

PHYSICAL DISABILITIES RESULTING FROM HANSEN'S DISEASE IN VALE DO JEQUITINHONHA/STATE OF MINAS GERAIS, BRAZIL¹

Francisco Carlos Félix Lana²
Evaldo Pinheiro Amara³
Fernanda Moura Lanza³
Andrigo Neves e Silva Lopes de Saldanha⁴

Lana FCF, Amara EP, Lanza FM, Saldanha ANSL. Physical disabilities resulting from hansen's disease in Vale do Jequitinhonha/State of Minas Gerais, Brazil. Rev Latino-am Enfermagem 2008 novembro-dezembro; 16(6):993-7.

Leprosy is potentially debilitating. The present study aims at describing and assessing the occurrence of physical disabilities in cases of leprosy in the population of the Vale do Jequitinhonha/MG, in the period 1998-2006. It is an epidemiological descriptive study and the data were collected from the Leprosy Notification Forms. This information was processed using EPI-INFO and analyzed, based on the indicators recommended by the Ministry of Health and the force of association between variables. Of the 1461 cases notified, 46.2% were diagnosed with some kind of physical disability (12.1% degree II). Of these, 59.1% were male; 96.9% of the people were over 15 years old, and 93.2% were multibacillary ($p < 0.001$). A hidden prevalence of 433 cases was estimated in the period 2002-2006. The results show that the diagnosis of Hansen's disease in the region is late, revealing the need to intensify prevention and control.

DESCRIPTORS: leprosy; epidemiology; statistics on sequelae and disability

DESARROLLO DE INCAPACIDADES FÍSICAS RESULTANTES DE LA ENFERMEDAD DE HANSEN EN EL VALLE DE JEQUITIÑOÑA, MG

La lepra, enfermedad de Hansen, es conocida por producir, potencialmente, incapacidades. Se tuvo como objetivo describir y analizar la ocurrencia de incapacidades físicas en los casos de lepra de la población residente en el Valle del Jequitinhonha, MG, en el período de 1998-2006. Se trata de un estudio epidemiológico descriptivo. Los datos fueron recolectados de las Fichas de Notificación de Lepra. Las informaciones fueron procesadas en el software EPI-INFO, analizadas usando como referencia los indicadores recomendados por el Ministerio de la Salud y la fuerza de asociación entre las variables (razón de prevalencias). De los 1.461 casos notificados en el período, 46,2% fueron diagnosticados con alguna incapacidad física (12,1% en el grado II). De esos, 59,1% eran del sexo masculino; 96,9% mayores de 15 años y 93,2% eran multibacilares (valor de $p < 0,001$). Se estimó una prevalencia oculta de 433 casos en el período de 2002 a 2006. Los resultados ponen en evidencia que el diagnóstico de la lepra en esa región está siendo tardío y apuntan para la necesidad de intensificar las estrategias de prevención y control.

DESCRIPTORES: lepra; epidemiología; estadísticas de secuelas y discapacidad

DESENVOLVIMENTO DE INCAPACIDADES FÍSICAS DECORRENTES DA HANSENÍASE NO VALE DO JEQUITINHONHA, MG

A hanseníase é doença potencialmente incapacitante. Objetivou-se descrever e analisar a ocorrência de incapacidades físicas nos casos de hanseníase da população residente no Vale do Jequitinhonha, MG, no período de 1998-2006. Trata-se de estudo epidemiológico descritivo. Os dados foram coletados das Fichas de Notificação de Hanseníase. As informações foram processadas no software EPI-INFO, analisadas tendo como referência os indicadores recomendados pelo Ministério da Saúde e a força de associação entre as variáveis (razão de prevalências). Dos 1 461 casos notificados no período, 46,2% foram diagnosticados com alguma incapacidade física (12,1% no grau II). Desses, 59,1% eram do sexo masculino; 96,9% em maiores de 15 anos e 93,2% eram multibacilares (valor de $p < 0,001$). Estimou-se prevalência oculta de 433 casos no período de 2002 a 2006. Os resultados evidenciam que o diagnóstico da hanseníase nessa região está sendo tardio e apontam para a necessidade de intensificação das estratégias de prevenção e controle.

