Leprosy in children: Epidemiological, clinical, therapeutic and evolutionary aspects in the Macompo anti-leprosy center, Dubreka health district, Guinea

Abstract

Introduction. Leprosy in children is closely correlated with recent disease and active foci of transmission in the community, particularly in families living in the same household. The objectives of this study were to describe the demographic, clinical, therapeutic and evolutionary epidemiological profiles of leprosy in children aged ≤ 17 years in the Macompo anti-leper center in the Dubreka health district.

Material and Methods. This was a 6 years (January 2011 - December 2016) descriptive retrospective study of the records of child patients followed for the management of leprosy. Included in the study were records of patients aged < 18 years diagnosed with leprosy regardless of sex and origin and who may or may not have benefited from antileprosy chemotherapy.

Results. We collected 39 cases of leprosy out of 114 children identified, i.e. a prevalence of 34.2%. The annual detection rate in children varies ~~in sawtooth~~ ranging from 0.4 cases in 2011 to 0.8 cases in 2016 and has always remained below 1 case/10000 inhabitants. The average age of children was 12 years with extremes of 5 and 17 years .The age group of 12 - 17 years (79.5%) was the most affected. We noted a male predominance (51.3%) with a sex ratio of 1.1. Out-of-school children (53.8%) were the most affected and the majority lived in the urban commune (71.8%). The consultation time varied between 6 and 10 months (61.5%). No child had a history of leprosy. Clinically the lesions were present in the form of macules (100%) plaques (56.4%) and infiltrations (23.1%). The type 2 leprosy reaction (61.5%) was the most common with 61.5% of degree 2 disability. Neurological signs were dominated by neuritis (17.9%) and nerve hypertrophy (5.1%). Multibacillary leprosy (61.5%) was the most observed. All children (100%) were on PCT for 12 months after which 98.9% of the children were cured.

Conclusion. The high proportion of children with leprosy and the predominance of multibacillary forms are factors in the spread of the disease.

Keywords: Leprosy, Child, Dubréka, Guinea

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Introduction.

Leprosy is an infectious disease caused by *Mycobacterium leprae* preferentially affecting the skin and certain peripheral nerves. The symptomatology is highly polymorphic and largely conditioned by the response modalities of the immune system~~1~~ [1]. In children, leprosy is closely correlated with recent disease and active foci of transmission in the community, particularly in families living in the same household [2]. The decisive therapeutic advances of the 1980s led the WHO in 1991 to make the elimination of leprosy one of its major objectives by the end of 2000 [3]. This goal was achieved in 2001 and in ~~total more~~total more than 13 million patients have been cured with polychemotherapy. However, the outlook is less encouraging if we look at the number of new cases since during the same period the annual detection rate of new cases remained constant and there were still more than 200,000 in 2011[4]. In South America [5], the proportion of children among new cases of leprosy varies from 0.86% in Argentina to 16.67% in the Dominican Republic.

In Senegal [6] in 2017, in a retrospective cohort of 63 leprosy children enumerated in the Thiès region, 61.9% were children under 15 years of age. In Guinea [7] in 2013 the prevalence of affected children among new cases of leprosy was 0.24% in the care sites of the city of Conakry.

The objectives of this study were to determine the prevalence of leprosy in children, to describe the sociodemographic profile of the patients, the clinical characteristics and the therapeutic and evolutionary modalities.

Material and methods.

