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Epidemiologic profile of the leprosy of the city of Teresina, in the period of 2001-2008 [*]

Perfil epidemiológico da hanseníase no município de Teresina, no período de 2001-2008

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Abstract: BACKGROUND: Leprosy is an infectious disease that can lead to functional and physical disability. It is a major public health problem in some regions, requiring knowledge of its epidemiological variations so that strategies for disease control can be subsidized.

OBJECTIVE - To describe the epidemiological profile of the city of Teresina from 2001 to 2008. Methods - Data on leprosy in the city of Teresina from 2001 to 2008, which were present on the official database of the Information System for Notifiable Diseases of the City Health Foundation, were analyzed.

RESULTS - The data show an average detection rate of new cases of 96.21 cases per 100,000 inhabitants. Among those younger than 15, there was a peak of 40 cases per 100,000 inhabitants in 2003. Grade 2 disability evaluated at diagnosis ranged from 5 to 7% and at discharge from 2.77 to 0.14%. Prevalence is high, varying from 8 to 11 cases per 10,000 inhabitants. Regarding clinical form, there is a predominance of forms I with 30% of the cases and D with 28% of the cases at the end of the series; and in relation to operational classification, the average is 62% of paucibacillary cases and 37.86% of multibacillary cases. Among the reported cases, there is a slight predominance of females at the end of the series.

CONCLUSION - Leprosy is hyperendemic in Teresina and it can lead people at working age to inactivity.

Keywords: Control; Endemic diseases; Health surveys; Leprosy; Public health

Resumo: FUNDAMENTOS: A hanseníase é uma doença infectocontagiosa que pode levar a incapacidade física e funcional. É um importante problema de saúde pública em algumas regiões, sendo necessário o conhecimento das variações epidemiológicas para subsidiar estratégias de controle da doença.

OBJETIVO: Descrever o perfil epidemiológico do município de Teresina de 2001-2008.

MÉTODO: Foram avaliados dados de hanseníase de Teresina entre 2001-2008, presentes no banco de dados oficial do Sistema de Informação de Agravos de Notificação, da Fundação Municipal de Saúde.

RESULTADOS: Os dados revelam um coeficiente de detecção de casos novos com média de 96,21 casos por 100.000 hab. Entre os menores que 15 anos, houve um pico de 40 casos em 100.000 hab. em 2003. O grau de incapacidade II avaliado no momento do diagnóstico variou de 5%-7% e no momento da alta de 2,77%- 0,14%. A prevalência é alta, variando entre 8-11 casos em 10.000 hab. Em relação à forma clínica no final da série há uma predominância das formas I com 30% dos casos e D com 28% dos casos. Quanto à classificação operacional a média é de 62% de casos paucibacilares e 37,86% multibacilares. Entre os casos registrados há uma discreta predominância no sexo feminino no final da série.

CONCLUSÃO: A hanseníase é hiperendêmica em Teresina e pode levar à inatividade pessoas em idade produtiva.

Palavras-chave: Controle; Doenças endêmicas; Hanseníase; Levantamentos epidemiológicos; Saúde pública

INTRODUCTION

Hansen's disease or leprosy is an infectious disease caused by *Mycobacterium leprae*, which has affinity for skin and peripheral nerves and sometimes leads patients to physical and functional disability.[1] It is transmitted through direct contact with infected patients who have not been treated, being considered highly infectious but not very pathogenic.[2]

Despite being a secular disease and the first infectious disease to have its etiological agent discovered, specific treatment emerged only in the middle of the last century with the advent of sulfone, allowing patients to be treated on an outpatient basis, thus ending isolation in colonies.[3] Its spread throughout the world is associated with low socio-economic conditions, poor sanitary conditions and hygiene and biological factors. [4]

Leprosy is a public health problem. In 1991, the World Health Organization (WHO) set an elimination goal for prevalence of less than 1 case per 10,000 individuals, implementing multidrug therapy (MDT) with rifampicin, dapsone and clofazimine in addition to early detection of cases as a main strategy. [5,6]

