Original Research Article

Epidemiological and Clinical Profile of Leprosy in Zinder

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Abstract: *Introduction:* Leprosy is an endemic chronic bacterial infection caused by Hansen's bacillus (HB) and favorised by promiscuity and precariousness. The objective of this study is to describe the epidemiological profile of leprosy in Zinder. *Patients and method:* this was a descriptive and analytical study on an exhaustive sample including patients treated with leprosy in Zinder-town from 2016 to 2020. Epidemiological data were collected through leprosy media. *Results:* a total of 129 cases were collected on 16686 consultations, i.e. a frequence of 0,8 per 100. The patients' mean age was 37.07 ± 15.51 years, with extremes of 8 and 87 years. Patients in the 24 to 35 years old group were predominant with a rate of 25.60%. The sex ratio (M/F) was 1.11. Housewives and farmers were the majority accounting for 43% and 32.8% of the cases respectively. The majority of patients (74.2%) live outside the city of Zinder and 62.79% of them live more than 9.3 miles away from their care centers. Bascilloscopy performed in 65.11% of new cases and was positive in 60.46% of patients. The multibacillary forms represented 94.6% and the new cases with a second-degree disability represented 37.98% of the sample. *Conclusion:* Leprosy is common in Zinder with a predominance of the multibacillary form. Patients with second-degree disability accounted for 37.98%. This requires a large-scale intensification and extension of the implementation of leprosy control strategies in Zinder.
Keywords: Leprosy, multibacillary, infirmity, Zinder.

INTRODUCTION

Leprosy is a chronic infection conventionally caused by an acid-alcohol-resistant bacillus, Hansen's bacillus (BH) or Mycobacterium leprae (M. leprae) [1]. This bacillus preferentially reaches the skin, mucous membranes, peripheral nervous system, eyes and depending on the cellular immunity of the infected subject, realizes different clinical forms [2].

Among these forms, we note tuberculoid leprosy, Tuberculoid Borderline, Borderline Borderline, Lepromatous Borderline and lepromatous leprosy of the Ridley Joplin classification [1] abandoned in favor of the WHO operational classification which determines 2 types of leprosy: the pauci-bacillary form PB and the multi-bacillary form MB this facilitating the management of the disease. In the absence of treatment, leprosy can progress and cause permanent damage to the skin, nerves, limbs and eyes [3].

In 2005, the WHO declared that leprosy was eliminated as a public health problem in the world with less than 1 case per 10,000 inhabitants. While the number of new cases detected had decreased in 2020 (127,396 cases) compared to previous years (202,185 cases in 2019), it rose to 140,594 cases in 2021 and to 174,087 in 2022 [2].

To date, the incidence remains stable worldwide, with about 200,000 new patients per year [3,4,5].

Africa recorded 16,690 new cases in 2020, with a prevalence rate of 13.3 per million inhabitants and the seven most affected countries were: Nigeria, Ethiopia, Mozambique, the Democratic Republic of Congo (DRC), Tanzania, Somalia and Madagascar [6]. In Niger, although leprosy has been eliminated as a public health problem since 2002, of the 293 cases, 277 are new cases detected in 2020, i.e. a detection rate of 1.19 cases per 100,000 BST. The Zinder region is the most affected

with 72 new cases, more than a third of which were detected at the Kara-Kara integrated health center and at the Zinder National Hospital (HNZ) according to the national leprosy control program (PNLL). However, despite its low prevalence at the national level, the high detection remains relevant in certain regions such as Zinder which has the highest rate (26%) of BH contamination. However, there are not enough studies devoted specifically to the epidemiology of leprosy in the locality. That is why we decided to study the epidemiological profile of leprosy at the integrated health center (CSI) of Kara-Kara and at the Dermatology department of the HNZ from January 1, 2016 to December 31, 2020 in order to properly plan and execute the various control strategies for the elimination of leprosy.

