

Epidemiology of the New Cases of Leprosy at the Raoul Follereau Institute of Cote D'ivoire (Adzope) from 2014 to 2018

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ABSTRACT

Objective: To describe the epidemiological aspects of new leprosy cases observed at IRFCI from 2014 to 2018.

Materials and methods: This is a retrospective study of new cases of leprosy confirmed by biopsy and/or bacteriological examination from January 2014 to December 2018. The analysis of data such as sex, age and degree of disability as well as the bacteriological index was performed at IRFCI.

Results: 217 new cases of leprosy were diagnosed at the Raoul Follereau Institute of Ivory Coast (IRFCI). The average detection rate was 0.84 during the study period. The sex ratio was 1.03 with 49.3% female and 50.7% male. The rate of new cases of pediatric leprosy was 13.4% compared to 86.6% for those over 15 years old. Pauci-Bacillary (PB) forms were 33.6% versus 66.4% Multi-Bacillary (MB) forms. Out of the 217 new cases of leprosy, 42% had a disability of which 2.8% of degree 1 (ID1) and 39.2% of degree 2 (ID2). PB forms accounted for 58.9% of women, 90.4% of subjects over 15 years of age and 37% of ID2. MB forms accounted for 55.5% of men, 84.7% of subjects over 15 years of age and 40.3% had ID2.

Conclusion: The important presence of multibacillary forms and the detection of pediatric leprosy cases indicate a continuous spread of the disease. The present results impose an intensification of the fight against leprosy in Côte d'Ivoire with the establishment of a system for controlling, monitoring and alerting.

Keywords: Leprosy, Multi-bacillary, Pauci-bacillary, IRFCI

INTRODUCTION

The leprosy or Hansen's disease is an infectious, chronic non-immunizing disease due to *Mycobacterium leprae*. It is transmitted by airway (droplets of epflüemg) or by nasals secretions during physical and frequent contacts with an infected and untreated subject. It is a disease that attacks preferentially the skin and the peripheral nervous system. According to WHO, leprosy is one of 17 neglected tropical diseases (NTDs) [1,2]. Despite the existence of effective treatment, thousands of new cases are identified each year.

The leprosy bacillus was discovered in 1873 by the Norwegian Gerhard Armauer Hansen and subsequently with improving of health and life conditions, it has been eradicated from some industrialized countries. However, it remains a public health problem for many countries in Africa, Asia and Latin America despite the efforts of the international community. Indeed, the introduction of the polychimiothérapie (PCT) in 1981 by WHO has allowed a dramatic decline of the disease. This hope motivated WHO in 1991 to make the wish (from 1991 to 2000) to eliminate

leprosy from the list of diseases considered a public health problem by reducing the prevalence rate of patients treated with multidrug therapy (PCT) less than one case per 10,000 inhabitants [3,4]. An ambitious goal that has been achieved in most countries of the world. However, according to the WHO in 2008, some countries such as Brazil (2.39/10.000), Liberia (1.78/10.000), Nepal (1.18/10.000), Timor (1.13/10.000) and the Democratic Republic of Congo, whose prevalence is around 1/10,000, have not yet reached this goal [5,6]. It should also be noted that Africa is still an endemic

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continent with 9 out of the 17 countries in the world still suffering from the disease, accounting for more than 95% of new cases of leprosy in 2010 [7-9].

In Côte d'Ivoire, the prevalence rate in 2017 was 0.34/10,000 inhabitants. The Raoul Follereau Institute of Côte d'Ivoire (IRFCI) is the national reference center for the management of leprosy complications. He also receives and processes new cases. As such, he has been receiving for many decades many patients at different stages of the disease.

We propose to make the leprosy situation at IRFCI from 2014 to 2018 because no published study has been done to this effect.

MATERIALS AND METHODS

This is a retrospective study of new cases of leprosy confirmed by biopsy and/or bacteriological examination from 2014 to 2018.

The collection of data such as sex, age and degree of disability was recorded during the patient consultation.

The bacteriological index was carried out in the IRFCI laboratory from a smear test to determine the bacteriological status of the patients either paucibacillary (absence of bacilli on the smear) or multibacillary (presence of bacilli on the smear).

RESULTS

From January 2014 to December 2018, 217 new cases of leprosy were diagnosed only at the Raoul Follereau Institute of Côte d'Ivoire (IRFCI).

