

# Report of three new leprosy cases in children under fifteen in the municipality of Itaguaí, Rio de Janeiro - event alert for epidemiological investigation \*

Relato de três casos novos de hanseníase em menores de quinze anos no município de Itaguaí, Rio de Janeiro - evento de alerta para investigação epidemiológica

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**Abstract:** Leprosy is an infectious disease with an average incubation period of two to five years. It is caused by *Mycobacterium leprae*, mainly affecting skin, mucous membranes and peripheral nerves. When it occurs in children under fifteen, it reflects an intense and long contact period, with a high bacillary load. Therefore, it is considered an important alert sign that points to the challenge of controlling the disease. The authors report three cases of leprosy in children under fifteen that occurred in the Itaguaí district, Rio de Janeiro. The epidemiologic implications of new cases detected at this age and the fundamental role of examining the patients' close contacts and the possible identification of source cases as an effort for leprosy control are discussed.

Keywords: Child; Epidemiology; Leprosy

**Resumo:** A hanseníase é uma doença infectocontagiosa, com período de incubação médio de dois a cinco anos, causada pelo *Mycobacterium leprae*, o qual possui tropismo para a pele, as mucosas e os nervos periféricos. Quando manifestada em crianças abaixo de quinze anos, reflete a intensidade e longo período de exposição à grande carga bacilar. Representa, então, um importante evento de alerta que aponta para uma dificuldade no controle da doença. Os autores relatam três casos de hanseníase, em menores de quinze anos, provenientes do Município de Itaguaí, Rio de Janeiro. Discutem-se as implicações epidemiológicas da detecção de novos casos nessa faixa etária e o papel fundamental do exame de contatos e da busca do caso fonte no controle da Hanseníase.

Palavras-chave: Criança; Epidemiologia; Hanseníase

## INTRODUCTION

Hansen's Disease, hansenosis or leprosy is an infectious illness of slow evolution and great incapacitating potential.<sup>1,2,3</sup> Its agent, *Mycobacterium leprae* or Hansen's bacillus was discovered by Hansen in Norway, in 1873, but the first records mentioning hansenosis were written between 400 and 600 B.C., in India.<sup>3,4</sup>

The incubation period varies from 06 months to 21 years. The upper airways are considered the main transmission route and primary entry route for the bacillus into the body.<sup>1,2,3</sup> The transmission sources seem to be carriers of multibacillary forms.<sup>5</sup> Individual conditions, factors related to endemic levels and unfavorable social conditions influence the risk of becom-

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ing infected with Hansen's disease.<sup>6</sup> As it is a highly infectious illness of low pathogenicity, most of the infected people do not become sick, revealing a protective role of innate immunity. Despite that, in endemic areas continuous exposure to the bacillus may lead to illness, even in resistant people; consequently the great number of tuberculoid leprosy cases constitute an indicator of high endemicity and of the presence of hidden transmission focuses.<sup>3,6</sup>

The intervention in the transmission chain is done through the earliest possible diagnosis, by means of active and passive detection, and treatment of sources of infection.<sup>7</sup>

Studies about historical evolution of leprosy in developed countries demonstrated a positive relationship between decline of new cases and increase of age at the onset of disease. In areas of high prevalence and detection, such as Brazil, the high number of cases in younger than fifteen years of age indicates, therefore, active and recent transmission, assisting in monitoring the endemic disease.<sup>8</sup>

## CASE REPORTS

### CASE 1

Female, black, eight-year-old patient was referred to the Sanitary Dermatology (SD) service with a hyperchromic papule located on the forehead since two years before, which evolved to plaque with elevated hyperchromic borders, measuring two centimeters in diameter and with a hypochromic center (Figure 1), during the previous year. She reported that, in the last three months, a satellite papule appeared. The physical examination revealed thermal anesthesia at the center of the lesion and absence of nervous trunks thickening, which led to clinical diagnosis of Hansen's



FIGURE 1: Eight-year-old patient - 2cm plaque with raised and hyperchromic borders and satellite papule on forehead

disease, suggesting the borderline-tuberculoid form due to the morphology of the lesion associated with the satellite papule. A physical examination of contacts was performed.<sup>2</sup> No bacilloscopy (which would be negative in this case), histopathological test or Mitsuda test were performed. In the evaluation of all seven household contacts, there was suspicion regarding the ten-year-old sister and the six-year-old cousin.

