Major Article

Leprosy and pregnancy in the State of Pará: an epidemiological perspective

Vera Regina da Cunha Menezes Palácios[1]*, Cléa Nazaré Carneiro Bichara*[1]*,*
Jarbas Barbosa da Silva Junior[2]*, Rodrigo da Silva Dias*[3]
and Nelson Veiga Gonçalves[4],[5]

[1]. Departamento de Saúde Comunitária, Universidade do Estado do Pará, Belém, PA. [2]. Secretaria de Vigilância em Saúde, Ministério da Saúde, Brasília, DF. [3]. Departamento de Saúde Comunitária, Universidade do Estado do Pará, Belém, PA. [4]. Laboratório de Geoprocessamento, Universidade do Estado do Pará, Belém, PA. [5]. Programa de Pós Graduação em Virologia, Instituto Evandro Chagas, Ananindeua, PA.

ABSTRACT

Introduction: A few older publications describe leprosy associated with pregnancy, a situation that has been linked to leprosy exacerbation. This study aimed to describe the detection rate of this association in the State of Pará by county and Integration Region (IR) from 2007 to 2009 via an analysis of sociodemographic, epidemiological and operational indices. **Methods:** This was a descriptive study using information generated by the SINAN. The Detection Coefficient of the Leprosy and Pregnancy Association (DCLP) epidemiological index was constructed to help interpret the endemicity parameters. The disease was considered hyperendemic when greater than two cases per 10,000 inhabitants were identified. **Results:** During the study period, 149 associations were detected, with 14 hyperendemic counties: seven in 2007, five in 2008 and two in 2009. The Carajás Integrated Region displayed the highest DCLP index in the period. Eldorado dos Carajás had the single highest DCLP index (5.7/10,000 inhabitants, 2008), whereas the DCLP index in Conceição do Araguaia was very high in all three years. However, most counties displayed low or medium DCLP indices. The annual averages were 0.31 DCLP (2007), bass; 0.30 (2008), bass and 0.19 (2009), bass. The average DCLP index was 0.26, which is considered low. Three clusters of medium endemicity were identified by the average DCLP in the study period. **Conclusions:** The analyses indicated that the surveillance program is still unsatisfactory in Pará. The interpretation of the endemicity parameters enabled qualitative and quantitative analyses to determine the epidemiological panorama of this association. The identification of high endemicity requires further clarification.

Keywords: Leprosy. Pregnancy. Epidemiology.

INTRODUCTION

Leprosy is a disease caused by *Mycobacterium leprae* and curable with multidrug therapy (MDT)[1]. Numerous studies on the transmission, clinical presentation and prognosis of leprosy corroborate the now indisputable relevance of the socioeconomic and cultural changes in the disease's epidemiological profile[2-4]. The association of unfavorable socioeconomic and cultural factors with disease sequelae demonstrates the vulnerability of the affected population, who lose quality of life because the current public health treatment options do not yet permit the reversibility of the leprosy stigma[5].

In Brazil, although the detection rates are declining steadily, year by year, the northern region still remains as the most endemic, both in terms of general leprosy indices and cases associated with pregnancy[6].

Leprosy control relies on detailed and accurate information to support the plan and design of intervention strategies. The implementation of the Notifiable Diseases Information System (SINAN) occurred heterogeneously in the Brazilian states, and a software-based system for the SINAN was not implemented until 1998[7].

The National Plan for the Elimination of Leprosy (PNEH) is a priority of the Health Pact of 2006 and currently relies on the *new cases detection index*, which replaced the *punctual prevalence index*[8]. Due to the vast Brazilian territory, leprosy is heterogeneously distributed in the country. Whereas the leprosy prevalence is below one case per 10,000 inhabitants in the south, in several states of the northern, northeastern and center-western regions, leprosy reaches hyperendemic detection coefficients (DC). The State of Tocantins has the highest DC in Brazil[9,10].

The spatial-temporal distribution of leprosy can be visualized with coropletic and thematic maps created with geoprocessing techniques, which permits the synthesis of epidemiological relationships occurring in time and space, generating useful data on leprosy and other diseases[11].

