similar to that prevailing in most large African cities, in which industrialization and the improvement of living conditions have reduced infectious dermatoses while causing an increase in immunoallergic pathologies.

## WHAT IS KNOWN?

- Infectious dermatoses account for the vast majority of wartime skin diseases. Field conditions such as heat, humidity, cold, and lack of hygiene may cause dramatic exacerbations of these conditions in times of war.
- In the literature, we found no study on the prevalence of dermatoses in a civilian population during or after a war. Our study on the prevalence of dermatoses in the general population after the Ivorian crisis, therefore, seems to be an original work. Through this study, we sought to describe the sociodemographic characteristics of patients and determine the dermatoses observed during this period and their frequency.

## WHAT DOES THIS STUDY ADD?

We analyzed the files of 1755 patients and found that 56.75% were males and 43.25% were females. Teenagers and young adults aged 15 to 49 years were the most numerous to consult (71.11%).

- The profile of dermatoses in the city of Abidjan after the period of the sociopolitical crisis is similar to that prevailing in most large African cities, in which industrialization and the improvement of living conditions have reduced infectious dermatoses while causing an increase in immunoallergic pathologies.

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## Statement of Human and Animal Rights

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

## Statement of Informed Consent

Informed consent for participation in this study was obtained from all patients.

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