The epidemiology of leprosy in relation to its geographical distribution remains somewhat unclear. The main historically endemic areas in the world have tropical climate with high temperatures and rainfall, however leprosy has also presented high incidences in temperate and cold regions, in spite of being eliminated in the later without a definite explanation.[4,6] Currently, 80% of the new cases are concentrated in countries located in the intertropical zone. Globally, Brazil along with the Democratic Republic of Congo, Mozambique and Nepal has not reached the elimination goal of 1 case per 10,000 inhabitants. Together, these four countries account for 23% of all the new cases detected in 2006 and 34% of all the cases reported early in 2007. [7]

Brazil features as the most endemic country in the Americas, with 94% of the new cases reported, and as the second in number of cases worldwide, following India.[7,8] In 2007, the rate of new cases of the disease in Brazil was 21.08 per 100,000 inhabitants, with higher incidence in the North (54.25 per 100,000 inhabitants) and Northeast (31.53 per 100.000 inhabitants) regions, according to the Ministry of Health. The state of Piaui is in 7th place at the national level and in 2nd place among the Northeastern states, with 47.01 cases per 100,000 inhabitants. [9] According to a series presented by the State Department of Health of Piaui, from 2001 to 2006, Teresina contributes with nearly 50% of the reported cases in the state. [10]

According to ordinance No. 125/SVS-SAS of March 26, 2009, health surveillance should prioritize finding new cases through active detection (investigation of contacts) and passive detection (voluntary reports and referrals), with the rate of annual new cases in children younger than 15 becoming the most important indicator for disease control, with a reduction goal set at 10% by 2011. [11]

The city of Teresina has not reached the goal proposed by WHO of a prevalence rate of leprosy of less than 1 case per 10,000 inhabitants, and despite 80% of the population being covered by teams of the Family Health Strategy (FHS), wich develop actions to control leprosy, it still presents a large number of new reported cases.[12] Based on this scenario, this study aims to describe the epidemiological profile of leprosy in the city of Teresina in the period ranging from 2001 to 2008, when the FHS teams were implemented, in order to help define strategies to control the disease.

MATERIAL AND METHODS

This is a descriptive, observational and retrospective study in which consolidated data on leprosy in the city of Teresina from 2001 to 2008 were analyzed.

We evaluated data from the official database of the Information System for Notifiable Diseases (SINAN) of the City Health Foundation (FMS) of the city of Teresina. The data concerned the following variables: new cases by sex and age, cases diagnosed according to operational classification, cases clinically diagnosed, evaluation of grade 2 disability in the year of diagnosis and at discharge. These data made it possible to obtain indicators of morbidity, magnitude, and epidemiological profile.

The indicators were based on population data determined by the population census 2000 and population estimates of the Brazilian Institute of Geography and Statistics (IBGE), searched on the website of the Department of Informatics of the Unified Health System (DATASUS). [13]

The data were processed using Excel for Windows in the construction of tables and graphs. For evaluation of the epidemiological indicators in this population, we considered the parameters established by WHO, recommended by the Ministry of Health and found in ordinance No. 125/SVS-SAS of March 26, 2009.

RESULTS

An analysis of the data obtained from SINAN covering the period from 2001 to 2008 reveals a high rate of detection of new cases in the period, reaching an average of 96.21 cases per year in a sample of 100,000 inhabitants (Graph 1). In the same graph, the line representing cases of patients under 15 years old shows a slight decline in 2002, followed by a consid-

erable increase in 2003, when it reached 40 cases per 100,000 inhabitants. Starting in 2004, there was a decrease in detection, which remained stable until 2005, followed by small oscillations, but with a rising trend by 2008.

Regarding the results concerning the evaluation of grade 2 disability performed at diagnosis, more than 5% of the cases evaluated corresponded to grade 2 disability in 2001, followed by a reduction by the year 2003. After 2004, there was a progressive increase in this percentage, reaching approximately 8% in 2007 (Graph 2).

Regarding evaluation of grade 2 disability among the cases evaluated at discharge, it was observed that almost 3% of the population under study was involved in 2001, with a significant reduction in 2002. In 2003, there was a small reduction in the number of cases in comparison with the previous year, about 0.6%, but a steady increase was observed from that year to 2006. A decrease was observed again in 2007, and 2008 had the lowest percentage of grade 2 disability (Graph 2).