Although the association between leprosy and pregnancy appears uncommon, the attendant complications of this relationship are not[12]. In the final gestational trimester, a depression of cellular immunity occurs, which can result

Address: Drª Vera Regina da Cunha Menezes Palácios. Travessa Rui Barbosa 619/1102, Bairro do Reduto, 66053-260 Belém, PA, Brasil.
Phone: 55 91 9983-3013
e-mail: verareginapalacios@gmail.com

in reactional states such as Lucio's phenomenon (a type II reaction); the additive effect of this reactional state to the characteristic vascular changes of pregnancy results in a higher probability of severe necrotizing vasculitis, typically in the lower limbs. In the postpartum period, a suppression of humoral immunity occurs, with intensification of rapid type I reactions, resulting in irreversible nerve necrosis[13]. The treatment of type II reactions is based on thalidomide. Use of this drug requires particular vigilance in women of childbearing age, due to its known teratogenicity[14].

Several challenges exist in adapting national and state statistics to the goal of eliminating leprosy within the time limits established by the National Plan for the Elimination of Leprosy (NPLE)[8]. These challenges include late diagnosis, patient noncompliance with the treatment and failures in the registration and notification flows. A clearer view of these problems is necessary to enable review strategies and adoption measures to eliminate leprosy as a public health problem. The gravity of leprosy and its disruptive sequelae render essential an exploration and analysis of the factors behind pregnancy and leprosy in the State of Pará[15]. More than sixty years ago, Ryrie wrote that among the comorbidities during pregnancy, leprosy might be one of the few systemic diseases for which the interaction is unilateral. Leprosy does not appear to have an effect on pregnancy development, but the characteristic immune, hormonal and metabolic alterations of pregnancy do affect the course of leprosy[16].

Data from Duncan et al.[17] indicate a clear association between the postpartum period and the developing of neuritis. They reported patients with evident neuritis, namely decreased sensory and/or motor nerve function without pain or sensitivity[17].

The repercussions of leprosy surpass the limits of health institutions, as their resultant deformities and disability entail withdrawal from the workforce and the need for specialized technical resources carrying economic burdens, in addition to the millennia-old cultural stigma of sin and divine punishment related to the condition, which leads to social segregation and a loss of quality of life[18]. The need for data on the disease mandates a review of current epidemiological indices, which are not sufficiently clear on situations of collective risks that may explain how this disease manifests itself socially[4].

This study sought to analyze the epidemiological situation of the association between leprosy and pregnancy, describing socio-demographic variables, operational and epidemiological indices and the construction of the detection coefficient of the leprosy and pregnancy association (DCLP) to obtain the necessary interpretation parameters for this endemicity association[19].

METHODS

We chose to conduct a retrospective longitudinal and descriptive study, using documentary research through the SINAN reporting forms from 2007 to 2009, based on municipalities (*counties*) and the twelve Integration Regions (IR) of the State of Pará. Data were also collected from the State of Pará Department of Public Health (SESPA) and the Brazilian Institute of Geography and Statistics (IBGE), the Ministry of Health Surveillance System (SVS/MS) and the DATASUS (Unified Health System). Electronic Database. The study population consisted of pregnant women 12 to 49 years of age reported with a leprosy diagnosis in the three-year study period. The described variables were age, clinical presentation, education level, operational classification, number of skin lesions, input mode, number of affected nerves, type of discharge, method of case detection, bacilloscopy results, initial therapeutic regimen, number of contacts registered and reactional episodes. The described operational indices were percentage of contacts investigated, percentage of patients evaluated for disability at diagnosis, number of patients cured in the period, percentage of patients assessed for disability at healing and percentage of cases with grade II disability. An epidemiological index, the DCLP, was constructed, as well as a method for interpreting the endemicity parameters, using percentile statistical analysis.