This was a 6 years (from January 2011 to December 2016) descriptive retrospective study of the files of children followed for leprosy care at the Macompo anti-leprosy center. This center also provides care for Tuberculosis, Trypanosomiasis and Onchocerciasis. Its coverage population is estimated at 223774 inhabitants divided between the urban commune and the six sub-prefectures (Tondon, Khorira, Faléssadé, Wassou, Bady and Tanènè). Included in this study were all records of patients aged < 18 years diagnosed with leprosy regardless of sex and origin and who may or may not have benefited from antileprosy chemotherapy. Data collection was based on a pre-established survey sheet. The variables studied were epidemiological data (prevalence, detection rate), demographic data (age, sex, geographical origin, grade level), clinical data (consultation time, history of leprosy, type of lesions, leprosy disability, form of leprosy, type of leprosy reaction, neurological signs), Treatment modalities recommended by WHO in endemic areas were: Multibacillary leprosy: rifampicin (RMP): 10 mg/kg/month, supervised (Children under 10 years: 300 mg; 10 to 14 years: 450

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mg); diaminophenyl sulfone (DDS): 1.5 mg/kg/d (Children under 10 years: 25 mg; 10 to 14 years: 50 mg); clofazimine (CLO): 1 mg/kg/day (Children under 10 years of age: 50 mg 2 times a week; 10 to 14 years: 50 mg every 2 days) and supervised 3 mg/kg/month (Children under 10 years of age: 100 mg, 10 to 14 years of age: 150 mg). Duration of treatment: 12 months. Paucibacillary leprosy: Rifampicin: 10 mg/kg/month, supervised; DDS: 1.5 mg/kg/day. Duration of treatment: 6 months. Follow-up procedures: WHO recommends accompanied PCT (PCT-A) based on the delivery, as soon as the diagnosis is made, of all PCT platelets (6 to 12 months depending on the form of leprosy) after ensuring that the patient is accompanied by a member of his family or entourage is realized. Cure criteria: Clinical criteria with clear regression of skin lesions during treatment. Evolution: mutilations, healing, lost sight.

Results.

We collected 39 cases of leprosy out of 114 children identified, ~~i.e.~~i.e., a prevalence of 34.2%. The annual detection rate in children varies ~~in sawtooth~~ ranging from 0.4 cases in 2011 to 0.6 cases in 2016 and this rate has always remained below 1 case/10000 inhabitants. The average age of the children was 12 with extremes of 5 and 17 years. The 12-17 age group (79.5%) was the most affected followed by the 6-11 age group (20.5%). We noted a male predominance (51.3%) with a sex ratio of ~~1.1~~1:1. Out-of-school children (53.8%) were the most affected and the majority lived in the urban commune (71.8%). The **Table I** ~~summarises~~summarizes the patients sociodemographic characteristics. The consultation time varied between 6 and 10 months (61.5%). No child had a history of leprosy. Clinically the lesions were present as macules (100%), plaques (56.4%) and infiltrations (23.1%). The type 2 leprosy reaction 8(20.5%) cases was the most common followed by the type 1 reaction 4(10.2%) cases. Disabilities were dominated by degree 2 disability 24(61.5%) cases. Neurological signs were dominated by neuritis (18.0%) and nerve hypertrophy (5.1%). Multibacillary leprosy 24 cases (61.5%) was the most observed followed by paucibacillary leprosy 15 cases (38.5%). The **Table II** ~~summarises~~summarizes the patients clinical characteristics. All children (100%) were on PCT for 12 months for multibacillary and 6 months for paucibacillary at the end of which 94.9% of children were cured and 2 (5.2%) lost to follow-up.

Discussion.

We conducted a retrospective descriptive study from the records of children sick with leprosy in the Macompo anti-leprosy center. One of the limitations of this study was the retrospective nature and the fact that the diagnosis of leprosy was based solely on a clinical presumption. The results obtained cannot be exhaustive, as the study only took into account the cases of