DESCRIPTORES: hanseníase; epidemiologia; estatísticas de seqüelas e incapacidade

Universidade Federal de Minas Gerais, Brazil:

¹ This research was supported by Council for Scientific and Technological Development, CNPq; ² RN, Ph.D. in Nursing, Associate Professor, e-mail: xicolana@enf.ufmg.br; ³ RN, Master's student, e-mail: evaldoamaral01@yahoo.com.br, e-mail: fmlanza@yahoo.com.br; ⁴ Nursing undergraduate student, e-mail: andrigoneves@hotmail.com.

INTRODUCTION

Leprosy is a potentially disabling infectious disease, caused by a bacillus called *Mycobacterium leprae*. When this parasite settles into the skin tissues and human peripheral nerves, the development of immunologic response is induced. The action of the bacillus in the body and the inflammatory process lead to neuritis, which compromises the autonomous, sensitive and/or motor neural function. When neuritis involves individuals who do not receive proper treatment, the process may become chronic, thus leading to the characteristic physical disabilities of the disease⁽¹⁾.

Human beings are considered the only source of infection of leprosy, and the upper respiratory tract is the main focus of transmission⁽¹⁾. The disease occurs in people regardless of age and gender, however, the main risk group is young poor males who report a leprosy case in their household. In this context, the more intimate and prolonged the contact, the greater the possibility of transmitting leprosy⁽²⁻³⁾. However, there are still great gaps in knowledge about crucial aspects of the epidemiological chain of the disease transmission⁽⁴⁾.

At the end of the 20th century, leprosy was still considered endemic in several developing countries, particularly affecting the poorest levels of society⁽⁴⁾. Prevalence is the indicator used to determine the eradication of the disease. It was set by the World Health Organization (WHO) at less than 1 case per 10,000 inhabitants, and endemic countries will reach this goal up to the year 2010. According to the WHO report, Brazil presented, at the start of 2007, prevalence rate of 3.2 cases/10,000 inhabitants and, in 2006, the detection rate was 2.35 cases/10,000 inhabitants⁽⁵⁾.

Minas Gerais (MG) reported 2,547 cases in 2006, representing a detection rate of 1.31 cases/10,000. At the end of the same year, 3,756 cases were in the active record, resulting in a prevalence of 1.9 cases/10,000 inhabitants⁽⁶⁾. According to data from SES/MG, among the new cases detected in 2006, 62.8% were multibacillary and 10.2% presented level II of physical disability. These indices are considered high and indicate that the diagnoses were performed late. Among the cases diagnosed with level II in the State, 66.9% were men⁽⁶⁾.

Epidemiological behavior of leprosy is related with factors that can increase the number of individuals susceptible to *M. leprae* infection, such as

poor housing conditions, deficient diet, low schooling, and also with migration movements that make it easier for the disease to spread⁽⁷⁾, and with operational service aspects in the introduction of prevention and control actions⁽⁸⁾.

Considering that leprosy is broadly influenced by spatial occupation patterns, it is unequally distributed with a higher concentration in poorer places⁽⁹⁾. Vale do Jequitinhonha fits this profile- a region with the worst socioeconomic indicators in the State of Minas Gerais. Regarding the Human Development Index (HDI), 58.8% of its cities present HDI between 0.57 and 0.65, varying between 74 and 85% of the national average (0.766). When the child mortality rate was assessed, another indicator classically used to assess the regional development level, we observed that 51% of the cities display rates of more than 40 deaths for every 1,000 live births. These values are similar to what is found in cities in the Brazilian North and Northeast⁽¹⁰⁾.

Previous studies⁽¹¹⁻¹²⁾ have shown that Vale do Jequitinhonha has presented problems regarding prevention and control of leprosy, and that local health services cannot detect all cases in the region early, resulting in a high percentage of diagnosed cases in multibacillary clinical forms, already affected by some physical disability⁽¹²⁾.

These disabilities and deformities may lead to some problems, such as decrease in the work capacity, limitation of social life and psychological problems. They are also responsible for the stigma and prejudice carriers face⁽¹⁾. Therefore, beyond its magnitude, leprosy should also be considered in terms of its transcendence, because of human suffering, social discrimination and economic losses that are always associated with the disease, especially if it is not diagnosed and treated timely^(11,13).

The present study aims at describing and assessing the occurrence of physical disabilities in cases of leprosy in the population living in Vale do Jequitinhonha, MG, from 1998-2006.