For the contingency table statistical analysis, the G test with Williams' correction was applied, with a two-tailed p <0.05 considered statistically significant. To calculate the DCLP, the numerator is the pregnant leper total, and the denominator is the total number of women aged 12 to 49 years, multiplied by 10,000 inhabitants[19].

$$DCLP = \frac{\text{Number of pregant lepers}}{\text{Total number of women aged 12 to 49 years}} \times 10,000$$

To estimate the endemicity patterns of the leprosy-pregnancy association, all DCLP indices calculated were, from start, arranged in ascending order for the studied counties. The State of Pará has 143 counties. Considering that the study was conducted for a period of three years, we can state that 429 coefficients of detection were observed along this time. The number 84 indicates that only the positive coefficients were considered, and the zeros were not counted. Thus, out of 429 coefficients, only 84 are positive (i.e., greater than zero). After calculating the coefficients, the *percentile method* was used because there are five endemicity patterns: hyperendemic, very high, high, medium and low. **Figure 1** shows that four percentiles were used (P20, P40, P60 and P80). The DCLP values corresponding to these percentiles were then calculated. These four percentiles divide the ordered series of coefficients into five groups with an equal number of observations as previously proposed by Palacios et al.[20]. Each group corresponds to a range that characterizes the disease endemicity parameter (low, medium, high, very high and hyperendemic).

Once calculated, the DCLP values were interpreted according to the predefined parameters. Thematic and coropletic digital maps were then generated, using ArcView 3.2 software, integrated with Corel Draw, version 1.5, so as to depict the spatial distribution of the DCLP values visually.
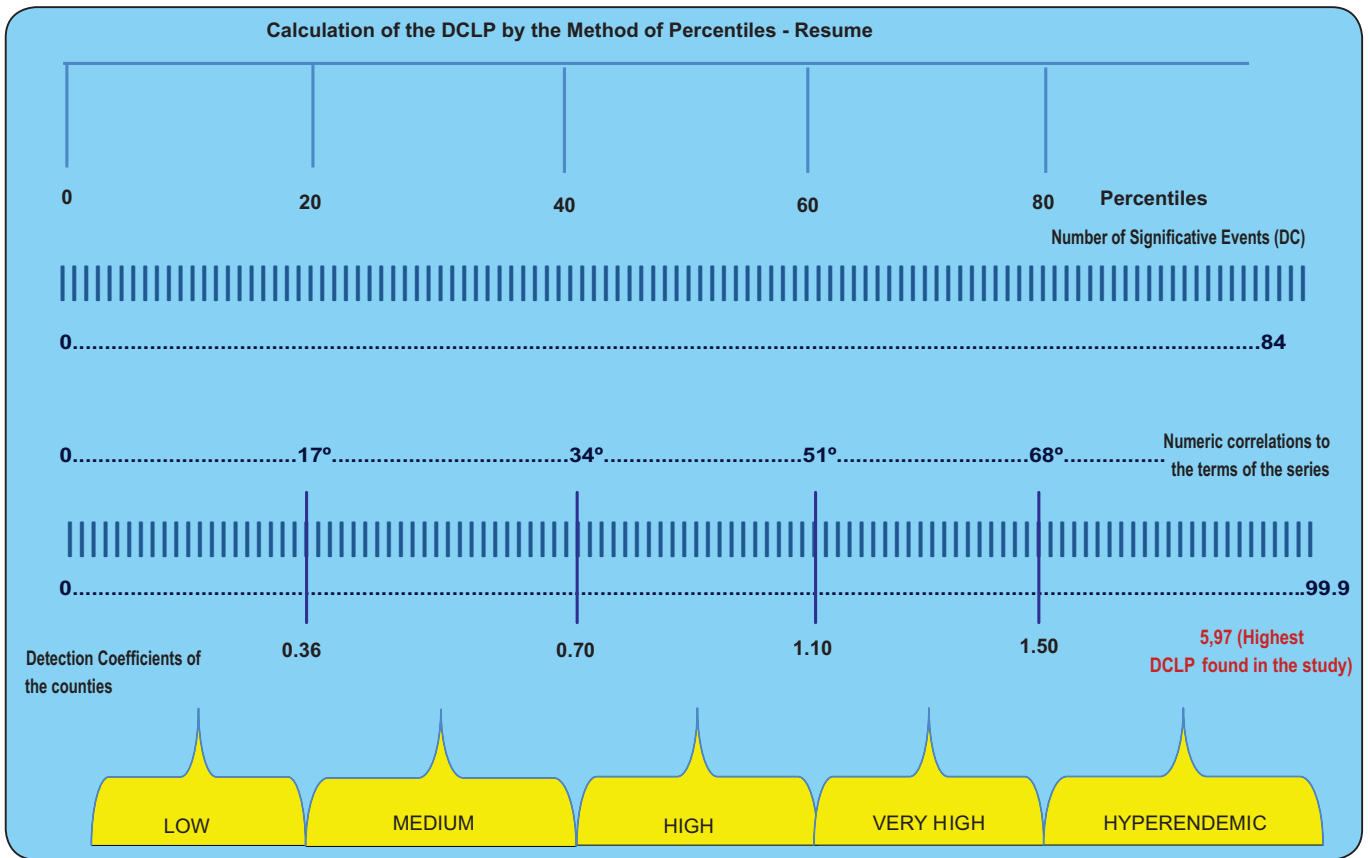
FIGURE 1 - Resume of the calculation of the parameters of endemicity of leprosy associated with pregnancy. **Source**: Palácios, 2012. DCLP: detection coefficient of the leprosy and pregnancy association.

