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Research Article

Epidemiological, Clinical and Bacteriological Profile of Leprosy in Children at the Dermatology University Hospital of Bamako

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Abstract

Introduction: Leprosy remains a public health concern in developing countries such as Mali. In children, it indicates active transmission and may present with atypical clinical forms. This study describes the epidemiological, clinical and bacteriological profiles of pediatric leprosy at the Dermatology University Hospital Center (CHU) in Bamako.

Methodology: This was a retrospective, descriptive, cross-sectional study conducted from January 2020 to December 2024 at the Dermatology CHU of Bamako. It included children aged 0 to 15 years diagnosed with leprosy, either as outpatients or inpatients. Sociodemographic, clinical and bacteriological data (bacilloscopy) were analyzed.

Results: Out of a total of 525 leprosy cases managed at the Dermatology CHU of Bamako, 57 involved children, representing a frequency of 10.84%. The mean age was 11.3 years, with a slight male predominance. The multibacillary form accounted for 68.9% of cases. The most frequent bacteriological indices were 5+ (43.8%) and 4+ (25.1%). The predominant clinical signs were hypopigmented anesthetic lesions and peripheral nerve involvement. Neurological reactions were observed in 16.5% of cases and grade 2 disabilities in 7.5%. A family history of leprosy was found in 33.2% of cases.

Conclusion: Pediatric leprosy remains present in Mali. Early diagnosis is crucial to prevent complications and interrupt transmission. Community-based screening should be strengthened.

Keywords: Leprosy; Child; Epidemiological Profile; Clinical Profile; Bacilloscopy; Mali

Introduction

Leprosy or Hansen's disease, is a chronic infectious condition caused by *Mycobacterium leprae*, a bacterium with neurodermotropic affinity. It primarily affects the skin, peripheral nerves, mucous membranes of the upper respiratory tract, and, in some cases, the eyes [1]. Despite the progress made in combating this disease through the implementation of Multidrug Therapy (MDT), leprosy remains a public health problem in many developing countries, particularly in sub-Saharan Africa, Southeast Asia and Latin America [2].

Leprosy in children is an important indicator of the persistence of community transmission, revealing gaps in early detection and prevention strategies [3]. According to the World Health Organization (WHO), nearly 6 to 10% of new leprosy cases worldwide occur in children under the age of 15, reflecting active transmission of the disease [4]. Pediatric forms of leprosy present particular challenges: diagnosis is often delayed due to sometimes atypical clinical manifestations, limited access to healthcare, a higher risk of irreversible neurological sequelae and social stigma [5].

In Mali, despite the commitment of the National Leprosy Control Program (PNLL) and the integration of care into the primary

health system, the disease has not yet been completely eliminated. Data from the General Directorate of Health report pediatric cases in several regions of the country, notably in Bamako, where the dermatology hospital serves as a national referral center for the management of skin diseases and leprosy in particular [6].

However, specific data on children with leprosy remain limited, both epidemiologically and clinically as well as biologically. It is in this context that the present study was undertaken, with the general objective of examining the epidemiological, clinical and biological aspects of leprosy in children aged 0 to 15 years.

Patients and Methods

This descriptive cross-sectional study with retrospective data collection was conducted at the Dermatology Hospital of Bamako, the national referral center for the management of skin diseases, including leprosy, located in Djicoroni-Para. The hospital provides specialized consultations, hospitalization, care and follow-up for patients with chronic dermatological conditions, particularly leprosy. It includes a dedicated Leprology Department for the diagnosis and treatment of leprosy, with nationally recognized expertise, as well as a reference laboratory for mycobacteriological examinations, notably slit-skin smear microscopy used for leprosy diagnosis. The study focused on the medical records of children aged 0 to 15 years followed for leprosy between January 1, 2020 and December 31, 2025. All children diagnosed and followed for leprosy during this period were included, provided their medical records were complete and contained the necessary clinical and biological information. A pediatric leprosy case was defined according to WHO guidelines as the presence of at least one of the following: hypopigmented or erythematous skin lesions associated with loss of sensation, palpable peripheral nerve lesions, positive slit-skin smear result or characteristic clinical features of multibacillary or paucibacillary forms. Records that were incomplete, unusable or concerned children managed for other dermatological conditions without a leprosy diagnosis or children not followed within the defined period, were excluded. An exhaustive sampling method was used, including all records meeting the inclusion criteria, with data collected using a standardized survey form based on consultation registers, medical records and laboratory results. Variables studied included sociodemographic characteristics (age, sex, geographical origin, ethnicity, BCG vaccination status, family history of leprosy), clinical data (reason for consultation, clinical form, lesion location and number, neurological signs such as paresthesia, anesthesia, nerve hypertrophy or paralysis, WHO classification and Ridley and Jopling classification if available) and biological/bacteriological data (slit-skin smear results, other examinations such as histology, serology or PCR when available). Data entry and analysis were performed using SPSS version 22, with quantitative variables expressed as mean ± standard deviation and qualitative variables as frequencies and percentages; Chi-square or Fisher's exact test could be used for comparisons. Ethical approval was obtained from the hospital's ethics committee and patient confidentiality was strictly maintained by anonymizing records with unique codes.