METHODOLOGY

Descriptive epidemiological study in Vale do Jequitinhonha, MG, formed by five micro regions (Almenara, Araçuaí, Capelinha, Diamantina and Pedra Azul). The place of study was chosen due to its epidemiological relevance as expressed by reports of SES/MG and already emphasized by other studies^(6,11-12).

We have chosen to assess a series of nine years, because we understand that this was a relatively long period in which operational variations that could have occurred would be no longer effective, allowing for a closer idea of the reality of the disease, since the reliability of the results is directly proportional to the number of cases and to the time⁽²⁾.

As leprosy is a mandatory notification and investigation disease in Brazil, for data collection, we used the leprosy notification forms, available at the Coordenadoria Estadual de Dermatologia Sanitária (State Coordination of Sanitary Dermatology) of the SES/MG, from 1998 to 2006. All cases assessed in the research referred to individuals living in Vale do Jequitinhonha. For data processing and statistical analysis, a database was created using Epi-Info software (version 6.04b). After elimination of inconsistencies present in the field (double records, typing mistakes etc.), 1,461 reports were obtained.

To assess epidemiological and operational indicators, we used the parameters recommended by the Ministry of Health⁽¹⁾. The association forces between the presence and absence of physical disabilities at the time of diagnosis were assessed (level 0/levels I and II) together with the variables gender, age group, operational classification and discovery form. Associations with $p < 0.05$ were considered statistically significant.

Physical disabilities in leprosy can be classified into levels 0, 1 or 2, varying according to neural involvement. Level 0 patients have no types of functional disability; level 1 encompasses patients with loss of protective sensibility, and level 2 patients present, in addition to sensitivity loss, complications like trophic ulcers, claw fingers, bone absorption in hands and/or feet, or, even, different eye lesions⁽¹⁾.

To calculate the hidden prevalence, we have used the methodology proposed by OPAS/WHO^(12,14).

RESULTS

During the nine years of the study period, 1,461 new cases of leprosy in Vale do Jequitinhonha were notified, and 99.7% of cases (n=1456) were assessed regarding the level of physical disability at the time of diagnosis. Assessment of disability, a measure that can estimate the transcendence of leprosy, is considered an important indicator of disease control and of the operational capacity of the health service. Among the cases assessed, 34.1% (n=496)

were diagnosed as level I physical disability and 12.1% (n=176) level II.

The results found in this study are summarized in Table 1.

The distribution of cases according to gender demonstrated that 59.1% (n=397) of the cases were males, who presented 1.38 times the prevalence of physical disabilities due to leprosy in comparison with women ($p < 0.001$), according to table 1.

Regarding the age group, 96.9% of the reported people with physical disabilities were over 15 years old, and these people present a 2.61 times higher prevalence of disabilities than patients under 15 (p value < 0.001).

The way a new case is detected acts as an operational indicator of how the health service organizes itself to deliver health care in leprosy. Detection can be classified as passive or active. Passive detection encompasses referrals and spontaneous demand, the active search encompasses the examination of the patients' contacts and the community (schools, jails, lodgment of soldiers etc.). Regarding the detection mode of cases with some level of physical disability, 62.6% (n=401) were diagnosed on spontaneous demand; 27.9% (n=179) by referrals; 7.8% (n=50) by contact examination, and 1.7% (n=11) by examination in the community. Passive detection corresponded to 90.5% of these cases, although the association between these forms of detection and the development of disability was not statistically significant ($p=0.457$).

Table 1 – Distribution of leprosy cases with physical disabilities in Vale do Jequitinhonha, according to gender, age group, operational classification and form of discovery stratified by the level of physical disabilities. Period: 1998-2006

Variable	Level 0		Levels I and II		PR *	p
	N	%	N	%		
Gender						
Male	348	44.4	397	59.1	1.38	<0.001
Female	436	55.6	275	40.9		
Age Group						
0 to 14 years old	92	11.7	21	3.1	2.61	<0.001
≥15 years old	692	88.3	651	96.9		
Operational Classification						
Paucibacillary	396	50.6	46	6.8	5.94	<0.001
Multibacillary	387	49.4	626	93.2		
Form of Discovery						
Active	82	10.7	61	9.5	1.08	0.457
Passive	683	89.3	580	90.5		