### CASE 2

The above mentioned six-year-old cousin of the patient had a hypochromic macule that progressed to hypochromic plaque one year ago, three centimeters in diameter, with microtubercula in its interior, localized on left forearm, with thermal anesthesia (Figure 2). Absence of nervous trunks thickening. She denied pruritus or desquamation.

### CASE 3

The patient's 10-year-old sister presented a 2 cm hypochromic macule, that progressed to hypochromic plaque with microtubercula on the lesion borders during the previous two years, slightly sparing the center. It is located on the left shoulder, with thermal anesthesia within the lesion (Figure 3). Absence of nervous trunks thickening. The lesion did not present desquamation or pruritus.

Cases 2 and 3 had clinical diagnosis of tuberculoid Hansen's disease and a supplementary histological test was done for documentation and counter-referral for the city of residence. No bacilloscopy nor Mitsuda tests were performed.

The histopathological tests of both contacts demonstrated the tuberculoid form of Hansen's disease (Figures 4 and 5).



FIGURE 2: Six-year-old contact (cousin) - 3cm hypochromic plaque with microtubercula in its interior on left forearm



FIGURE 3: Ten-year-old contact (sister) - hypochromic plaque with microtubercula on the border and spared center on left shoulder

## DISCUSSION

Hansen's disease, in Brazil, still presents high coefficients of detection, despite the drop in the coefficient of prevalence in the last few years. The detection rate - an indicator of disease transmissibility - of 20.56 cases/100,000 inhabitants is considered as a very high endemicity level.<sup>9</sup>

As the incubation period of leprosy is long (two to five years), its occurrence in those younger than fifteen reflects early and intense exposure to a high bacillary load that leads to illness, in spite of an apparently adequate immunity. Detection of new cases in this age bracket is, therefore, considered an event alert for active and recent transmission, pointing to

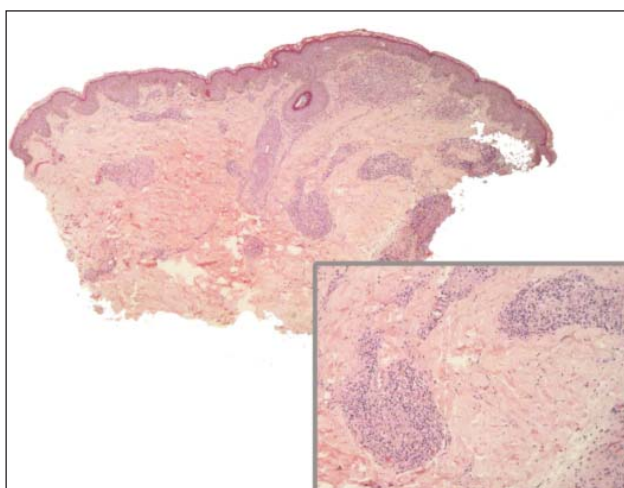


FIGURE 4: Histopathological exam - case 2 - The histopathological exam revealed well defined tuberculoid granulomas in both the superficial and the deep dermis, affecting the neurovascular bundle (H.E - 40 X). In detail, two granulomas

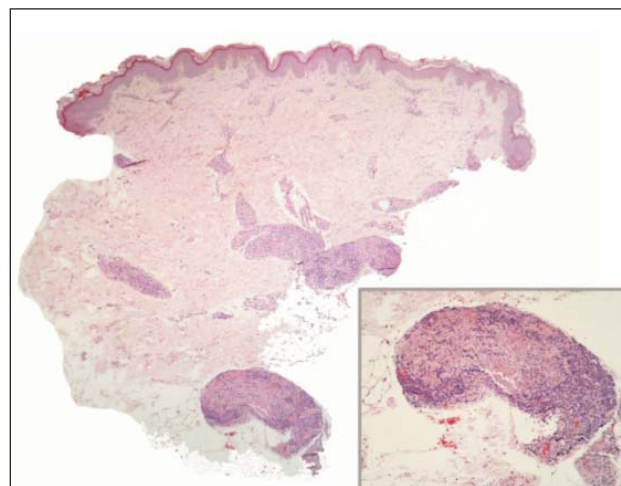


FIGURE 5: Histopathological exam - case 3 - The histopathological exam revealed a pattern similar to that of tuberculoid granulomas (H.E - 40 X). In detail, tuberculoid granuloma in neurovascular bundle in the deep reticular dermis (HE - 100 X)

the need for epidemiological surveillance activities and immediate investigation to search for the source case.<sup>7,10</sup>