Regarding the prevalence of leprosy per 10,000 inhabitants, there were 11.37 cases in 2001, considering only those living in Teresina and under treatment. However, in the subsequent years, alternating periods of slight reductions and slight increases in the number of cases were observed, resulting in high prevalence rates, with variations between 8.38 and 11.37 cases per 10,000 inhabitants. (Graph 3).

Concerning the classification according to clinical form, Table 1 shows a decrease in the tuberculoid form (T) from 34.7% to 25.39% and a steady increase of indeterminate forms (I) from 28.22% in 2001 to 30.21% in 2008. As for the dimorphous (D) form, the

data present a percentage of 20.02% at the beginning of the series, reaching 28.09% in 2008. Among the patients classified as lepromatous (L) or Virchowian (V), there was a decrease in absolute numbers from 121 cases in 2001 to 86 cases in 2008. Table 2 presents the distribution according to the classification by WHO, with initial predominance of paucibacillary (PB) forms followed by an increase in multibacillary (MB) forms, with an average of 460.62 (62.05%) and 278.87 (37.86%) cases, respectively. With regard to gender distribution, there is a slight predominance of females compared to males, with a small percentage variation over the series.

DISCUSSION

According to WHO, the trend in detection of leprosy in Brazil showed no decline in recent years. Detection rates are indicators of transmission of leprosy. These remain high and unchanged after nearly ten years of high coverage with multidrug therapy (MDT). [2,3,14] However, it is necessary to be alert, for a reduction of these indicators in some areas may point to a decrease in active case search. To avoid this shortcoming, ordinance No. 125/SVS-SAS strengthens case surveillance through active detection, with epidemiological investigation of contacts and examination of the community with surveys and campaigns.

A study conducted in China in 2001, aiming to evaluate strategies for leprosy control, showed a favorable impact on epidemiological indicators and context of the disease after some interventions, such as mass clinical examination. [8] Although there is little in the literature on studies in Brazil concerning the relationship between strategies of operational intervention and epidemiological indicators, a survey in
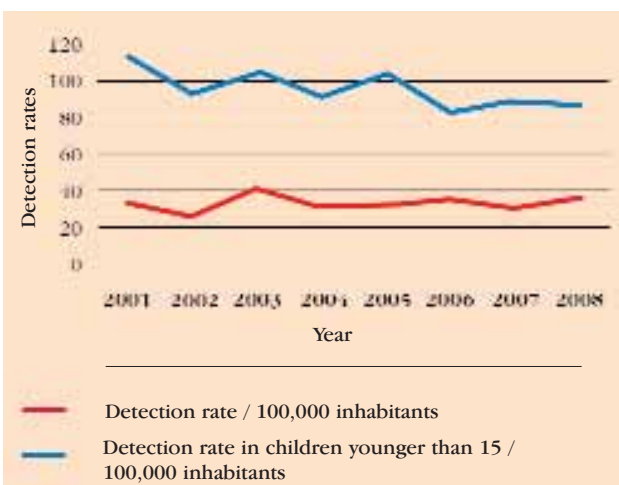
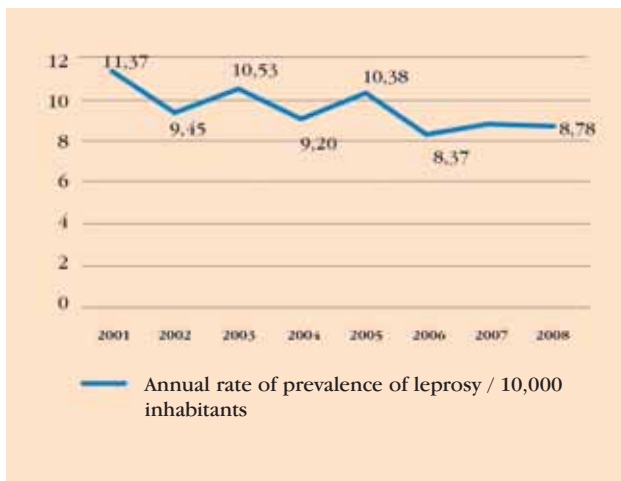**GRAPH 1:** Annual detection rates of new cases of leprosy and detection in children younger than 15. Teresina (PI). 2001-2008
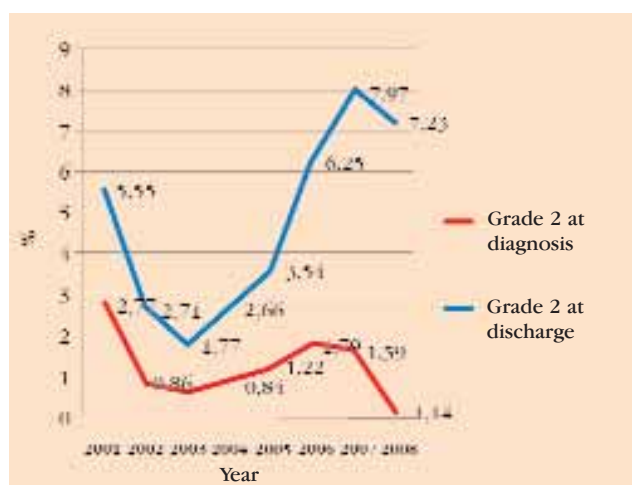
GRAPH 2: Proportion of grade 2 disability at diagnosis and at discharge. Teresina (PI). 2001-2008