Source: Leprosy Notification forms SES/MG
PR = prevalence ratio

In addition to assessing the detection of new cases, it is important to assess the epidemiological context of the disease, including other indicators that refer to the importance of the problem and to the speed at which the disease spreads. An indicator that is indirectly related with the expansion of the disease is the distribution according to clinical forms⁽²⁾. Among the cases with disability level I and II, 93.2% (n=626) were classified as multibacillary (MB), and these present 5.94 times the prevalence of physical disabilities classified as paucibacillary (PB) (p <0.001). Dimorphous leprosy, responsible for extensive and intensive neural involvement⁽¹⁾, was diagnosed in 59.5% (n=400) of all cases with physical disabilities level I and level II. Among these, 55.3% (n=221) were males and 44.8% (n=179) females.

The situation seen in Vale do Jequitinhonha corroborates the existence of hidden prevalence, which is a measure of undiagnosed cases present in the population. In this study, it was estimated that, from 2002 to 2006, 433 cases were not diagnosed or not reported in the region.

Table 2 – Estimate of hidden prevalence of leprosy in Vale do Jequitinhonha – from 1998 to 2006

Indicator	2002	2003	2004	2005	2006	Total
a) new cases	131	192	161	196	201	881
b) assessed	131	191	160	195	200	
c) disabilities I and II	79	83	69	101	101	
d) % of disabilities	60.3	43.5	43.1	51.8	50.5	
e) estimates of undetected cases	79	83	69	101	101	433

Source: Notification Forms of Leprosy – SES/MG

DISCUSSION

The percentage of cases diagnosed with physical disability due to leprosy permits assessing both the operational and the epidemiological component, since late diagnosis favors maintenance of infection sources⁽¹⁴⁾.

In this study setting, this percentage is very high (46.2%), considering that the Plan to Eliminate Leprosy predicts not only the decrease in prevalence, but also the prevention and minimization of physical disabilities caused by the disease⁽⁶⁾.

The percentage of cases of leprosy reported as level II (12.1%) is considered high (≥10%),

according to the parameters of the Ministry of Health⁽¹⁾. In similar studies performed in Minas Gerais, 10.6% was found in Belo Horizonte⁽¹⁵⁾ and 2.4% in Governador Valadares⁽¹⁶⁾, two cities considered as priorities for the control of the disease in the State. It is worth highlighting that, among those younger than 15 years, 18.6% (n=21) already presented some disability at the time of diagnosis. This figure is troubling since the negative repercussion of leprosy in the lives of individuals can be worse when it occurs during childhood.

The greater occurrence of disabilities among males may be related to lesser access to health services, since these services offer health programs for women, as well as to the fact that men are less concerned with their body and appearance, which would lead to late diagnosis⁽¹⁶⁾.

In the initial stage of leprosy, significant neural damage is not observed. However, health professionals should be aware of the disabling potential of the disease, which is caused by the involvement of peripheral nerves. Thus, the ideal form of prevention of physical disabilities is early diagnosis.

Although statistically significant differences have not been found between the detection mode and the presence of disabilities, the MH recommends that, in endemic situations, the active search of cases should be intensified with a view to early diagnosis, avoiding both the negative effects of leprosy in individuals and the accumulation of cases. Additionally, the active search through contact surveillance or examination in the community aims to break the transmission chain of the disease through systemic and organized work, identifying infection sources and preventing contamination of other people⁽¹⁻²⁾. It is important to consider that many cases get to the services spontaneously. In fact, these cases can be considered as contacts that are not referred due to the index-case report. This is especially common in endemic regions, where the ideal is to consider the whole population as in contact with leprosy, without the classical differentiation between intra-household and extra-household contacts⁽¹⁶⁾. Contact surveillance is very important, since it is the main determiner for the incidence of a new case of leprosy, thus leading to implications for future endemic control of the disease⁽³⁾.

On the other hand, the lower proportion of cases detected through collective and contact

examination suggests passivity of the health services. It is believed that the low proportion of cases diagnosed through active search indicates that the local health services are not aware of the relevance of this type of detection of leprosy cases.

The predominance of multibacillary clinical forms among the notified cases with some physical disability is another indicator of late diagnosis, helping to maintain the disease transmission chain, since they are considered the main sources of leprosy infection⁽²⁾.

