

Hansen's physical disabilities: Epidemiological profile of patients from an integration region in Pará–Brazil

Abstract

Hansen's disease is one of the oldest diseases in mankind, characterized as an infectious, chronic, granulomatous disease caused by *Mycobacterium leprae* (*M. leprae*). The objective of this article was to describe the epidemiological profile of physical disability cases due to Hansen's disease in a poor state of an underdeveloped country (Pará-Brazil). All cases of Hansen's disease evaluated in relation to the occurrence of physical incapacity were reported in the metropolitan area registered in the SUS electronic database (DATASUS). Based on the results obtained, it was concluded that the patients who were physically incapacitated in the region and in the period studied, are mostly men, aged between 15 and 59 years, mainly living in the municipalities of Marituba and Belém. Dimorphic and Vischorian were the most frequent, being classified as multibacillary. In addition, the male gender, age greater than 60 years and the multibacillary clinical form. The large number of physical disabilities found in grade II suggests passivity of health services, resulting in late diagnosis. This situation points to the need to intensify control measures, decentralizing them, reinforcing the role of primary care, promoting popular awareness and health professionals training.

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Introduction

Brazil is the second largest country in the prevalence of Hansen's disease, presenting 30,298 cases in 2011 and accounting 90% of all registered cases of the disease in the Americas.¹ The State of Pará is the first in Brazil with 3,876 cases, equivalent to 50.41 of 100,000 habitants.² However, although global prevalence has declined drastically since the introduction of a major treatment, chemotherapy, the detection of cases remains stable, with approximately 700,000 new cases per year.³

Hansen's disease is one of the oldest diseases in mankind, characterized as an infectious, chronic, granulomatous disease caused by *Mycobacterium leprae* (*M. leprae*), or Hansen's bacillus, which has a skin tropism, a cultural attachment and especially for endings nerves of the skin and peripheral nerve trunks, affecting schwann cells, causing irreversible physical incapacities when the diagnosis is late.⁴

Thus, leprosy generates negative impacts on the lives of its patients, since it can cause residual deficiencies after the late treatment, which culminate not only in physical disabilities but also in psychosocial prejudice.⁵ Therefore, the problem of Hansen's disease is not only limited to the large number of cases, but also its high disabling potential, which can interfere with the patient's work and social life, as well as economic losses and psychological trauma.⁶ These disabilities are, in fact, the major cause of stigma and isolation of the patient in society.¹

Moreover, the association of Hansen's disease with the term "leprosy" is also one of the main origins of the prejudices attributed to the disease.⁷ Thus, the implementation of diagnostic tools capable of detecting infection with *Mycobacterium leprae* before clinical manifestations is an important goal that aims at the early diagnosis and prevention of physical disabilities.⁴

In Hansen's disease physical disabilities are classified into three grades: 0, 1 and 2. The patient who presents no problems with the eyes, hands and feet because of loss of sensation and/or visible deformities is classified as grade 0. When patient decrease or lost sensation in the eyes and/or hands and/or feet, without visible deformities is classified

as grade 1. The patient presents deformity and loss of sensitivity in one or more of the following places: (1) - eyes: central corneal opacity, visual acuity less than 0.1; (2) -hand: traumatic lesions and/or trophic lesions is classified as grade 2.⁸

According to Chaves et al.⁹ although the North of Brazil are moving towards the goal of the World Health Organization to maintain the prevalence less than 1 of 10,000 habitants, Hansen is still a serious public health problem in Pará. Even with all the work being done to control it, failures in the diagnosis, treatment, reporting, and completion of medical records prevent a full picture of the disease.

In Pará, the area's most affected are the northeast, southwest and metropolitan areas of Belém, not only because of the high and constant population influx caused by the economic development of the region, but also by the demand for specialized medical care.⁹ In this sense, from the hyperendemicity situation of the metropolitan area of Belém, it is relevant to know the profile related to the clinical and epidemiological conditions of Hansen's patients with physical disability in this region, in order to contribute to a better understanding of the behavior of the disease and its consequences and thus, reorient the health services with the intention of formulating new strategies of action.

