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Original Article

Clinical-epidemiological characterization of leprosy cases with physical disabilities

Caracterização clínico-epidemiológica de casos de hanseníase com incapacidades físicas

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Objective: to characterize the clinical-epidemiological profile of cases of multibacillary leprosy, diagnosed with physical disabilities. **Methods:** this is a cross-sectional and retrospective study. The sample consisted of 276 cases of diagnosed leprosy. **Results:** leprosy mainly affects males, of brown skin color, low education and with a mean age of 51.96 years old (standard deviation, SD=20.33 years old). The Virchowian and dimorphic clinical forms are mainly responsible for the transmission of the disease and the development of physical disabilities. Decreased or lost sensation in hands and feet, trophic ulcers and traumatic injuries, as well as clawed hands were the physical disabilities prevalent in the study. **Conclusion:** the cases with physical disabilities are predominantly affected by multibacillary clinical forms, and they can be inferred in the maintenance of the transmission chain and the late detection of severe forms of leprosy.
Descriptors: Leprosy; Communicable Disease Control; Primary Care Nursing.

Objetivo: caracterizar o perfil clínico-epidemiológico de casos de hanseníase multibacilar, diagnosticados com incapacidades físicas. **Métodos:** estudo transversal, retrospectivo. A amostra constituiu-se de 276 casos de hanseníase diagnosticados. **Resultados:** a hanseníase acomete, principalmente, indivíduos do sexo masculino, de cor parda, baixa escolaridade e com idade média de 51,96 anos (desvio padrão, DP=20,33 anos). As formas clínicas virchowiana e dimorfa são as principais responsáveis pela transmissão da doença e desenvolvimento de incapacidades físicas. Diminuição ou perda da sensibilidade em mãos e pés, úlceras tróficas e lesões traumáticas, bem como mãos em garras foram as incapacidades físicas prevalentes no estudo. **Conclusão:** os casos com incapacidades físicas são acometidos predominantemente de formas clínicas multibacilares, podendo-se inferir em manutenção da cadeia de transmissão e detecção tardia das formas graves da hanseníase.
Descritores: Hanseníase; Controle de Doenças Transmissíveis; Enfermagem de Atenção Primária.

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Introduction

Leprosy is defined as a chronic granulomatous infection caused by a bacillus known as Mycobacterium leprae. This disease has high infectivity and low pathogenicity. Brazil ranks second in absolute numbers to leprosy cases, only behind India. Also, Brazil is the only country that has not reached the goal of eliminating the disease. Therefore, it is considered as a public health problem, given the established prevalence rate of fewer than 1 case/10,000 inhabitants[1].

Leprosy is still considered a challenge for public health because, despite implementations about the treatment of polychemotherapy, data show that in 2011 the detection was 33,955 new cases, with a prevalence coefficient of 1.54/10,000 inhabitants worldwide and around 250,000 new cases are detected annually[2].

The strategy to reduce leprosy burden and to achieve the goal of eliminating the disease as a public health problem at the national level is mainly based on increasing the rate of early detection and cure of diagnosed cases, since leprosy is not homogeneously distributed in Brazil, because there are geographic areas of risk that concentrate more endemicity than other regions[3].

After the implementation of the Global Leprosy Program, there was a positive result regarding the prevalence of cases registered in the last twenty years, through the implementation of multidrug therapy. However, possible advances in the leprosy area are hampered by the lack of new techniques to solve the problems of the continuity of detection of new cases and the consequences of the disease in the long-term[4].

According to data from the epidemiological surveillance of the city of Caxias/MA, Brazil, there were 114 cases of leprosy reported in 2014 involving the urban and rural areas, included in the Notifiable Diseases Information System. In the period from 2012 to 2013, there were 40 cases of leprosy with grade I and 16 cases of leprosy with grade II disability reported[5].

