

Research Article

Dermatoses in Ivorian Rural Areas: A Case Study of the Health District of Zouan Hounien

Diabat éAlmamy^{1, *} , Rie Rosalie Yotsu^{2, 3, 4} , Sule Akanbi Mutiyu¹ ,
Bamba Vagamon^{1, 5} , Aubin Yao⁶ , Ronald Blanton² 

¹Department of Dermatology, Université Alassane Ouattara, Bouaké, Côte d'Ivoire

²Department of Tropical Medicine, Tulane School of Public Health and Tropical Medicine, New Orleans, USA

³School of Tropical Medicine and Global Health, Nagasaki University, Nagasaki, Japan

⁴Department of Dermatology, National Center for Global Health and Medicine, Shinjuku, Japan

⁵Raoul Follereau Institute Côte d'Ivoire, Adzopé, Côte d'Ivoire

⁶Hope Commission International, Abidjan, Côte d'Ivoire

Abstract

Objective: To improve the management of skin diseases in rural areas of the Zouan-Hounien health district. *Materials and Methods:* This was a prospective, cross-sectional, descriptive study conducted over five (5) days, from December 13, 2023, to December 17, 2023, in villages within the Zouan-Hounien health district. *Results:* The study included 558 patients. The age group of 0-5 years was the most represented (16%). There were more women (54%) than men. Majority were farmers (31.4%) and single (52%). Infectious dermatoses were the most common (80.1%), with fungal infections being predominant (42.5%). Scabies was the only parasitic condition (100%), frequently affecting farmers (31.1%) and children aged 0-5 years (47.6%). Among bacterial dermatoses, boils were the most prevalent (66.7%). Molluscum contagiosum was the dominant viral dermatological condition (75%). Urticaria was the leading immuno-inflammatory dermatosis (59.5%), often observed among farmers (16.4%) and the 56-85 age group (24.6%). Lipoma was the only reported tumor-related dermatosis (1 case). There were only six (6) cases of sexually transmitted infections (1.1%). Other dermatoses were primarily sweat rash (44%). *Conclusion:* Skin diseases in rural areas of the Zouan-Hounien were predominantly infections. In light of these findings, it is necessary to strengthen the capacity of paramedical personnel to improve the management of skin diseases in rural settings. In the absence of a specialist in every village, implementing tele dermatology should be considered to bridge this gap.

Keywords

Dermatoses, Rural Areas, Zouan-Hounien

*Corresponding author: docalmamy@yahoo.fr (Diabaté Almamy)

Received: 17 December 2024; **Accepted:** 2 January 2025; **Published:** 23 January 2025



1. Introduction

Skin diseases are a major public health issue in tropical countries, particularly in Côte d'Ivoire, where they represent the fourth leading cause of medical consultations in urban areas [1]. In rural areas, some studies estimate that the prevalence of skin diseases in developing countries ranges from 50% to 80% [2]. When untreated, skin diseases can sometimes lead to comorbidities, morbidity, and disability. These outcomes can result in stigmatization and work incapacity. Furthermore, their management entails significant social and economic costs, which negatively impact the achievement of the Sustainable Development Goals (SDGs) as recommended by the United Nations in September 2015.

Additionally, in West Africa, especially in the Ivory Coast, dermatologists are concentrated in large cities, leaving smaller towns and villages without specialist practitioners. As a result, 90% of skin disease cases are managed by nurses who have received only minimal basic training. This shortage of specialist physicians is a common issue in African countries [2].

This gap between the high prevalence of skin diseases [2] and the unequal distribution of dermatologists is a concern. To address this disparity, the World Health Organization (WHO) advocates for an integrated approach to combating skin diseases. In Côte d'Ivoire, few studies have been conducted on skin diseases in rural areas. This observation led to the idea of this study, which aimed to actively investigate skin diseases in the Zouan-Hounien health district. The goal was to improve the management of skin diseases, with the specific objective of identifying dermatoses in rural settings.

