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Original Article

Leprosy among children and adolescents under 15 years-old in a city of Legal Amazon, Brazil

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Background and objectives: Leprosy is yet an important infectious disease in Brazil. The objective of this study was to determine the frequency of leprosy among children and adolescents in a countryside city from Legal Amazon region. *Results:* there was a high frequency of Hansen's disease among children from 5 to 9 years-old, predominantly females, with multibacillary form, and dimorphous types. *Conclusion*: due to late diagnosis and higher frequency of treatment abandonment leprosy is a serious public health problem among children and adolescents is this small city.

Keywords : multibacillary leprosy; borderline

Introduction

In 2010, 192246 cases of leprosy were reported world-wide[1]. India accounts for 64% of new leprosy cases, followed by Brazil, Indonesia, Democratic Republic of Congo, Ethiopia, Nigeria, Bangladesh, Nepal, Myanmar and Sudan (WHO 2011, Margoles et al 2011). Leprosy induces feet deformities and amputation of toes which have been associated with decreased walking capacity; and it has been estimated that two million people worldwide are disabled due to leprosy (Slim et al 2011, Nsagha et al 2011). From 210 patients enrolled for treatment in a leprosy reference center in rural Ehiopia, 61.5% had developed some type of disability (Ramos et al 2011).

In a global scenario of immigrations of the poorest populations, children and adolescent leprosy patients are driven to non-endemic nations such as France. Then, the WHO global strategy of leprosy elimination seems to be difficult to be achieved and leprosy remains an important disease burden for both children and adults in Asian, African, and Latin American populations.

According to a recent study (Penna et al 2009), there are ten most probable clusters of leprosy in Brazil. The second most important cluster

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regarding relative number of cases and detection rates is represented by the *Mato Grosso* State (Penna et al 2009).

For the first time, we report here the epidemiologic profile of leprosy among children and adolescents under 15 years-old in the urban area of a countryside city from Legal Amazon, *Mato Grosso* State, Brazil.

Methodology

This was an epidemiologic study covering leprosy epidemiological data from 2001 to 2010 in Barra do Garças municipality (15° 53′ 24″ S, 52° 15′ 24″ W), Mato Grosso State, Legal Amazon, Brazil. Barra do Garças has a population of 56423 citizens. Data were obtained by using the national system of registering of disease notifications (SINAM) in the regional reference office of the municipality. According to current recommendations of the Brazilian Ministry of Health we collected data and estimated the detection coefficient among those under 15 years-old; the leprosy clinical forms according to Madrid's classification in indeterminate (i), tuberculoid (t), wirchownian (w), and dimorphous (d); percent of cases diagnosed by baciloscopy; percent of cases of paucibacillary and multibacillary leprosy. All patients signed the free and informed consent form and the study received approval by the Ethics Committee on Research of the Julio Müller University Hospital (protocol 987/CEP-HUJM/2011). Epiinfo® 3.5.3. was used for statistical analysis. The chi-square test was used to verify possible differences among the results, with a significance level of $p<0.05$.

Results

The studied population comprised 77 patients with predominance of female gender (54.5%). The higher frequency of leprosy cases were found at the age of 5 to 9 years-old (54.54%) and at 10 to 14 years-old (44.15%). Table 1 shows the leprosy cases under 15 years-old according to operational classification (paucibacillary and multibacillary).

Table 1 : Frequency and prevalence of leprosy (number of cases per 10000) in patients under 15 years-old according to operational classification in Barra do Garças, Brazil – 2001 to 2010.

Operational Classification	Age (years-old) 1 to 4	5 to 9	10 to 14	Total	%
Paucibacillary	1(2.08)	19(35.61)	13(24.07)	33(21.22)	42.9
Multibacillary	0(0.0)	23(43.1)	21(38.88)	44(28.3)	57.1
Total	1(2.08)	42(78.71)	34(62.95)	77(49.52)	100.0

Table 2 : Clinical forms of leprosy in children and adolescents under 15 years-old in Barra do Garças, Brazil – 2001 to 2010

Clinical form	Age (years) 1 to 4	5 to 9	10 to 14	Total	%
indeterminate	0	11	5	16	20.78
tuberculoid	1	6	7	14	18.18
dimorphous	0	22	19	41	53.24
virchowian	0	0	2	2	2.60
non-classified	0	2	2	4	5.20
Total	1	41	35	77	100.0

Table 3 : Causes of leprosy patients discharge under 15 years-old in Barra do Garças, Brazil – 2001 to 2010.