It should be emphasized that the situation of cities with a high leprosy detection rate needs to be investigated to identify difficulties and strategies to overcome them. Therefore, it was proposed to investigate the clinical and epidemiological profile of these leprosy cases, taking into consideration the age range, gender, education, clinical and operational classification, number of nerves affected and treatment schedule.

Also, it is necessary that the active search for cases of leprosy be performed during the daily activities of the primary health care services, offering the polychemotherapy treatment immediately after the diagnosis, preventing the maintenance of the chain of transmission of the disease. Considering that leprosy has incapacitating potential, it is necessary for the nursing professional to perform the dermatological-neurological examination during the entire treatment to verify nerve changes that may compromise the patient´s clinical condition.

Thus, the objective was to characterize the clinical-epidemiological profile of leprosy cases diagnosed with physical disabilities.

Methods

This is a cross-sectional and retrospective study. The study was conducted by the Epidemiological Surveillance Service of the city of Caxias/MA, Brazil, where seven Basic Health Units were selected with family health teams, using the criterion of the highest concentration of reported cases of leprosy in 2014 and representing 85.0% of the reported cases of leprosy in the period selected. Data collection occurred from April to July 2015.

The study population was 747 cases reported with multibacillary and paucibacillary leprosy in the period 2010-2014. From them, 276 cases of leprosy were included in the study. The inclusion criteria were: the existence of a medical record in the basic health unit under study, being over 18 years old, being notified of a case of paucibacillary or multibacillary leprosy; having a dermatological-neurological exami-

nation and reside in the city of the study. The criteria for exclusion were patients transferred to another city or State and treatment abandonment.

A checklist was used to collect data on medical records, adapted to the compulsory notification form for the leprosy of the patients of the respective basic health units. Also, records of the epidemiological surveillance of the municipality were verified to verify the number of cases diagnosed with leprosy. The variables studied were: age, gender, race, education, clinical and operational classification, physical disability, the number of nerves affected and treatment schedule.

The data were typed in double entry, validated and analyzed using EpiInfo software (Version 3.5.3) in Portuguese. Pearson's Chi-square test was used to investigate the association of qualitative variables such as gender, race, education, clinical and operational classification, physical disability (independent variables), and multibacillary cases (dependent variable). The Student's T test for comparison of means of the quantitative variable age was used (independent variable). The level of significance adopted in the study was 0.05 with a 95.0% confidence interval.

The study complied with the formal requirements contained in the national and international regulatory standards for research involving human beings.

Results

Patients were grouped into multibacillary and paucibacillary for analysis purposes, and the result showed the relationship between these two variables and the physical disabilities.

The analysis of the sociodemographic characteristics of multibacillary cases (Table 1) showed that there was a predominance of males, 73.8% (96/160); Low education level with 64.7% (57/160) of illiterate and 55.9% of brown skin color (109/160). The mean age was 51.96 years old (standard deviation=20.33 years old). Among these variables, gender and education presented statistically significant differences in a higher proportion of multibacillary cases among men (p<0.001) and in illiterate individuals or with up to four years of study (p=0.007). The age variable had no statistically significant difference on average (p=0.238).

Table 1 - Sociodemographic characteristics of multibacillary and paucibacillary leprosy cases assisted at the Basic Health Units under study

Variables	Multibacillary cases		p
	Yes n (%)	No n (%)	
Gender			<0.001*
Male	96(73.8)	34(26.1)	
Female	64(43.8)	82(56.1)	
Education (years)			0.007*
Illiterate	57(64.7)	31(35.2)	
Up to 4	44(68.7)	20(31.2)	
5 and 9	37(51.3)	35(48.6)	
10 and 12	18(50.0)	18(50.0)	
>12	4(25.0)	12(75.0)	
Race			0.289*
White	14(58.3)	10(41.6)	
Black	36(67.9)	17(32.0)	
Brown	109(55.9)	86(44.1)	

*Chi-square test

Regarding the clinical forms, the Virchowian had a greater impact on disability and physical deformities, representing 0.6% (30/46) of the cases, followed by the dimorphic clinical form 0.3% (25/73). In the undetermined and tuberculoid clinical forms, there was a record of the development of physical disability in 0.02% (01/44) and 0.02% (01/51) respectively. In the non-classified clinical forms, 0.24% (15/62) presented some physical disability (Table 2). It should be emphasized that there was a significant association between operational classification and development of physical disabilities (p<0.001).