2. Materials and Methods

From December 13 to December 17, 2023, we conducted a cross-sectional study on skin diseases. The study was carried out in eight villages within the Zouan-Hounien health district. This health district, located in the Tonpki region in the western part of Côte d'Ivoire, hosts a significant site for leprosy care.

The mobilization of patients was organized by village authorities and the district health director. The survey involved documenting patients presenting skin conditions during field consultations. Therefore, patients of all ages and genders, who had skin afflictions, were consented to participate and were included in the study.

Patients were examined by a dermatologist. The dermatological diagnosis was based on clinical examination, supplemented, when necessary, by biological tests and skin histopathology. Data were collected through a questionnaire that included demographic variables (age, sex, education, origin), clinical variables (reason for consultation, clinical diagnosis), and biological variables (blood tests, skin histopathology, bacteriological and mycological examinations). Data were entered and analysed using SphinxPLUS V5.tuiTe software.

3. Results

We documented a total of 558 patients, among whom only 9 did not have skin conditions (1.6%). Skin diseases constituted 98.4% of the pathologies encountered. The average age of patients was 32 years, with the age group of 0 to 10 years accounting for 29.8% of cases. Female patients represented 54% of the cases, with a sex ratio (M/F) of 0.85. Non-literate patients accounted for 43.3% of the cases. Regarding occupation, farmers represented 31.4% of the cases. (Table 1).

Table 1. Socio-economic aspect.

		Number of Cases	Percentages
Age bracket (year)	[00-05[87	16
	[06-15[130	24
	[16-85[327	60
Occupations	Farmer	171	31.4
	Students	142	26.1
	No occupation	137	25.2
	Craftsmen	69	12.7
	Managers	25	4.7
	No schooling	198	43.3
Level Education	Primary education	179	39.1
	Secondary	73	16
	Literate	4	1
	Higher education	3	0.6

Regarding marital status, 52% of patients were single. For skin diseases, mycotic dermatoses represented 42.5% of all dermatoses encountered. (Table 2).

Table 2. Distribution of Skin Conditions.

Pathologies	Number of Cases	Percentages	
Infectious	mycotic	237	42.5
	parasitic	191	34.2
	bacterial	15	2.7
	viral	04	0.7
Immuno-inflammatory	79	14.1	
Other skin conditions	25	4.5	

Pathologies	Number of Cases	Percentages
STIs (Sexually Transmitted Infections)	06	1.1
Tumor-like	01	0.2
Total	558	100

Bacterial dermatoses consisted in 66.7% of cases of boils and 20% of impetigo. There was only one case of erysipelas. The only parasitic dermatoses encountered was scabies with 191 cases. For viruses, 3 out of 4 patients had molluscum contagiosum (75%). Urticaria represented 59.5%, contact dermatitis 34.2%, and 5% prurigo strophilus among inflammatory-immune dermatoses. One case of lipoma for tumors. Regarding STIs, 5 out of 6 patients had genital herpes. As for superficial mycoses, pityriasis versicolor represented nearly 45.1% of cases followed by tinea (28.3%) and circinate dermatophytosis (22.4%). The other dermatoses consisted in 44% of cases of sudoral miliaria (Table 3).

Table 3. Distribution of Other Dermatoses.

Other Dermatoses	Total number	Percentage
Burn Scar	01	4
Vitiligo	01	4
Mycetoma	01	4
Polyneurofibromatoses	01	4
Acne	03	12
Depigmentation	07	28
Sweating miliaria	11	44

As a research indicator, neglected tropical diseases (MTN) accounted for 34.2%, dominated by scabies (98%) (Table 4).

Table 4. Cutaneous MTN Recruited During the Study.

MTN	Total Number	Percentage
Scabiose (Scabies)	187	98
Mycetoma	1	0.5
Leprosy (MB)	2	1
Leishmaniasis	1	0.5
Total	191	100

4. Discussion

We recruited 558 patients during this field consultation. The age groups from 0 to 10 years (29.8%) were the most frequent. This could be explained by the fact that young age constitutes a risk factor for the occurrence of several diseases. Additionally, communal play with other sick children are factors that justify the high prevalence of skin diseases in children. Diabate [3] in his study found a predominance of females (79.2%). Similarly, we found a sex ratio of 0.85. We believe that women prioritize their health more than men, which explains their higher presence at consultations.