In fact, the objective of this article was to describe the epidemiological profile of physical disability cases due to Hansen's disease in a poor state of an underdeveloped country (Pará - Brazil).

Method

The present study was carried out according to the precepts of the Helsinki Declaration and the Nuremberg Code, in accordance with the provisions of Resolution 466/12 of the National Health Council and after the acceptance of the advisor. This research is characterized by being longitudinal, retrospective and ecological, based on the Electronic Database of SUS (DATASUS), which uses as a source the files of the Information System of Notification Diseases (SINAN), which, in the context of Hansen's disease, is fed by the Hansen's notification form, having as its center of interest the Hansen's physical disability in the various degrees. As this study was based on a public domain database, no appreciation was required by the Research Ethics

Committee. It is worth mentioning that, during the period of data collection, the last update of SINAN, dated from 08/08/2014.

All cases of Hansen's disease evaluated in relation to the occurrence of physical incapacity were reported in the metropolitan area of Belém (capital of the state Pará in north of Brazil) from January 2009 to December 2013, registered in the SUS electronic database (DATASUS).

According to the nature of the variables, descriptive statistical analysis of the variables age, sex, clinical form, operational class, municipality and degree of incapacity was applied, and the percentage values of the analyzed data were reported. Bioestat Software 5.3 was also used, in which odds ratios were tested for factors that intervene in the emergence of physical disabilities (risk factors or protection). The test with $p < 0.05$ was considered statistically relevant, when the confidence level $\alpha 0.05 = 1.96$. The test was applied for the variables: sex, age and operational class. As this test should be applied in dichotomized variables, the cases reported as ignored or not evaluated,

in relation to the assessment of physical disability, were included in the group that did not have physical disability. The age variable was grouped into two age groups: 1) from 1 to 59 years and 2) equal to or greater than 60 years.

Results and discussion

Physical incapacity is a public health problem that causes financial, psychological and social harm. This fact is confirmed by Monteiro et al.¹⁰ who affirms the intimate relationship between the onset of physical limitations triggered by leprosy and the reduction of productive capacity and, consequently, unemployment, self-esteem impairment, body image-related disorders and social isolation.

In the present study, it was observed that the profile of patients with physical disability due to Hansen's (Table 1–4) (Figures 1–3) agrees with the findings of Neves et al.¹¹ This states that individuals with physical limitations derived from Hansen's disease are mostly men, adults framed in the multibacillary operational classification.

Table 1 Relationship between age group, sex and operational class and the occurrence of physical disability in patients with Hansen's disease in the metropolitan region of Belém, from 2009 to 2013.

Factor	Physic incapacity		OR	IC95%	ARR	p
	yes	no				
Age Group						
60≤	224	431	1.7359	1.45 a 2.08	11.16%	<0.0001
<60	797	2662				
Sex						
Male	718	1758	1.7995	1.54 a 2.09	10.50%	<0.0001
Female	303	1335				
OP. Class						
Multibacillary	948	1997	7.1272	5.55 a 9.14	25.95%	<0.0001
Paucibacilar	73	1096				

SINAN, 2014; OR, odds ratio; IC, trust index; ARR, relative risk increase

Table 2 Distribution by age group of reported cases of physical disability due to Hansen's disease in the metropolitan region of Belém, from 2009 to 2013.

Age	Ign/Control	Grade 0	Grade I	Grade II	Não Av.	Total
01-14	0	295	23	30	23	371
15-59	3	2068	525	219	273	388
60≤	1	355	155	69	75	655
Total	4	2718	703	318	371	4114

Table 3 Distribution, by sex, of cases of physical incapacity due to Hansen's disease in the metropolitan region of Belém, from 2009 to 2013.