The peak of detection of new cases of leprosy in 57 cases was observed during 2015. The lowest number of cases (27) was observed during the year 2018 (**Figure 1**). It was recorded a detection rate in 2014 and 2015 of 1.1 while in 2018, it was 0.5 (**Figure 1**).

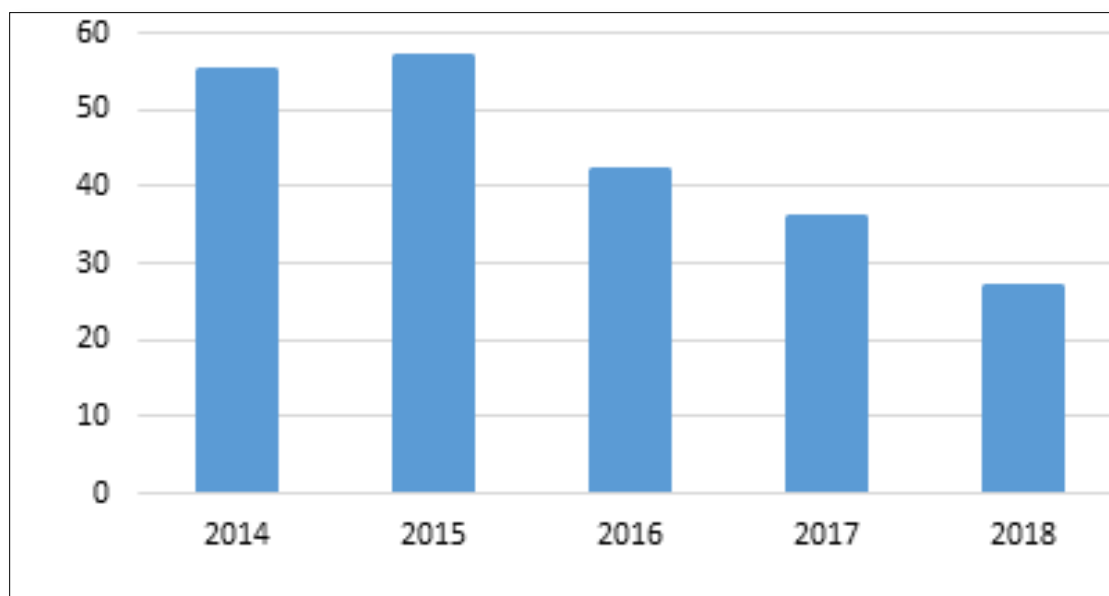


Figure 1. New cases of leprosy detected á the IRFCI, annual detection rate from 2014 to 2018.

Of the 217 new cases, 107 (49.3%) were female and 110 (50.7%) were male (**Table 1**); a sex ratio (male/female) of 1.03.

The proportion of patients under 15 was 13.4% (29 cases) and those aged 15 or older were 86.6% (188 cases) (**Table 1**).

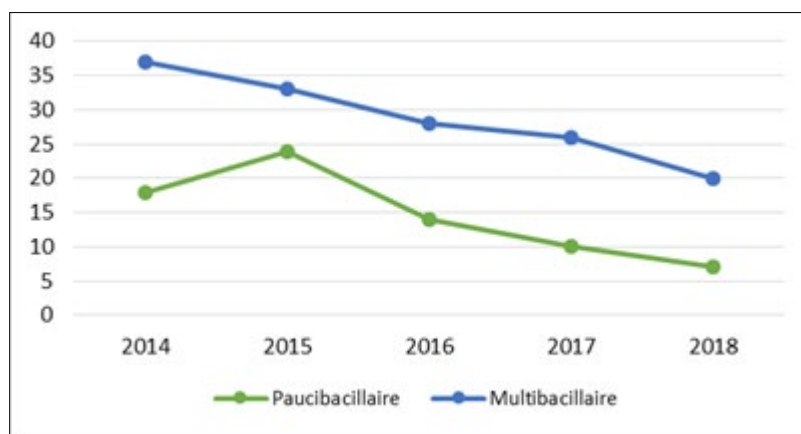
Table 1. Main features of new cases of leprosy from 2014 to 2018.