Table 2 - Association between clinical forms and development of physical disabilities in cases of leprosy treated in the Basic Health Units

Variables	Physical disability		p
	Yes	No	
	n (%)	n (%)	
Clinical forms			<0,001*
Undetermined	1(2,0)	43(98,0)	
Tuberculoid	1(2,0)	50(98,0)	
Dimorph	25(34,0)	48(66,0)	
Virchowian	30(65,0)	16(35,0)	
Not classified	15(24,0)	47(76,0)	

*Chi-square test

Table 3 - Physical disabilities recorded in cases of leprosy treated in the Basic Health Units, according to the predominance of physical disabilities

Physical disabilities	Yes	No
	n (%)	n (%)
Eyes		
No problem with the eyes	154 (96.3)	115 (99.1)
Lagophthalmos and/or ectropion	1 (0.6)	-
Corneal opacity	1 (0.6)	1 (0.9)
Visual acuity less than 0.1	4 (2.5)	-
Hands		
No problem with the hands	126 (78.8)	115(99.1)
Decreased or lost sensitivity	23 (14.4)	1 (0.9)
Traumatic injuries	1 (0.6)	-
Claw hands	10 (6.3)	-
Resorption	1 (0.6)	-
Nose		
No problem with the nasal mucosa	159 (99.4)	115 (100.0)
Perforation of the nasal septum	1 (0.6)	-
Feet		
No problem with feet	118 (73.8)	115 (99.1)
Decreased or lost sensitivity	30 (18.8)	1 (0.9)
Trophic ulcers and traumatic injuries	11 (6.9)	-
Fallen arches	4 (2.5)	-

Regarding the type of physical disability showed before, the results during and after the polychemotherapy treatment showed that the predominant physical disabilities were: decrease or loss of sensation in hands and feet, with 14.4% and 18.8% respectively, ulcers trophic lesions and traumatic lesions in feet with 6.9%, followed by claw-hands with 6.3%, feet loss and visual acuity less than 0.1, both corresponding to 2.5% of cases (Table 3).

Discussion

The study shows that leprosy affects more men than women[6], indicating that men are the most affected and exposed to the triggering factors of the disease. A study of 15,648 cases of leprosy in the state of Rondônia between 2001 and 2012 also found a predominance of males in 57.1% (8,928/15,648) of the cases studied[7].

However, surveys conducted in 2000 and 2006 began to show a slight increase in female rates[8]. The gradual increase indices may be due to an increase in infected women or due to greater accessibility to the health service, and women are more concerned with self-image than men[9].

The mean age most affected in cases of multibacillary leprosy were 51.96 years old (standard deviation=20.33 years old). Similar results were found in a historical series of new cases of leprosy residing in the State of Maranhão, between 2001 and 2012, to know the profile of the reported cases of leprosy and its spatial and temporal distribution. When investigating data from the epidemiological surveillance system, 54,719 new cases of leprosy were reported in the state, with a predominance of individuals aged 20-39 years old, 35.1% and 40- 59 years old, 28.4%[10].

Regarding the brown skin color, the results of this study were similar to a study conducted in the city of Montes Claros, Brazil, with 230 cases reported with leprosy, aiming at characterizing the epidemiological profile of patients assisted at health centers, in which

the prevalence of the brown skin color in 61.3% cases of leprosy[11].

These values are related to the ethnic composition of the State because, in the state of Maranhão, the brown color due to the strong miscegenation has a predominance about the others according to the 2010 Census published by the Brazilian Institute of Geography and Statistics[12]. Also, a recent study shows that in the interval between 2001 and 2012 among the new cases of leprosy, 28,457 cases (52.5%) were in brown individuals[10].