Results

During the study period, 525 patients with leprosy were followed at the Dermatology Hospital of Bamako. Among them, 57 cases involved children, representing a frequency of 10.84%. The age group 10-15 years accounted for 61.40% (35) of cases, followed by the 5-9 years group with 28.07% (16) and the 0-4 years group with 10.53% (6). Males represented 66.67% (38) and females 33.33% (19), with a sex ratio of 2.

Regarding geographical origin, 66.67% (38) of patients lived in rural areas, compared to 33.33% (19) in urban areas. Clinically, the Multibacillary (MB) form predominated with 73.68% (42) of cases (Table 1), versus 26.32% (15) for the Paucibacillary (PB) form. The most frequent functional signs were hypoesthesia at 64.91% (37) and paresthesia at 28.07% (16). The types of elementary lesions observed were: hypochromic macules 38.60% (22), Fig. 1,2 papules 24.56% (14), nodules 12.28% (7), diffuse infiltrations 10.53% (6), infiltrated plaques 10.53% (6) and ulcerations/secondary lesions 3.51% (2). Peripheral nerve involvement was dominated by nerve hypertrophy 54.39% (31) and neuropathic pain 19.30% (11). Lepra reactions were present in 22.81% (13) of patients, including 69.23% (9) type 1 reactions and 30.77% (4) type 2 reactions. Bacteriologically, slit-skin smear examination was positive in 73.68% (42) of patients, with a mean bacteriological index of 2.8 (Table 2).

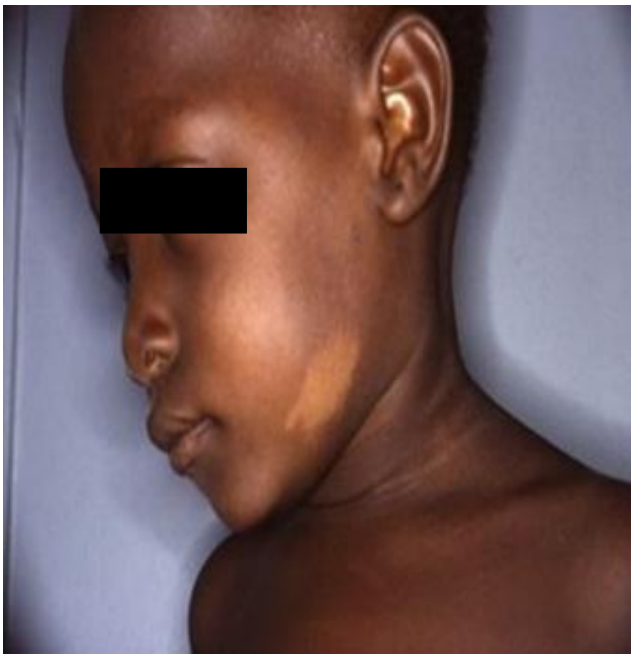

Figure 1: Hypochromic leprous macules in a child.

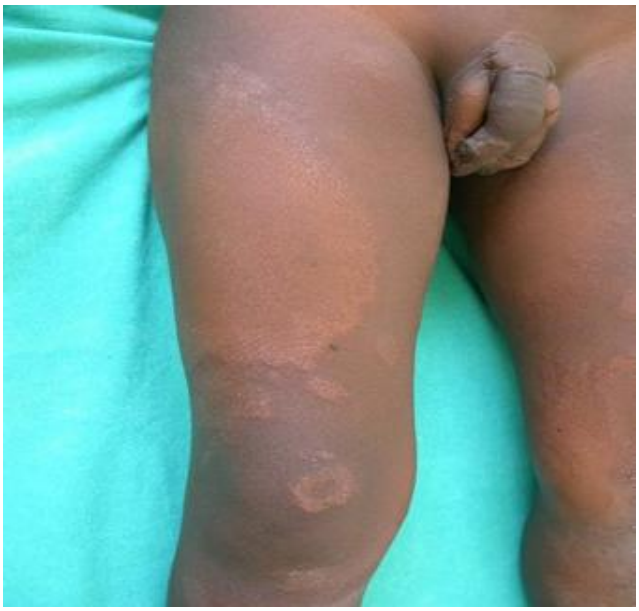

Figure 2: Infiltrated plaques in a child.