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leprosy recorded in the center alone. They cannot therefore represent all children sick with leprosy in Guinea, but nevertheless give an idea of the current profile, and also testify to the persistence of the factors of contagiousness and spread of the disease. Epidemiologically, leprosy is no longer a priority public health problem in Guinea since 2010, as the detection rate of new cases is still below 1 case/10000hbts [8]. However, the prevalence of 34% in children is an indicator of the persistence of the factors of spread of the disease in the general population. Does the decrease in the detection rate between 2011 and 2016 in our series signal victory against the disease, or a decrease in leprosy detection activities? According to WHO criteria, leprosy has been eliminated from Guinea since 2010. However Phaff and al [9] in Mozambique found three times in a row that detection was higher during years of "Elimination Campaigns" than during years of conventional screening. The average age of children was 12 years with extremes of 5 and 17 years. The age group of 12-17 years (79.5%) was the most affected followed by the 6-11 range (20.5%). Chaitra P et al [10] in 2013 in India reported a proportion of 75% in children aged 11-14 years. The male predominance found in our study is also reported by several authors [11, 12]. The difference would therefore result from a higher incidence of leprosy in the male sex and not from a difference in the duration of the disease. Most of our patients resided in urban areas. The geographical proximity of the parents to the site of treatment explains this fact. Clinically, the skin symptomatology was dominated by the macules that were present in all patients followed by plaques and infiltrations. Barreto JG et al [13] in Brazil in 2015 found a high frequency of homochromic macules in their patients. The consultation period was late in 21% of cases and ranged from 11 to 20 months. This could be explained by the fact of the long incubation period. Indeed, the symptoms of leprosy usually begin only one year after infection (on average between 5 and 7 years). Once symptoms begin, they progress slowly. The measurement of the degree of disability is an indicator that makes it possible to estimate the early detection of leprosy in a community. In our study, degree 2 disability accounted for 61.5%. This indicates a late detection of cases of leprosy. The course of leprosy is often punctuated by complications called leprosy reactions related to the modulation of the immune system. In our study, both types of leprosy reaction were observed with a predominance of type 2 reaction related to the importance of multibacillary forms. This result is identical to that of Keita M et al [7] who also reported a predominance of the type 2 reaction. However Scollard DM et al [14] in Brazil in 2015 reported a predominance of the type I reaction. The predominance of multibacillary leprosy observed in our study is also observed in most studies in the West African subregion [6, 11, 12, 14, 15]. In recent years the use of antileprosy

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polychemotherapy has significantly reduced the number of cases worldwide. In our study 61.5% of children were on multibacillary polychemotherapy versus 38.5% paucibacillary polychemotherapy with a coverage rate of 100% and a cure rate of 94.9%. No cases of relapse have been reported. However 2 cases of lost sight were observed.

Conclusion.

The high proportion of children affected by leprosy and the predominance of multibacillary forms are factors in the spread of the disease. In our context, efforts should be continued to reduce the prevalence of leprosy among children to make leprosy elimination a reality in our country.

ADD ACKNOWLEDGEMENTS, CONFLICT OF INTEREST.

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Table I : Sociodemographic characteristics of the 39 chidren affected by leprosy

Sociodemographic characteristics	**(N = 39)**	**n (%)**
Age groups (years)		
0-5		00
6-11		8 (20.5)
12-17		31(79.5)
Mean age: 12 years	Extremes : 5-17 years	
Sex		
Male		20 (51.3)
Female		19 (48.7)
Level of education		
Children in school		18 (46.2)
Children out of school		21 (53.8)
Residency		
Urban		28 (71.8)
Rural		11 (28.2)

Table II : Clinical characteristics of the 39 chidren affected by leprosy

Clinical characteristics	(N = 39)	n (%)
Consultation time (mounths)		
0-5		8(20.5)
6-10		24(61.5)
11-20		7(18.0)
Type of lesions		
Macules		39(100)
Plaques		22(56.4)
Infiltrations		9(23.1)
Nodules		3(7.7)
Neurologic signs		
Nevritis		7(18.0)
Nerve hypertrophy		2(5.1)
Leprosy reactions		
Type I		4(10.2)
Type II		8(20.5)
Degree of disability		
Degree 0		9(23.1)
Degree 1		6(15.4)
Degree 2		24(61.5)
Forms of leprosy		
Paucibacillary		15(38.5)
Multibacillary		24(61.5)