The educational data found in this study were consistent with other studies on epidemiological profile carried out in Brazil, which report low education as an important characteristic of individuals with leprosy[13-14]. The low education level of the population may be associated with precarious socioeconomic aspects[10].

Low educational level can directly influence the transmission of infectious agent and increase of disease in the populations, since the community is deprived of basic knowledge on prevention and health promotion, besides contributing to a lower adherence to drug treatment and, consequently having a higher rate of patients presenting with reversible or irreversible physical disabilities before and during treatment. This may hinder patients to understand the treatment and care guidelines[8].

A study carried out in Brazil showed a predominance of multibacillary cases in comparison to paucibacillary cases, corroborating the findings of this study[6]. The predominance of multibacillary cases affected by the dimorphic and Virchowian clinical forms was also demonstrated in a study carried out in the city of São Luís[15]. Also, a previously conducted study in the city of Montes Claros corroborates the results found in this survey and shows that multibacillary cases are associated with nine times higher chance of developing some degree of physical disability[14].

Regarding the clinical form, results similar to this study were found in São Luís-MA, through a study of 85 patients, where the predominant clinical form was the Virchowian, 42.3% (36/85), followed by dimorphic, 30.6% (26/85)[16].

A study carried out in Campos dos Goytacazes, Brazil, with 240 records, showed divergent results to this study, being the most incident form the dimorphic 57.4%, followed by the Virchowian clinical form 41,2%[17].

Other authors emphasize the strong incidence of the dimorphic clinical form in the Northeast region[10,18]. These results demonstrate that these cases are being detected very late, and acting as maintainers of the active transmission of leprosy, which results in a high detection rate of the disease[19].

It is important to consider that the permanent self-care associated with the polychemotherapy treatment and continuous evaluation of both the new cases and the old ones can avoid the physical incapacities consequent to the aggravation. It should be noted that leprosy can lead to serious impairments in patients´ quality of life, especially for social and psychological impairment.

Besides the importance of the guidelines on self-care, it is important to highlight the need to use timely detection strategies, health teams´ commitment to active case search, health education and contact surveys, since these actions directly influence this indicator[5]. It should be noted that the Enhanced Global Strategy[20] emphasizes the quality of health services directed at assisting patients with leprosy as an essential component of an efficient program.

This study showed that hands and feet were most affected by leprosy. However, divergent results were found in São Luis when investigating the neural complications and the degree of physical disabilities in the eyes, hands, and feet before and after treatment. Regarding the frequency of neural complications, it was observed that at the beginning of treatment, 51.6% of the patients had complications in the eyes,

40.6% in the hands and 52.3% in the feet. However, after treatment, there was a decrease in the proportion of these neural complications[21].

Thus, it is emphasized that neurological examination is fundamental to the definition of the degree of physical disability, as well as for the planning of actions aimed at the prevention of disabilities. The earlier the leprosy is diagnosed, the lower the degree of disability.

Conclusion

In this study, it was identified that leprosy affects more males, with a mean age of 51.96 years old, brown skin color and with a low level of education. Among the cases with a physical disability, the prevalent clinical forms were Virchowian and dimorphic, resulting in a greater number of multibacillary cases, considered as a source of infection and maintenance of the disease transmission chain.

The city is still a hyperendemic area, where there is a severe detection of severe forms of leprosy, and it can be inferred that the chain of transmission in the municipality continues to be active. Therefore, it is necessary to plan and execute actions that seek to contribute to the better performance of nursing professionals in the early detection of the disease, especially when monitoring and evaluating the physical disabilities caused by leprosy, preferably in Primary Health Care.

Collaborations

Sousa GC contributed to the project design, data analysis, writing and critical review of relevant intellectual content and final approval of the article. Moura MES contributed in the project design and data analysis. Vieira FS, Oliveira DEP and Costa ES contributed to the writing of the article and final approval of the version to be published.

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