PATIENTS AND METHOD

This is a descriptive study with retrospective collection focused on the analysis of the data collection media of patients treated for leprosy at the CSI of Kara-kara and at the dermatology department of the HNZ during the study period. This is an exhaustive sample. A data collection sheet was drawn up beforehand containing socio-demographic (age, sex, origin) and clinical information (diagnostic basis, WHO classification of leprosy, degree of infirmity, complications) and a number guaranteeing anonymity is assigned to each sheet. The bed base, the treatment book and the clinical sheets completely filled in served us as a source of data collection from October 15, 2021 to November 05, 2021, for 21 days. The quantitative variables were presented in the form of means with standard deviation and extreme values. The qualitative variables were presented in the form of proportions. The Statistical Test used is that is Chi2 or X2 (significance value of 5%). The Excel and Epi-info software version 3.5.4 were used for data processing.

RESULTS

A total of 129 cases (63 cases at the Kara-kara CSI and 66 cases at the HNZ Dermatology department) were treated from 2016 to 2020, i.e. a frequence of 0,8 per 100. The average age of the patients was 37.07 ± 15.51 years, with extremes of 8 and 87 years. The 25-34 age group predominated with 25.60% followed by the 15-24 age group (23.30%) (Figure 1). A male predominance was observed (Table I) with an M/F sex ratio of 1.11. Housewives and farmers were the most represented, respectively in 43% and 32.8% of cases. 74.2% of the patients who received anti-leprosy treatment lived in areas outside the city of Zinder. The majority of patients (62.79%) resided in an area more than 15 km away from the care centers (Table II). Among the 62 patient residences located outside the city of Zinder, Tirmini and Rouwan chabara were the most affected by leprosy with 5.21% each. In the city of Zinder, cases from the two districts BIRNI and N'WALA were the most affected with 18.18% of cases each. 39.80% of the patients came from the villages attached to the Mirriah Health District and 31.30% from the Zinder City District, of which 3 cases came from other regions (Maradi 1 case, Agadez 1 case and Daoura in Nigeria 1 case). Most patients (96.90%) treated for leprosy were new cases. As for the clinical characteristics (Table III), the diagnosis was bacteriological in 60.46% of the cases, the multi-bacillary form represented 94.6% of the cases, 37.98% of new cases had second-degree disability at the time of diagnosis against 55.20% without infirmity. No significant correlation between the degree of infirmity and the forms of leprosy diagnosed in the treated patients was found ($X^2 = 2.80$ and $p = .54$ for MB and PB =0.280). Only 24.81% of the patients had type 1 reactions.
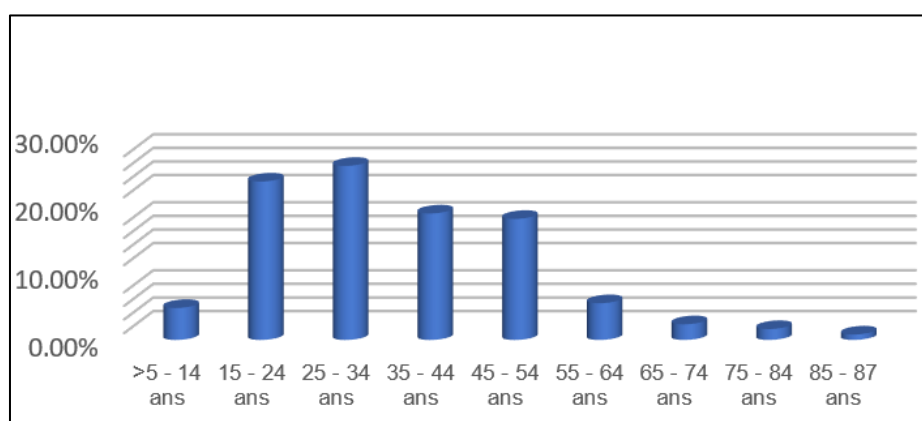

Figure 1: Distribution of the 129 surveyed patients in the two centers by age groups

Table I: Distribution of the 129 patients surveyed in the two centers according to gender

Sex	Kara-kara	HNZ	Total
Female	31(49.2%)	30(45.5%)	61(47.3%)
Male	32(50.8%)	36(54.5%)	68(52.7%)