RESULTS

Over the three study years, 149 cases of pregnant women with leprosy were reported: 57 in 2007, 47 in 2008 and 45 in 2009. The data were organized by the 143 counties of Pará in the three years of the study and then collected in the twelve IR containing their respective counties.

In this study, all p values were greater than 0.05, indicating no statistical evidence against the hypothesis that leprosy cases in pregnant women were distributed evenly among the categories of the following selected variables.

With regard to the age and race of the 149 women tallied, 104 (69%) were aged 20-39 years and 84 (56%) were members of the pardo racial classification. As for schooling, no significant predominance was identified, although most subjects had completed elementary and high school education; four were illiterate. Regarding the clinical form of the disease, 49 (32%) cases were indeterminable and 45 (30%) dimorphic. Of the 149 cases studied, 28 (18%) were unclassifiable. Regarding the operational classification, the paucibacillary form was observed in 84 (56%) cases, and the multibacillary form was observed in 65 (44%) cases. Single skin lesions appeared in 74 (49%) cases, whereas 49 (32%) cases had two to five lesions. The input mode revealed 124 (83%) new cases. Regarding the number of affected nerves, the *not informed* column was predominant,

comprising 102 (68%) of the 149 reported cases. There were 92 (61.7%) cases discharged following cure, and 21 (14.1%) patients abandoned treatment. Regarding the detection of cases, 73 (48%) pregnant women with leprosy sought health services spontaneously, followed by 34 (22%) referral cases, whereas 25 (16%) cases were registered as *ignored*. The bacilloscopy results were *ignored* in 98 (65%) cases and *unrealized* in 37 (24%) cases, meaning that 135 (90%) of the total of 149 cases were noticeable. Regarding the initial therapeutic regimen, 89 (59%) women began paucibacillary multidrug therapy (MDT/PB) and 59 (39%) were given multibacillary multidrug therapy (MDT/MB). In addition, two to five registered contacts predominated in 92 (61%) cases, whereas 30 (20%) cases registered more than five contacts. Of the total, 103 (69%) cases were reported as being *without reaction*, and 36 (24%) cases were determined to be *not reported*. In addition, seven (4%) cases with type I reactions and two cases with type II reactions were reported (**Table 1**).

The operational index percentages were recorded for the contacts investigated, the number of patients disabled at diagnosis, the number of patients cured during the study period, the number of patients disabled at disease resolution and the number of cases with grade II disability.

The DCLP annual averages were 0.31 (2007), bass; 0.30 (2008), bass and 0.19 (2009), bass. The average DCLP index was 0.26, which is considered low. **Figure 2** demonstrates the spatial distribution of the concordant cases of leprosy and pregnancy in the State of Pará during the study period.

TABLE 1 - Results framework for the distribution of cases according to the categories of the selected variables, from 2007 to 2009 in the State of Pará, Brazil.