Source: Sinan

GRAPH 3: Annual rate of prevalence of leprosy/ 10,000 inhabitants. Teresina (PI). 2001-2008

Rio de Janeiro also showed a positive influence of decentralization of diagnosis and treatment of leprosy in the detection of new cases. [8]

In relation to the number of new cases of leprosy detected, a municipality can be classified, according to the most recent parameters of the Ministry of Health (MOH), in hyperendemic, when the number of cases is greater than or equal to 40.00 per 100,000 inhabitants; very high: 20.00 to 39.99 per 100,000 inhabitants; high: 10.00 to 19.99 per 100,000 inhabitants; average: 2.00 to 9.99 per 100,000 inhabitants; and low, when less than 2.00 per 100,000 inhabitants. Therefore, graph I shows that the rates in the city of Teresina remained high during the period 2001-2008, which characterizes it as hyperendemic, showing that there is continued transmission of the disease, which points to the need of improving actions aimed at strengthening early detection of cases. If we consider the possibility of cases being underreported, the

dimensions of the disease in the city of Teresina becomes even higher.

The problem of leprosy in children younger than fifteen years old and its consequences have been studied by several authors and international organizations. Although leprosy is considered a disease of young and adult people, there are numerous reports of cases of this disease in the age group varying from 0 to 14 years old. This fact is justified by an increase in the transmission chain of the bacillus in the community, in addition to a deficiency in the surveillance and control of the disease. In endemic countries, children come early into contact with bacilliferous patients, and it is possible to observe detection of the disease among children aged three to five years, with cases being rarely observed among children under two. Currently,[14,15] the detection rate in children younger than 15 is considered the main indicator for disease control by the Ministry of Health, with a goal of achieving a rate of 10% by 2011. [16]

Graph 1 shows that there is a high number of cases among children younger than 15 in the city of Teresina (PI). This number remains around 35 to 40 cases per 100,000 inhabitants, again characterizing the region as hyperendemic (more than 10 cases per 100,000 inhabitants). These figures follow the data presented in the literature, which show high rates in underdeveloped regions like Africa, with 19.2%, and Asia, where there are regions with 10.3% of cases of leprosy in children under fifteen, respectively. [7] In Brazil, a 1985-2002 series shows that the Northeast region had an increase in this rate in all of the states of the region, and Piaui presented a variation of 420.7%. [4]

Besides the large number of leprosy cases which determines the disease as a public health problem, its high disabling potential may interfere with the productive and social life of a patient, causing economic loss-

TABLE 1: Distribution of leprosy according to clinical form. Teresina (PI). 2001-2008