	2014		2015		2016		2017		2018		Together	
	NOT	%	NOT	%	NOT	%	NOT	%	NOT	%	NOT	%
Sex												
Male	24	43.6%	32	56.1%	22	52.4%	16	44.4%	16	59.3%	110	50.7%
Female	31	56.4%	25	43.9%	20	47.6%	20	55.6%	11	40.7%	107	49.3%
Age range												
<15 years	19	34.5%	4	7.0%	4	9.5%	1	2.8%	1	3.7%	29	13.4%
≥ 15 years	36	65.5%	53	93.0%	38	90.5%	35	97.2%	26	96.3%	188	86.6%
Degréd'invalidité												
0	27	49.1%	31	54.4%	26	61.9%	25	69.4%	17	63.0%	126	58%
1	2	3.6%	1	1.8%	0	0.0%	2	5.6%	1	3.7%	6	2.8%
2	26	47.3%	25	43.9%	16	38.1%	9	25.0%	9	33.3%	85	39.2%
Shape bacillary												
PB	18	32.7%	24	42.1%	14	33.3%	10	27.8%	7	25.9%	73	33.6%
MB	37	67.3%	33	57.9%	28	66.7%	26	72.2%	20	74.1%	144	66.4%

Of the total number of new cases, 73 (33.6%) were paucibacillary and 144 (66.4%) multibacillary.

Of the 73 new paucibacillary cases, 30 (41.1%) were male and 43 (58.9%) were female. While in the multibacillary forms of the 144 new cases, 80 cases were male or 55.5% against 64 female cases or 44.5%.

The distribution of bacillary forms per year has led to a peak in 2014 and a decrease from 2015 to 2018 for multibacillaries. As for the paucibacillaries after obtaining a peak in 2015, it was observed a decrease from 2016 to 2018 (**Figure 2**).

**Figure 2.** Evolution of new MB and PB leprosy cases detected at IRFCI from 2014 to 2018.

The analysis by age group revealed that paucibacillary forms, or 9.6% (07 new cases), were observed in pediatric subjects compared with 90.4% (66 new cases) in subjects aged 15 years and over.

For multibacillary forms, the age group study found that 15.3% (22 cases) were pediatric subjects compared to 84.7% (122 cases) subjects aged 15 years and over.

The proportion of disabilities among new cases was 91 out of 217 or 42% of cases. A proportion that varies according to the years. The degree of disability of level 1 was of 2, 8% is 6 cases. The degree of disability of level 2 was 39.2% is 85 cases (**Table 1**) with a significant rate (47.3%) in 2014. The degree of disability at level 0 was 58% or 126 cases (**Table 1**). The analysis of the degree of disability according to the bacillary forms made it possible to observe that for the paucibacillary forms the ID0 was 60, 3% against 37% of ID2 and 2.7% of ID1. For multibacillary forms, it was noted 56.9% of ID0 against 40.3% of ID2 and 2.8% of ID1.

DISCUSSION

The introduction of multidrug therapy (MDT) in 1981 by WHO [10,11] in the treatment of leprosy has shown a significant decline in this disease in many parts of the world. Any patient who has taken his treatment regularly and for the required time is assured of healing in more than 95% of cases, because relapses and resistance are rare [12]. This has helped to reduce the global burden of leprosy.

Côte d'Ivoire, for its part, noted satisfactory results with a prevalence rate of 0.34/10,000 inhabitants in 2016. This represents a significant decrease in the circulation of *Mycobacterium leprae* responsible for leprosy. However, leprosy persists and its dissemination continues. The IRFCI, which is one of the important sites for the treatment of leprosy in Côte d'Ivoire, recorded 217 new cases of leprosy from 2014 to 2018, making 5.6% (217/3865) compared to the national plan. The 3865 cases constitute the new cases of leprosy obtained during the period of 2014 to 2017 at the national level with an average prevalence rate of 0.33/10,000 inhabitants. A national prevalence that meets the WHO statistical objective (prevalence <1/10,000 inhabitants) of which the goal is to eliminate leprosy. The prevalence in Côte d'Ivoire is below that of Mayotte, which had a rate of 3.70/10,000 inhabitants in 2011 [13].

Our study appears to be similar to that of WHO in 2014, when 9% of new cases of leprosy were recorded in Africa, 2% in the Eastern Mediterranean, 2% in the Western Pacific, compared to 71% in south-east Asia and 16% in America [9,14,15].