Variable	2007-2009 Total: 149 cases		Variable	2007-2009 Total: 149 cases
Age group p = 0.7832	- 104 cases of 20 to 39 years - 28 cases 15-19 years - 13 cases over 40 years - 4 cases 12-14 years		Type of discharge p = 1.000	- Following cure: 92 (61.7%) cases - Transfer to/elsewhere: 16 (10.8%) cases - Death: 1 (0.7%) cases - Abandonment: 21 (14.1%) cases - Error in diagnosis: 4 (2.7%) cases - Blank: 15 (10%) cases
Race p = 0.611	- 84 browns - 18 white - 7 yellow	- 24 blacks - 3 indigenous - 13 Ignored	Mode of case detection p = 0.987	- Referral: 34 cases - Demand spontaneous: 73 cases - Active search: 4 cases - Examination of contacts: 10 cases - Ignored: 28 cases
Education p = 1.000	- Illiterate: 4 - 5° to 8° series: 48 - Higher education: 0	- 1st to 4th grade: 44 - High school: 22 - Ignored: 31	Schema therapy home p = 0.998	- PQT/PB/6 months: 89 cases - PQT/MB/12 months: 59 cases - MDT (multidrug therapy)
Shape clinical p = 0.709	- Undetermined: 49 - Tuberculoid: 19 - Borderline: 45 - Lepromatous: 8 - Not Ranked: 28		Reactions p = 1.000	- Type I: 7 patients - Type II: 2 cases - Type I and II: 1 cases - No reaction: 103 cases - Do not Know: 36 cases
Operational rating P= 0,068	- PB: 84 cases. - MB: 65 cases.		Smear p = 0,760	- Positive: 3 cases - Negative: 11 cases - Not performed: 37 cases - Ignored: 98 cases
Cutaneous lesions p = 0.999	- 1 injury: 79 cases - 2-5 lesions: 49 cases - > 5 lesions: 20 cases - Do not Know: 1 cases		Registered contacts p = 0.969	- 0 contacts: 6 cases - 1 contact: 19 cases - 2 to 5 contacts: 92 cases - 5 > contacts: 30 cases - Not reported: 2 cases
Input mode p = 1.000	- New case: 124 cases - Transfer. other county: 9 cases - Transfer. other state: 4 cases - Relapse: 2 cases - Other/ignored: 10 cases		AIF	- Number of AIF in diagnosis: 128 (85.9%) cases (parameter set) - Number of patients cured in period: 92 cases - Number of AIF at the time of curing: 67 cases - Cases with grade II disability: 8 (6.3%) cases (average parameter)
Number of affected nerves p = 1.000	- 0 nerve: 32 cases - 1 nerve: 2 cases - 2 to 5 nerves: 12 cases - > 5 nerve: 1 cases - Not reported: 102 cases			