Sex	Ign/control	Grade 0	Grade I	Grade II	Not Av.	Total
Male	3	1548	477	241	207	2476
Female	1	1170	226	77	164	1638
Total	4	2718	703	318	371	4114

Table 4 Distribution, by operational class, of reported cases of physical disability in the metropolitan region of Belém, from 2009 to 2013.

Class Oper Noti	Ign/control	Grade (0)	Grade I	Grade II	Not Av.	Total
Ign/Control	1	1	0	0	0	2
Paucibacillary	0	984	56	17	110	1167
Multibacillary	3	1733	647	301	261	2945
Total	4	2718	703	318	371	4114

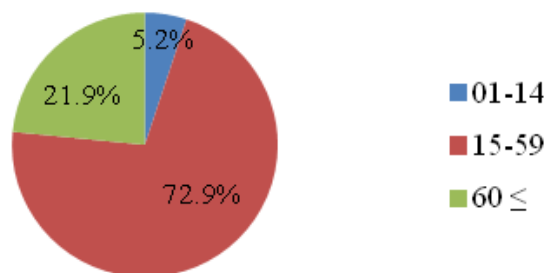


Figure 1 Age range of patients reported with physical disability.

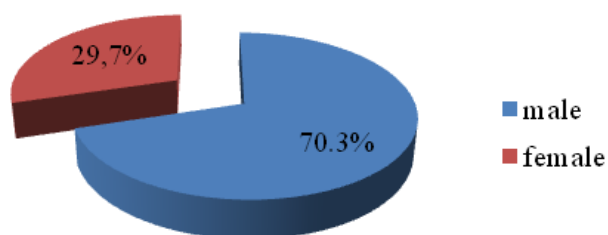


Figure 2 Sex of patients reported with physical disability.

In general, physical incapacity affects mainly men, as was verified by Lana et al.¹² in the Almenara microregion in the Jequitinhonha valley from 1998 to 2004, which registered that 61.2% of individuals with grade 2 were male. The data indicated by the statistical tests of the present study reveal that approximately 70% of the individuals reported with physical incapacity in the metropolitan region of Belém are male (Figure 2). This fact may be related to the higher incidence of hansen cases in men, being the most frequent result in several studies. Monteiro et al.¹³ for example, analyzed the patients with hansen's disease in the state of Piauí and found that the male gender was highlighted in the study with 54.7% of cases.

In addition, it has been found that the chance of physical disability in men is about twice as in women (OR=1.8). In a study carried out in Governador Valadares, Lana et al.¹⁴ analyzed epidemiological and operational indicators, related the occurrence of a greater percentage of disability in males with delay in diagnosis or the search for medical care to be lower by men and the greater abandonment of treatment by men.

In contrast, many studies have pointed changes to this proportion. For example, Vasconcelos¹⁵ found that Hansen cases were predominant on female gender in the municipality of Petrolina-PE. However, a study conducted by Lima et al.¹⁶ with hansen patients, attended in the city of São Luis, MA, did not find a significant difference between men (51%) and women (49%) diagnosed with Hansen's disease.

Authors affirm that there is no statistically significant difference between men and women and the occurrence of physical disabilities in this disease. Ribeiro¹⁷ for example, found that - through an epidemiological study carried out in the Diamantina micro region in the Jequitinhonha valley, MG- approximately 80% of the women diagnosed had physical incapacity, and that 76.5% of the men diagnosed had some disabling degree.

The present study also found that 92.8% of patients with physical disabilities belong to the multibacillary operating class, and that only

7.2% belong to the paucibacillary class (Table 4 & Figure 3). Data confirmed by Correa et al.¹⁸ in a descriptive and retrospective study of data collected from 282 records subjects found that 60% of patients classified as multibacillary had physical limitations and only 32% of paucibacillary individuals had some degree of disability.