Répartition		Classification Clinique OMS		
		PB	MB	Total
Indice bacillaire	**0**	**14**	**4**	**18**
	1+	2	0	2
	2+	0	3	3
	3+	2	0	2
	4+	0	9	9
	5+	0	20	20
	6+	0	3	3
Total		**18**	**39**	**57**

Table 1: Classification clinique et indice bacillaire. Slit-skin smear examination was positive in 73.68%.

Classification Bactériologique		PB	MB	Total
Examen histologique	Lèpre I	2	5	7
	Lèpre TT	3	2	5
	Lèpre BT	1	6	7
	Lèpre BB	4	12	16
	Lèpre BL	6	8	14
	Lèpre LL	2	6	8
Total		**18**	**39**	**57**

Table 2: Classification histologique et Clinique. Multibacillary (MB) form predominated with 73.68%.

Discussion

Leprosy remains a public health problem in many developing countries, particularly in sub-Saharan Africa. In Mali, the current prevalence is estimated at 24.83 cases per 10,000 inhabitants (0.2483%) [1]. In our study conducted at the Dermatology Hospital of Bamako, 525 leprosy cases were managed, of which 10.84% (57) were children aged 0 to 15 years. This proportion reflects ongoing active transmission within the community, confirming previous observations in the region [7]. The frequency of pediatric cases in our study is higher than that reported in Togo (6.4%) by Saka, et al., but lower than that observed in Senegal (61.9%) according to Dioussé, et al. [8,9]. In India, one of the most endemic regions, the proportion of pediatric cases ranges between 22 and 30% according to the National Leprosy Eradication Programme (NLEP), reflecting different epidemiological dynamics linked to socio-environmental factors [10].

The mean age of patients in our cohort was 11.3 years, consistent with studies in India and Senegal [9,11]. This age profile suggests exposure to *Mycobacterium leprae* early in life, with a variable incubation period explaining the delayed onset of symptoms. The male-to-female sex ratio of 1.85 observed in our study is also consistent with the literature, where a male predominance is frequently reported in pediatric leprosy, notably in Senegal (1.43), Togo (1.3) and India (1.73) [8-10]. This sex disparity may be explained by differences in environmental exposure or access to care biases. Clinically, the Multibacillary (MB) form accounted for 68.9% of cases, a higher rate than that observed by Dioussé (58.9%) in Senegal but in contrast with Indian data where the Baucibacillary (PB) form predominates [9-11]. This predominance of MB forms in children may reflect intense transmission and partial immune deficiency in this population, increasing the risk of more severe forms [9].

The high bacteriological index observed (43.8% with BI 5+ and 25.1% with BI 4+) confirms a significant bacillary load, a factor of high contagiousness requiring rapid and complete management. This finding aligns with Belinchón, et al., who highlighted the importance of bacillary load in clinical progression and transmission [10]. Lepra reactions, observed in 16.5% of our patients, are a major concern in pediatrics because they worsen nerve lesions and increase the risk of disability. This rate is similar to that reported by Richardus, et al., who described a reaction incidence of around 15-20% in children [12]. A recent study by Naafs, et al., emphasizes the importance of close neurological monitoring to prevent these complications [13].

Regarding elementary lesions, the predominance of hypochromic macules (38.6%) (Fig. 1,2) and papules (24.56%) aligns with classical descriptions, but the notable presence of nodules (12.28%) and diffuse infiltrations (10.53%) illustrates clinical diversity, particularly in MB forms. These data are comparable to observations by Lockwood, et al., on clinical presentation in children [14]. Finally, peripheral nerve involvement marked by nerve hypertrophy (54.39%) and neuropathic pain (19.3%) underscores the need for early diagnosis. The literature confirms that children are at risk of developing severe neurological complications without adequate treatment [13].

Conclusion

This study confirms the persistence of pediatric leprosy in Mali, with epidemiological and clinical profiles similar to those observed in other endemic countries in Africa and Asia. The high proportion of multibacillary forms and significant bacillary load highlight the urgency to strengthen early screening strategies, specialized management and monitoring of lepra reactions to reduce transmission and sequelae.

Conflicts of Interest

The authors declare no conflict of interest in this paper.

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None

Authors' Contributions

All authors contributed to conceptualization, treatment execution, manuscript writing and final approval.

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