The analysis of new cases of leprosy by sex during the period of this study indicates a proportion of female cases of 49.3% against 50.7% of male cases or a sex ratio of 1.03. This indicates a good involvement of women in the detection and management of the disease. The proportion of female cases (49.3%) is close to that obtained in 2015 at the national level, which was 39.7% (354/891) of female cases [14-16]. The participation rate of women in screening is becoming increasingly important in some countries, such as Burkina Faso (49.2%), Senegal (25.0%), Cuba (48.8%) and Sri Lanka (49.9%) [17]. These rates show a good representation of women. This implies the gradual end and

absence of discrimination against women with leprosy. These different rates show that African countries have understood the need not to exclude women from the 2016-2020 goal of achieving a world without leprosy. At the IRFCI, as everywhere else in Côte d'Ivoire, it must be remembered that access to health care does not take into account the sex of the patients.

The detection rate of new cases of leprosy appears to be significant in subjects over 15 years of age compared to those under 15 years of age. The proportion of new pediatric cases (13.4%, 29/217) in this study is roughly comparable to that obtained nationally (8.9%, 79/891) and elsewhere, such as in Somalia (8.4%). at the global level (8.9%) [17]. On the other hand, this proportion is low compared to Comoros (38.1%) and Papua New Guinea (30.4%) [17]. Screening for pediatric leprosy is very important as it provides information on the level of continuous transmission and recent contamination of the disease. According to the results of our study, this indicator of the insidious spread of leprosy illustrates the possibility of transmission of infection within the Ivorian population. As children are an active, naïve and vulnerable population, it is therefore necessary to raise awareness and educate them from an early age in order to reach the goal of zero pediatric leprosy.

The proportion of new cases of multibacillary leprosy in our study which was 66.4% (144/217) is similar to the 70% (626/891) obtained in 2015 at the national level. A proportion that remains important in both situations. Some authors, such as De Carsalade in 2006, have shown that the increase of multibacillary forms could constitute a risk of transmission of leprosy [18,19]. On this basis, we can assume that the high rate of multibacillary forms in Côte d'Ivoire highlights a significant circulation of leprosy among the Ivorian population. The rate of 70% at the national level is roughly comparable to that of some countries such as Senegal (94.8%), Comoros (47.5%), Egypt (91.1%) and Indonesia (84.6%) [9]. The multibacillary form being the most contagious, its increase could perpetuate the infection and lead to a major handicap. According to some authors, a multibacillary form multiplies by 5.7 the risk of progressing to a level 2 disability [20,21]. The significant presence of multibacillary forms in some African countries leads us to believe that certain regions of Africa continue to remain endemic areas and dormant leprosy foci. It is therefore important for Côte d'Ivoire to reach an early detection of leprosy in order to reduce multibacillary forms and, moreover, to permanently eliminate level 2 disabilities.

The analysis of the new cases of leprosy related to the infirmity made it possible to note the absence of sequelae in 58.1% of the cases against 39.2% of infirmity of degree 2 (ID2). This proportion of ID2 is still high and close to that observed at the national level, which was 20.88% (186/891) in 2015 [17]. Also, it is important to note that this rate is similar to that of Burkina Faso (31.2%) and Somalia

(42.1%). Level 2 disability seems to be increasing in some parts of the world, such as South East Asia, where the number of new ID2 cases has increased from 5791 in 2005 to 8572 in 2015. The occurrence of a disability Grade 2 (ID2) in new cases of leprosy is a reflection of late detection of the disease. Thus, the finding of the high level of ID2 indicates that awareness and detection of leprosy in Côte d'Ivoire and elsewhere in Africa are still late. A situation that shows the need to strengthen awareness and early diagnosis methods

CONCLUSION

At the end of our study conducted at the IRFCI in Adzopé during the last five years, we can say that the leprosy situation remains worrying. The high level of multibacillary forms suggests continuing PCT leprosy and increasing surveillance at the national level to permanently eliminate this infection. Awareness needs to be created and raised not only for health staff and practitioners but also for the population in order to achieve early detection of the disease and the elimination of pediatric leprosy cases. It would also be necessary to push the reflection by the installation of a system for controlling, monitoring and warning of leprosy.

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