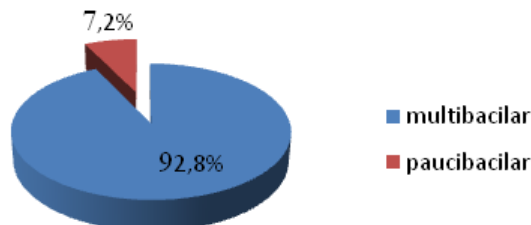


Figure 3 Operational class of patients reported with physical disability.

In this sense, it has been demonstrated, with statistical significance, that the multibacillary operating class has approximately a 7 times greater chance of causing physical incapacity than the paucibacillary form (OR=7.1). Correa et al.¹⁸ obtained similar results and related them with the fact that, in the subjects of this classification, the reactional outbreaks are more frequent, since the amount of bacilli and, later, of bacillary residues is larger, making these individuals more susceptible to neural damage and possible sequelae.

The clinical form is closely related to the operating class. Regarding the clinical form, we observed a predominance of dimorphic (58%) and vischorwian (33%) forms, which correspond to the multibacillary operating class (Table 5 & Figure 4). Alves et al.¹⁹ determined the degree of physical incapacity of patients at a Dermatology Service in the State of São Paulo, from 2003 to 2007, and found that 73% of the patients were classified as multibacillary, that is, dimorphic and virchowian forms (Madrid Classification - 1953), the dimorphous group (55%) being more predominant.

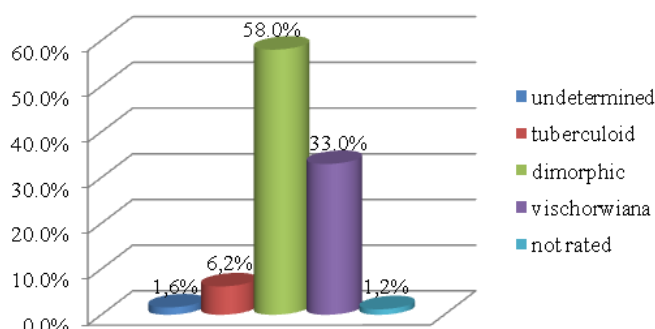


Figure 4 Clinical form of patients reported with physical disability.

This result agrees with the results of Silva et al.²⁰ who through a cross-sectional study that analyzed 341 medical records of the reference unit specialized in health dermatology (Belém-PA) concluded that regarding the association of operational classification with the degree of functional incapacity of the patients, the evidences showed that 26.6% (n=86) of the cases that presented physical disabilities were classified as multibacillary. These have 7.2 times higher prevalence of physical disabilities due to leprosy in relation to patients classified paucibacillary (p-value<0.05)

Regarding age, in the present study, the prevalence of physical disability in the age group of 15 to 59 years, corresponding to 73% of the cases, was observed (Figure 1 & Table 2). This result corroborates

the findings of a study conducted in Vale do Jequitinhonha, which found that 96.9% of those reported with some degree of physical disability were older than 15 years.¹² Likewise, Gomes et al.²¹

analyzed the patients diagnosed with leprosy in Ceará during 2004 and obtained as a result the involvement mainly in the economically active population of 25 to 54 years (51.7%).

Table 5 Distribution, by clinical form, of cases of physical incapacity due to leprosy in the metropolitan area of Belém, from 2009 to 2013

Form clin notif	Ign/Branco	Grau 0	Grau I	Grau II	Não Av.	Total
Ign/Branco	3	6	2	0	1	12
Undetermined	0	333	15	1	25	374
Tuberculoid	0	658	46	17	87	808
Dimorphic	1	1211	404	188	137	1941
Virchowiana	0	492	229	109	111	941
Not rated	0	18	7	3	10	38
Total	4	2718	703	318	371	4114

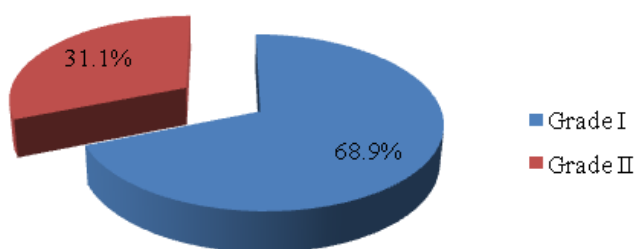


Figure 5 Distribution by grade of reported cases of physical disability.