In our case, this investigation, consisting of examination of the seven household contacts recorded, led to two other new cases diagnosed in children who, besides having family ties, studied in the same school. The Ministry of Health defines household contact as each and every person who resides or has resided with the Hansen's disease patient in the last five years.<sup>11</sup> It is important to emphasize that especially in cases where patients are younger than fifteen years of age, the identification of household contacts should include, in addition to family members, possible caregivers who do not necessarily live in the same house. The increased risk of illness among contacts may be related to genetic family susceptibility and the physical distance of the index case.<sup>12</sup>

Besides the examination of household contacts, other strategies that may be used are information, education and communication (IEC) activities, aiming at stimulating spontaneous demand, and examinations of the collectivity in schools, which represent active search. In this case, the city health secretariat of Itaguaí, after IEC activities and offer of dermatological-neurological examination to those with signs and symptoms, did not identify other cases in the school where the children study. The probable origin of the source patient is Minas Gerais, where the three girls had close and prolonged contact with a family member diagnosed with the multibacillary form who was identified, according to information provided by the children caregivers, due to the information on health education and communication transmitted to family

**TABLE 1:** New cases, coefficient of detection and population of minors under 15 years of age - município de Itaguaí, RJ - 2001 a 2007

Data of Itaguaí	2001	2002	2003	2004	2005	2006	2007	SD
New cases <15 anos	1	2	4	6	2	3	4	3
Population <15 anos	24.552	25.046	25.577	26.105	27.307	27.915	28.520	29.200
Coefficient of detention <15 anos	4,07	7,99	15,64	22,98	7,32	10,75	14,03	10,30

Source: U.S. and SINAN Leprosy Leprosy Management - RJ-SESDEC / SD = Sanitary Dermatology

members during the examination of contacts. Therefore, contagion was probably the result of a migratory movement. In such situations, the investigation becomes even more complex and, besides the knowledge about the geographic distribution of Hansen's disease, we should take into account the population flows that may be responsible for the onset of new cases outside the epidemiological context of the area of residence.<sup>13</sup>

In the new World Health Organization (WHO)'s global strategic plan for control of Hansen's disease 2011 - 2015, the detection of new cases in patients younger than fifteen years of age is an important indicator, having already been elected by the Ministry of Health (MH) as endemic monitoring indicator since 2007.<sup>14,15</sup> WHO recommends diagnostic validation of new cases on a routine basis, an activity that the Ministry of Health has been carrying out and encouraging, mainly in this age bracket, considered by many of difficult diagnosis when made merely on clinical basis by the basic health units.<sup>14,16</sup> This sanitary dermatology health unit (SD), a state leprosy reference, con-

tributes to the diagnosis and validation, as described in the cases above.

According to Decree n° 125/2009 of MH, the coefficient of detection in patients younger than 15 years of age is considered hyperendemic when presenting a value higher than 10 per 100,000 inhabitants. The city of Itaguaí presented a population of 29,200 inhabitants in 2008, year when the three new cases here reported were detected (Table 1).<sup>7</sup>

Our conclusion is, therefore, that the detection of only three new cases raises the coefficient of detection in patients younger than 15 years of age, in the above mentioned municipality, to a value considered as hyperendemic (Table 1). This fact alerts us to the need to increase surveillance activities in this area, both for resident and imported cases. The report here presented illustrates and emphasizes the importance of a reference unit in the diagnosis of cases in this age bracket and points to the need for identification of contagion sources in the context of epidemiological surveillance, in an attempt to control Hansen's disease. □

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