In this study, the majority of patients were illiterate (52.4%). This result is similar to Diabate's [3] study, which showed literacy rate of 33%. In Côte d'Ivoire, the literacy rate in rural areas is low compared to large cities. The high rate of illiteracy promotes ignorance, which impacts the health of the population. These individuals may take risky health actions without awareness. Whereas urban areas offer diverse job opportunities, rural areas in contrast, are seen as agricultural zones with limited opportunities. This could be why the majority of our patients were farmers (31.4%) and are the most active in rural areas. In fields, they may suffer insect bites, as well as come into contact with allergens that can lead to the development of certain dermatoses. Long walks to fields and agricultural work performed for hours under the sun result in excessive sweating, which fosters the development of mycotic dermatoses [4]. These factors could explain why farmers were the most affected.

The majority of patients (52%) were single. This could be explained by the fact that they were not yet adults and not at an age where they would marry. Indeed, the age group of ≤ 10 years dominated. Our result differs from Diabate's [3] study in Yopougon. Where married individuals were dominant (52.3%). This could be justified that the study only considered subjects aged 18 to over 40 years. These individuals were more likely to be at an age where marriage is common, unlike our group of patients.

Skin diseases are diverse and varied dominated mainly by infectious dermatosis. Our results are similar to those conducted in Tunisia [5, 6], where infectious dermatoses were dominant, particularly mycoses. The high prevalence of these diseases could be attributed to heat, humidity, poor hygiene, excessive sweating, and prolonged use of closed shoes.

Scabies was the only parasitic dermatosis found in 191 cases, and was prevalent among farmers. This could be due to the frequent use of the same clothing for farming work. These clothes are rarely washed, thereby acting as reservoirs for germs. An infected farmer parent may contaminate their children, which may explain the predominance in the age group 0 to 5 years.

The dominance of urticaria among immuno-inflammatory dermatoses was similarly to those noted in other reports [7-9]. This could be attributed to the exposure to some allergens (nettles, etc.) encountered in the fields and plantations, which are favorable factors for the occurrence of urticaria. Also, the

high rate of sweat miliaria could be due to the tropical climate promoting excessive sweating and perspiration. A relative high prevalence of depigmentation was observed, and could be attributed to the fact that most of the participants were women who may have trends for beauty enhancement, hence tend to use whitening products. However, depigmentation is a risk factor for certain bacterial and mycotic infections and acne. This could justify the significant rate individuals with acne observed in our study.

We also found other dermatoses that are not common in practice and that affect rural populations. For cutaneous NTDs, we recruited 4 types of NTDs, mainly scabies, which does not cause disability. This low rate reflects the rarity of The skin manifestation of neglected tropical diseases (MTNC) or their under-recognition, as they evolve in endemic forms causing disabilities [10-13]. Rie [6] in his study identified two types of MTNC.

5. Conclusion

Through our data, children represented the most vulnerable social group in relation to these dermatoses. The prevalence of mycoses compared to other dermatoses highlights this issue. A predominance of females in the studied population and a clinical polymorphism of our dermatosis cases were observed.

Given the above, it is essential to strengthen the capacity of paramedical staff to improve the management of skin diseases in rural areas. In the absence of a specialist in every village, the implementation of tele dermatology could fill this gap effectively.

Abbreviations

MTN	Neglected Tropical Diseases
MTNc	The Skin Manifestation of Neglected Tropical Diseases (NTD)

Acknowledgments

We would like to express our deepest gratitude to the Zouan Houe ñ departmental health director, the chiefs of the villages visited and the health staff in each locality visited.