Cause	Age (years-old) 1 a 4	5 a 9	10 a 14	Total	%
Cure	0	34	25	59	76.62
Abandonment	0	3	3	6	7.79
Error	1	2	0	3	3.90
Transference	0	2	1	3	3.90
Non-informed	0	5	1	6	7.79
Total	1	46	30	77	100.0

The most frequent leprosy forms were dimorphous (55.4%), indeterminate (21.6%), tuberculoid (18.9%) and the remaining was virchowian or non-classified form (4.1%) (Table 2).

Although 3.9% of baciloscopies were negative, 94.8% of the population was not subjected to baciloscopy examination.

Only 77% of leprosy children and adolescents were considered cured with a high frequency of treatment abandonment (about 8%) and missing information (Table 3).

The detection coefficient was 2.22/10.000 hab which was considered an endemic area.

Leprosy annual incidence is represented in figure 1.

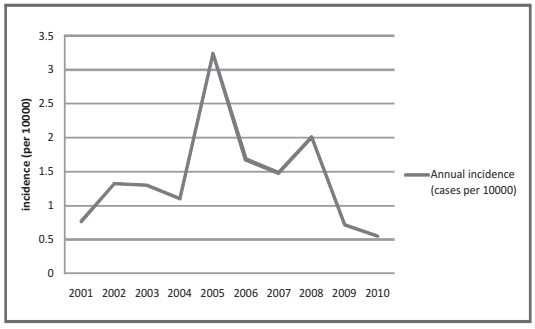

Fig. 1 : Incidence of leprosy among children under 15 years in Barra do Garças, MT, Brazil (2001-2010).

Discussion

Beyond the physical impairments, leprosy also causes social discrimination due to the very foreseeable and transmissible skin lesions (Esfandbod 2011, de Groot et al 2011).

The indeterminate form is the initial clinical manifestation of Hansen's disease that could progress to either spontaneous cure or to other clinical forms (Imbiriba et al 2008). In the present study the percent of indeterminate form was lower than the polarized forms suggesting that the clinical diagnosis has been realized later. In a study covering leprosy cases from 2000 to 2006 in Uberaba, Southern Brazil, it was reported 9 cases of leprosy in children of which six were dimorphous; and those authors concluded leprosy diagnosis was very late in children (Miranzi et al 2010). In this study, 41 cases of leprosy were dimorphous which constitute a serious public health problem since this form is multibacillary with a high bacillary load. Notwithstanding this clinical form usually affect eyeball, larynges, spleen, liver, adrenal glands, lymph nodes, peripheral vascular system, testis, and peripheral nerves (Pontes and Neto 2005, Lima et al 2009).

In this study the multibacillary cases were predominant (57.1%) which revealed a different pattern of the country's profile where 40.88%

of cases are multibacillary (WHO 2011). Then, the Barra do Garças could be considered hyperendemic since the multibacillary leprosy in children was very higher than other Brazilian localities such as Piaui (Costa and Oliveira 2009). In fact, the micro-region of "Medio Araguaia", on which Barra do Garças is located, is considered the 8th highest leprosy endemic area with both ancient and newer leprosy focus (Santos et al 2010). Among Legal Amazon states, Mato Grosso has a higher prevalence and incidence of leprosy which has been associated to recent population migratory flows, poverty, poor living conditions, alcohol abuse, abandonment of treatment, and lack of disease knowledge (Santos et al 2010, Ferreira et al 2011).

Although leprosy incidence among children under 15 years has been declining since 2005, the disease continues to be a public health problem since 23.38% of cases are not cured. This study is in agreement with other reports in which Mato Grosso state accounted for the 2nd higher detection coefficient of leprosy among children under 15 years in Brazil (BMS 2008).

This study supports the concept that leprosy control programs should be more effective in Brazil (Barreto et al 2011), sub-Saharan Africa (Macassa et al 2011), as well as in India as recently reported by Kumar et al (2011) and Horo et al (2010). The presence of precocious leprosy cases observed in this study is a serious endemic public health problem similarly to previous findings in West Bengal, India (Horo et al 2010).

Conclusion

In this small city leprosy is a public health problem which deserves more attention of the health authorities concerning earlier diagnosis and more effective treatment as recommended by the WHO.

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