Year	I/W		I		T		D		V		NC		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
2001	0	0	234	28,23	285,00	34,38	166	20,02	121	14,60	23	2,77	829	100
2002	0	0	213	30,43	243,00	34,71	122	17,43	96	13,71	26	3,71	700	100
2003	0	0	250	31,57	296,00	37,37	153	19,32	72	9,09	21	2,65	792	100
2004	0	0	239	33,47	209,00	29,27	118	16,53	96	13,45	52	7,28	714	100
2005	2	0,24	274,00	33,46	272,00	33,21	142	17,34	92	11,23	37	4,52	819	100
2006	5	0,74	206,00	30,65	196,00	29,17	145	21,58	86	12,80	34	5,06	672	100
2007	48	6,96	207,00	30,00	140,00	20,29	183	26,52	50	7,25	62	8,99	690	100
2008	1	0,14	213,00	30,21	179,00	25,39	198	28,09	86	12,20	28	3,97	705	100

Source:SINAN   I/W Ignored and White   T: Tuberculoid   V: Virchowian
             I: Indeterminate   D: Dimorphous   NC: Non classified

TABLE 2: Leprosy frequency according to the classification by the WHO. Teresina (PI). 2001- 2008

Year	I/W		PB		MB		TOTAL	
	N	%	N	%	N	%	N	%
2001	0	0,00	524	63,21	305	36,79	829	100
2002	0	0,00	461	65,86	239	34,14	700	100
2003	2	0,25	534	67,42	256	32,32	792	100
2004	0	0,00	453	63,45	261	36,55	714	100
2005	2	0,24	528	64,47	289	35,29	819	100
2006	1	0,15	397	59,08	274	40,77	672	100
2007	0	0,00	384	55,65	306	44,35	690	100
2008	0	0,00	404	57,30	301	42,70	705	100

Source: SINAN   I/W: Ignored and white   PB: Paucibacillary   MB: Multibacillary

es and psychological trauma. These disabilities have been responsible for the stigma and discrimination of patients. One of the most effective ways to assess whether the diagnosis of leprosy has been occurring early is to identify the presence of physical disability at diagnosis. That is, the higher the proportion and the intensity of the patient's disability at diagnosis, the later the detection of the disease shows to be.

Graph 2 shows that the proportion of grade 2 disability at diagnosis had a decrease early in the series, being followed by a steady increase, confirming late detection of leprosy in the city of Teresina. Concerning grade 2 disability at discharge, there was a decrease in this index, which was below 5% in 2008, showing an improvement in the quality of prevention among diagnosed patients.

Currently, Brazil comprehends more than 80% of the cases of leprosy in the Americas, with a prevalence of 2.6 per 10,000 inhabitants, more than 40,000 new cases detected each year, being the only country considered endemic in the Americas. By definition, this prevalence indicator lists the number of patients registered for specific treatment on a certain day of the year (December 31). However, it is important to emphasize that the use of this prevalence rate as indicator of leprosy elimination is still discussed among the authors. Due to the introduction of multidrug therapy of short duration (maximum of 2 years) on a large scale, there was a drastic reduction in the prevalence of leprosy, causing a decline in global prevalence, approaching the elimination goal. [2] In Teresina,

the high percentage of such cases during the time of the study reinforces the endemicity of the area.

Variation in the percentage of diagnosis of the clinical form of cases T to L and PB to MB is a favorable indicator of control, suggesting that there are fewer circulating bacilli.

CONCLUSION

The city of Teresina, in spite of having a coverage of 80% of the population with teams of the Family Health Strategy - which develop actions for the Leprosy Control Programme - the indicators of control of this disease, such as the detection rate of new cases, the detection of new cases in children under 15 years old and prevalence are quite high, causing the city to be classified as hyperendemic, according to the criteria of the Ministry of Health. In addition to this, we observe an epidemiological profile characterized by higher incidence of multibacillary cases, with a slight predominance in females.

The high proportion of cases with grade 2 disability at diagnosis indicates the need for improved early detection, and shows that leprosy can lead people at working age to inactivity.

The data presented highlight the need to intensify control activities such as active search through contact examinations to improve early diagnosis, recommended by the Ministry of Health. The influence of socio-cultural factors in maintaining this disease must also be considered.   ❑

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