Hidden prevalence is contributing to the onset of new cases, and also causing disabilities and deformities in individuals living in the region.

Thus, the outcomes found suggest the occurrence of late diagnoses of the disease in Vale do Jequitinhonha. Because the level of disability is associated with health service capacity to prevent deformities, this indicator is also considered relevant to assess the quality of the health program⁽¹¹⁾.

CONCLUSION

The outcomes of the present study show that leprosy diagnosis in Vale do Jequitinhonha is taking long and suggest passivity of the health services in the region to implement disease prevention and control strategies. These services were not capable of capturing and treating all cases in the region, contributing to the maintenance of infection sources and the continuity of the transmission cycle. This demonstrates the need to intensify the actions, especially activities aimed at community awareness and training, so that the disease will cease to be a public health problem

It should be highlighted, however, that in addition to preventing the occurrence of new cases of the disease, there is another major challenge to be faced, which is to prevent the development/worsening of disabilities, so as to minimize the negative impacts of the disease.

REFERENCES

1. Ministério da Saúde (BR). Guia para o controle da hanseníase. Brasília (DF): Ministério da Saúde; 2002.
2. Lombardi C organizador. Hanseníase: epidemiologia e controle. São Paulo (SP): Imprensa Oficial do Estado / Arquivo do Estado; 1990.
3. Van Beers SM, Hatta M, Klatser PR. Patient contact is the major determinant in incident leprosy: implications for future control. *Int J Lepr* 1999; 67:119-28.
4. Visschedijk J, Van de Broek J, Eggens H, Lever P, Van Beers SM, Klatser P. Mycobacterium leprae – millennium resistant! Leprosy control on the threshold of a new era. *Trop Med Int Health* 2000; 5(6):388-99.
5. World Health Organization. *Wkly Epidemiol Rec* 2007; 82(25):225-32.
6. Secretaria de Estado da Saúde (MG). Encontro Estadual 2007 - Hanseníase: procurar para curar. Belo Horizonte (MG): Coordenadoria Estadual de Dermatologia Sanitária; 2007.
7. Kerr-Pontes LRS, Montenegro ACD, Barreto ML, Werneck GL, Feldmeier H. Inequality and leprosy in Northeast Brazil: an ecological study. *Int J Epidemiol* 2004; 33:262-9.
8. Waldman EA, Silva LJ, Monteiro CA. Trajetória das doenças infecciosas: da eliminação da poliomielite à reintrodução da cólera. *Informe Epidemiológico do SUS* 1999; 8(3): 5-47.
9. Dias MCFS, Dias GH, Nobre ML. Distribuição espacial da hanseníase no município de Mossoró/RN, utilizando o Sistema de Informação Geográfica – SIG. *An Bras Dermatologia* 2005; 80(Suppl 3):289-94.
10. Martins RB, Libânio JC. Atlas do desenvolvimento humano no Brasil [CD-ROM]. ESM Consultoria; 2003.
11. Lana FCF, Amaral EP, Franco MS, Lanza FM. Detecção da Hanseníase no Vale do Jequitinhonha – Minas Gerais: redução da tendência epidemiológica ou problemas operacionais para o diagnóstico?. *Hansen Int* 2004; 29(2):118-23.
12. Lana FCF, Amaral EP, Franco MS, Lanza FM. Estimativa da prevalência oculta da hanseníase no Vale do Jequitinhonha – Minas Gerais. *REME* 2004; 8(2):295-300.
13. Duarte MTC, Ayres JA, Simonetti JP. Socioeconomic and demographic profile of leprosy carriers attended in nursing consultations. *Rev Latino-am Enfermag* 2007 set-out; 15(esp):774-9.
14. Suárez REG, Lombardi C. Estimado de prevalencia de lepra. *Hansen Int* 1997; 22(2):31-4.
15. Lana FCF, Lima RF, Araújo MG, Fonseca PTS. Situação epidemiológica da hanseníase no município de Belo Horizonte/MG – Período 92/97. *Hansen Int* 2000; 25(2):121-32.
16. Lana FCF, Velásquez-Meléndez JG, Branco AC, Malaquias LC, Teixeira S, Oliveira VA, Rosado V, Lanza FM. Transmissão e controle da hanseníase no município de Governador Valadares/MG – Período de 1990 a 2000. *Hansen Int* 2002; 27(2):83-92.