Table II: Distribution of patients by distance between their residence and their care centers (n=126)

Distance	Kara-kara	HNZ	Total
0 to 3.10 miles	17 (27,9 %)	15 (23,1 %)	32 (25,4 %)
3.72 to 9.3 miles	6 (9,8 %)	7 (10,8 %)	13 (10,3 %)
Over 9.3 miles	38 (62,3 %)	43 (66,2 %)	81 (64,3 %)

Table III: Distribution of the 129 patients by clinical characteristics

Clinical and paraclinical Characteristics	Number (*n*)	Percentage (%)
Bascillos copy		
Negative	6	4.65
Positive	78	60.46
Not done	45	34.89
Degree of disability		
Degree 0	71	55.04
Degree 1	9	6.98
Degree 2	49	37.98
WHO Classification		
MB	122	94.60
PB	7	5.40
Complications		
Claw	18	14.50
Steppage	9	7.00
Poorly perforating plantar	21	16.40
Lagophthalmia	12	9,30

DISCUSSION

The results for the epidemic aspects of patients treated for leprosy in the Zinder region show that the most affected age group was [25-34 years old] or 25.6%. It is revealed from our analysis that leprosy also affects children under the age of 15 with 4.7% of the cases. This affected population is an indirect indicator of active transmission of leprosy in Zinder. The new strategies must focus on early detection and examination of contact subject in order to break the chain of contamination and avoid the occurrence of complications that are sometimes irreversible. In a similar study carried out by Biya in 2017 in the DRC [7], children accounted for 14.9% of the cases. It is worth noting that the DRC is one of the 6 countries with a high leprosy morbidity rate in Africa, the affected population was overwhelmingly young. Tetchi [8] in Côte d'Ivoire reports that children under the age of 15 accounted for 16% of the cases. Carter [9] also reports a significant correlation between age and the occurrence of leprosy because young people face an increased risk of infection at home. in addition, Maymone [5] reports that the age between 5 and 15 years and >30 years at the time of exposure is a risk factor. In our study, men predominate (52.7%), with a male/female ratio of 1.11. Poverty, having more psychological repercussions in men than in women, may explain the male predominance of the disease. Similar results were reported globally in 2020 [6]. In our cohort, housewives and farmers were the most represented; respectively in 43 and 32.8% of the cases. These results were similar to those of Ouboué in Côte d'Ivoire, 38% and 35% [10]. 62.79% of the patients lived more than 9.3 miles away from the care centers. This long distance in a poor community can have repercussions on diagnosis and treatment adherence. Tetchi [8] in Côte d'Ivoire reported that 72% of the patients lived in rural areas. Promiscuity and precariousness could probably favor the outbreak of leprosy in rural areas. The shortage of trained workers on leprosy in peripheral health facilities and the social stigmatization would force patients residing in rural areas to consult far from their residence. Almost all of the patients (96.9%) were new cases (NC) at admission. 94.6% of cases were multi-bacillary forms. These would explain the active transmission of leprosy and the delay in diagnosis reflecting a lack of awareness of the population. Our results were superior to those of Beltrame in Italy (65.5%) [11], Ouboué in Côte d'Ivoire (73%) [10] and Biya in the DRC (81.5%) [7] and Tetchi [8] in Côte d'Ivoire (82%). The multibacillary forms are linked to an immunodepression which can be multifactorial. The ID2 was of the order of 37.6% among the new cases. Plantar perforating ailments accounted for 35% of degree 2 infirmities. Our results are superior to those of Tetchi [8] in Côte d'Ivoire who observed in their study 24% of degree 2 disabilities. These degree 2 infirmities remain important because their rate must be less than 2.5 per million inhabitants for the WHO Africa zone. This second-degree disability rate could be explained by a delay in diagnosis, the multifaceted causes of which would be linked either to the limit of strategies to fight leprosy or to the lack of awareness thus perpetuating stigma; or insufficient recognition of the signs of leprosy diagnosis by health workers or barriers related to beliefs. Early detection and treatment at the first manifestations would help to significantly reduce the number of cases with infirmity and limit the risk of

transmission in our study, type I and II reactions were found respectively in 24.81% and 6.98% of cases. This rate was higher than that of Um Boock in the Central African Republic [12] who reported only 1 case of type II reaction out of 57 cases of leprosy detected. This difference could be explained by the young age of the population in our study.