However, in this study, it can be verified that age above 60 years represented an increase of approximately 1.7 (OR=1.73) times in the chance of developing physical disability. A study by Sobrinho et al.²² evaluated the degree of incapacity of patients undergoing treatment and discharge in 11 municipalities of Paraná and identified that the most frequent age was greater than 50 years (52.5%), followed by the age group of 20 to 49 years (38.4%).

Among the municipalities in the studied region, the number of cases of physical disability was Marituba (60.4%), followed by Belém (32.2%). No statistical data were found in the literature regarding the physical incapacity for leprosy in the municipality of Marituba, which could be correlated with the aforementioned findings. However, it can be inferred that there is a possible failure in the detection and early diagnosis of this condition in said municipality (Figure 6).

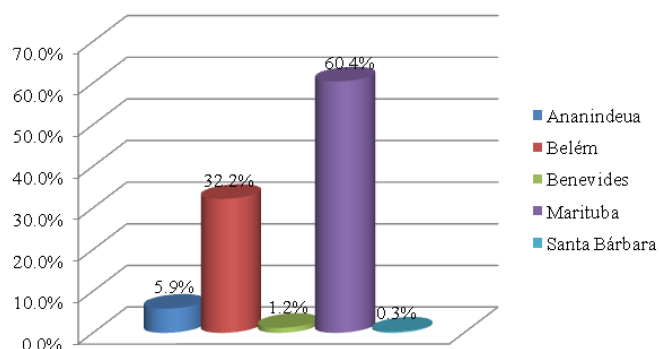


Figure 6 Municipality of patients reported with physical disability.

However, Palácios et al related the large number of cases of Hansen's disease in the metropolitan area of Belém, with the high and

constant population influx caused by the economic development of the region, as well as the demand already directed to the specialized medical care and consequences of other areas of the state.

The Ministry of Health determines as one of the indicators for the analysis of the effectiveness of detection and early diagnosis, the proportion of Hansen cases with degree II of physical disability at the time of diagnosis in relation to all cases reported with degree of incapacity evaluated, being considered of high magnitude the value $\geq 10\%$.²³ In this study, a rate of 31.1% of grade II disability was found (Figure 5), which suggests a high level of late diagnosis, and may be the result of an inefficiency in the detection of this condition. Alves et al.¹⁹ affirm that the degree of incapacity is related to the time of illness, thus, this indicator allows an indirect evaluation of the effectiveness of the activities of early detection and appropriate treatment of the cases.

The high level of late diagnosis may also be related to the difficulty of the perception of signs and symptoms of the disease. Santos et al.²⁴ carried out a qualitative study with the objective of identifying the main difficulties experienced by these patients in obtaining leprosy diagnosis and found that many patients sought help only when they presented some type of physical limitation and already presented transmissible forms of the disease.

Conclusion

Based on the results obtained, it was concluded that the patients who were physically incapacitated in the region and in the period studied, are mostly men, aged between 15 and 59 years, mainly living in the municipalities of Marituba and Belém. Dimorphic and Vischorwiana were the most frequent, being classified as multibacillary. In addition, the male gender, age greater than 60 years and the multibacillary clinical form, were closely related to the increase in the chances of developing physical disabilities, thus configuring risk factors for this condition. The large number of physical disabilities found in grade II suggests passivity of health services, resulting in late diagnosis. This situation points to the need to intensify control measures, decentralizing them, reinforcing the role of primary care, promoting popular awareness and health professionals training.

Acknowledgments

None.

Conflicts of interest

The authors declare there is no conflict of interest.

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