Author Contributions

Diabate Almany: Conceptualisation, Investigation, Formal Analysis, Writing - original version Writing - revision and editing

Rie Rosalie Yotsu: Supervision, Validation

Sule Akanbi Mutiyu: Investigation, Formal analysis

Bamba Vagamon: Supervision, Validation

Aubin Yao: Conceptualisation, resources

Ronald Blanton: Supervision, Validation

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] HS Kourouma, Kaloga M, Kouassi YI et al. Aspects épidémiologique et clinique des patients vus en consultation de dermatologie du CHU de Treichville [In French]. *j.annder*. 2017; 143(4) (Supp 1): S36.
- [2] Youssouf F, Traoré B, Dicko A, Faye O, Berthé S, Cisse L et al. Profil épidémiologique-clinique des dermatoses chez les enfants vus en consultation dermatologique dans le service de dermatologie du centre national d'appui à la lutte contre la maladie Bamako (Mali) *Pam J*. 2016; 25: 238.
- [3] Diabaté A, Kourouma H, Kouabenan AA, Gué I, Vagamon B, Aka B. Profil épidémiologique, clinique et évolutif des infections parasitaires cutanées superficielles en milieu hospitalier en Côte d'Ivoire. *RISM Abj*. 2018; 20(1): 67-70.
- [4] Walling HW. Primary hyperhidrosis increases the risk of cutaneous infection: a casecontrol study of 387 patients. *J Am Acad Dermatol* 2009; 61: 242-6.
- [5] Souissi A, Zeglaoui F, Zouari B, Kamoun MR. A study of skin diseases in Tunis. An analysis of 28244 dermatological outpatient cases. *ACTA Dermatol Venereol Alp Panon Adriat*. 2007; 16(3): 111.
- [6] Yotsu RR, Kouadio K, Vagamon B, N'Guessan K, Akpa AJ, Yao A, et al. Skin disease prevalence study on schoolchildren in rural Cote d'Ivoire: implications for integration of neglected skin diseases (skin NTDs). *PLoS Negl Trop Dis*. 2018; 12: e0006489.
- [7] Hassan I, Anwar P, Bilquis S, Nabi S, Munshi I, Rasool F. Comparison of dermatoses seen in community health camps and a tertiary care centre in Kashmir. *Indian J Dermatology, Venereol Leprol*. 2014; 80: 214.
- [8] Yaseen U, Hassan I. Prevalence of various skin disorders in school going children of Kashmir valley of North India: a cross-sectional study. *Indian Journal of Pediatric Dermatology*. 2013; 14(3): 67.
- [9] Mitjà O, Marks M, Bertran L, Kollie K, Argaw D, Fahal AH, et al. Integrated control and management of neglected tropical skin diseases. *PLoS Negl Trop Dis* 2017; 11(1): e0005136.
- [10] Bayaki Saka, Pabawé Kassang, Piham Gnossike, Michael Head, Abila Sđako Akakpo, Julienne Noude Teclessou et al. Prevalence of skin Neglected Tropical Diseases and superficial fungal infections in two peri-urban schools and one rural community setting in Togo. 2022. Disponible sur www.medrxiv.org Consulté le 16 septembre 2022.
- [11] Baska Toussia DV. Épidémiologie spatiale des maladies tropicales négligées (lèpre, schistosomiase, filariose lymphatique, vers intestinaux) en milieu sahéen: cas de Maroua (extrême-nord, Cameroun). *Revue Ivoirienne de Géographie des Savanes*, numéro 8 juin 2020.

- [12] Barogui YT, Diez G, Anagonou E, Johnson RC, Gomido IC, Amoukpo H et al. Integrated approach in the control and management of skin neglected tropical diseases in Lalo, Bénin. *PLoS Negl Trop Dis*. 2018; 12(6).
- [13] Msyamboza KP, Mawaya LR, Kubwalo HW, Ng'oma D, Liabunya M, Manjolo S, et al. Burden of leprosy in Malawi: community camp-based cross-sectional study. *BMC Int Health Hum Rights*. *BMC International Health and Human Rights*; 2012; 12: 12.