CONCLUSION

This study shows that the transmission of leprosy is persistent in Zinder. Children and young adults are the most affected with especially the multibacillary form and second-degree disability. This requires a large-scale intensification and extension of the implementation of leprosy control strategies in Zinder.

REFERENCES

1. Saurat, J. H., Lachapelle, J. M., Lipsker, D., & Thomas, L. (2004). *Dermatologie et infections sexuellement transmissibles*. Paris: Elsevier Masson.
2. Aubry, P., Gaüzère, B.A. (2024). Lèpre ou maladie de Hansen Actualités 2024 Centre René Labusquière, Institut de Médecine Tropicale, Université de Bordeaux, 33076 Bordeaux (France) www.medecinetropicale.com. Mise à jour le 07/05/2024
3. Alemu Belachew, W., & Naafs, B. (2019). Position statement: LEPROSY: Diagnosis, treatment and follow-up. *Journal of the European Academy of Dermatology and Venereology*, *33*(7), 1205-1213.
4. Nausch, N., & Jacobsen, M. (2019). Identification and validation of host biomarkers for leprosy: A step forward to establish point-of-care tests. *EBioMedicine*, *48*, 9-10. https://doi.org/10.1016/j.ebiom.2019.09.028;
5. Maymone, M. B., Laughter, M., Venkatesh, S., Dacso, M. M., Rao, P. N., Stryjewska, B. M., ... & Dunnick, C. A. (2020). Leprosy: clinical aspects and diagnostic techniques. *Journal of the American Academy of Dermatology*, *83*(1), 1-14. https://doi.org/10.1016/j.jaad.2019.12.080;
6. Organisation Mondiale de la Santé. Relevé épidémiologique hebdomadaire, n°36, 2020, 95, 417-440. Consulté le 25 juillet 2021 sur http://www.who.int/wer;
7. Biya, Nkizinkiko, R. & Mashako, Ruhanga. M. (2019). Profil épidémiologique de la lèpre dans l'Est de la République Démocratique de Congo. *Rev.Hig. Inst.Med. Techn-Goma* Juin 2019, *1*(1), 4-11.
8. sot TETCHI, E. O., KONAN, Y. E., KPEBO, D., DJOMAN, M. C., EKOU, F. K., SABLE, P. S., ... & Odile, T. A. (2023). Épidémiologie de la lèpre dans le district sanitaire de Daoukro (Côte d'Ivoire) de 1999 à 2017. *Médecine Tropicale et Santé Internationale*, *3*(4).
9. McCormick, C. D., Lea, J., Stryjewska, B. M., Thompson, A., & Fairley, J. K. (2019). Trends of leprosy and multibacillary infection in the state of Georgia since the early 1900s. *PLoS Neglected Tropical Diseases*, *13*(10), e0007713. https://doi.org/10.1371/journal. Pntd.0007713
10. Ouboué, K. & Kaouadio, Y. (2019). La lèpre dans le Gbéké : une étude menée dans le district sanitaire de Bouaké nord-ouest portants sur les facteurs associés à un dépistage tardif de la lèpre. *Bull. de l'ALLF 34(95)*. Consulté le 21-07-2021 sur https //allf. Medilacliste.fr ;
11. Beltrame, A., Barabino, G., Wei, Y., Clapasson, A., Orza, P., Perandin, F., ... & Bisoffi, Z. (2020). Leprosy in Refugees and Migrants in Italy and a Literature Review of Cases Reported in Europe between 2009 and 2018. *Microorganisms*, *8*(8), 1113.
12. Um Boock, A., Ntozo'o, J. P., Boua, B., & Vander Plaetse, B. (2019). Evidence d'une forte endémicité de la lèpre et du pian dans la commune de Baléloko en République Centrafricaine. *Médecine et Santé Tropicales*, *29*(2), 155-158.