AIF: assessment for disability; PQT: polychemotherapy; MDT: multidrug therapy; PB: paucibacillary; MB: multibacillary; P values were calculated using the G-test for independence (Williams' correction) and were higher than 0.05. Source: Palácios, 2012.
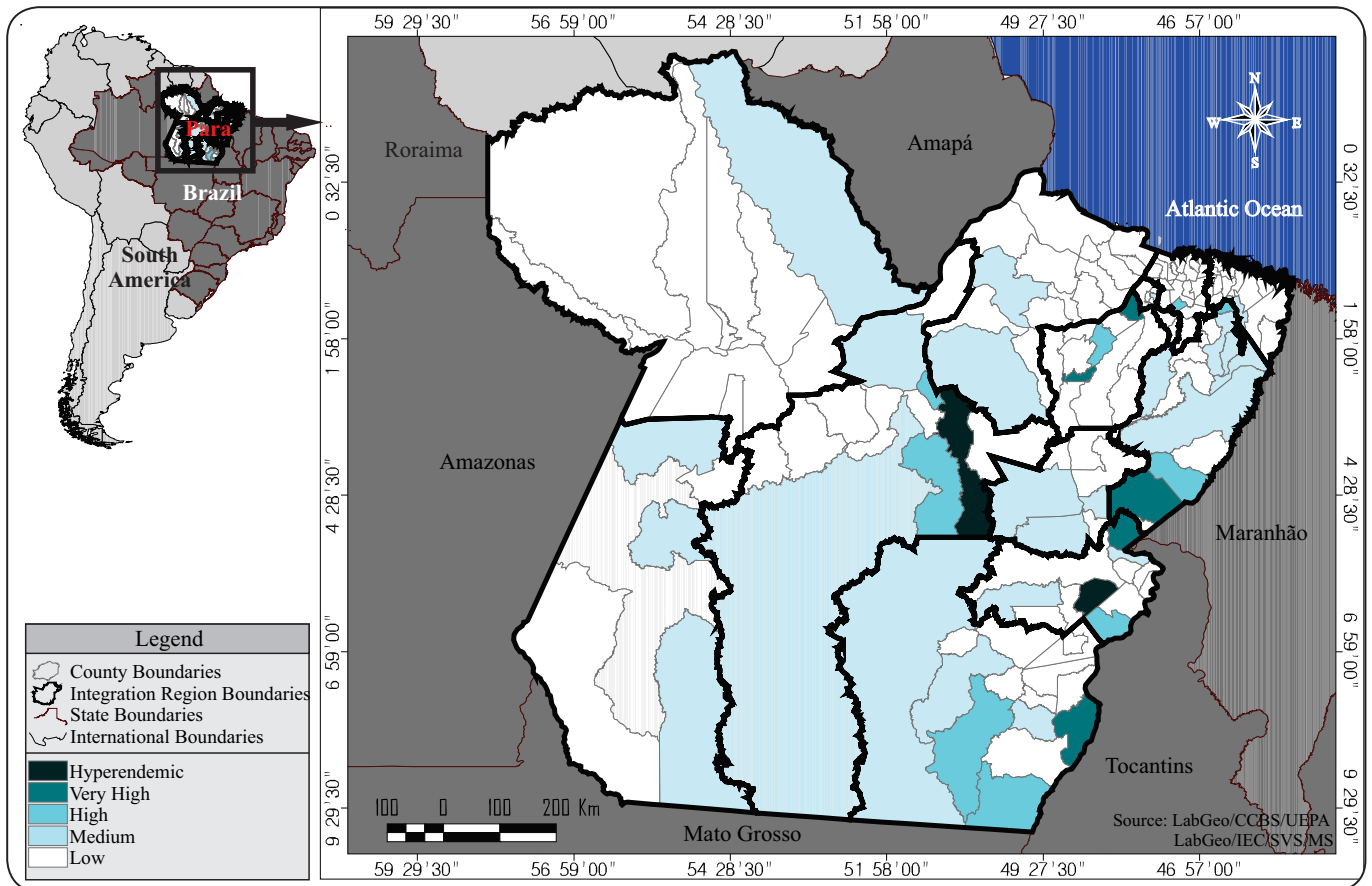
FIGURE 2 - Coefficients of detection by county of notification, State of Pará, from 2007 to 2009. Source: LabGeo/CCBS/UEPA and LabGeo IEC/SVS/MS.

Reductions in the endemic DCLP indices were noted from over the three-year period. Namely, from 2007 to 2008, several counties were hyperendemic: two counties in the Tocantins IR, two in the Carajás IR, one in the Capim IR and two counties in the Xingu IR. In contrast, from 2008 to 2009, no county demonstrated a hyperendemic pattern, but six counties had a very high endemicity pattern: one in the Xingu IR, two in the Capim IR, two in the Araguaia IR and one in the Lago de Tucuruí IR. No county remained hyperendemic for two consecutive years, but Conceição do Araguaia (Araguaia IR) displayed a very high standard endemicity for all three years of the study. Eldorado dos Carajás (Carajás IR) and Anapu (Xingu IR) were the counties with the highest overall average DCLP indices over the three-years study period, and Eldorado dos Carajás had the highest single DC index of the study, with 5.97 cases per 10,000 inhabitants in 2008 (**Table 2**).

DISCUSSION

According to Veiga[21], health analysis incorporates technologies from other fields of knowledge that apply to environmental and socioeconomic issues. Thus, a higher density of cases of the pregnancy-leprosy association was noticed in the Xingu, Araguaia, Carajás, Lago de Tucuruí, Capim and Marajó IR. Except for Marajó, the counties mentioned are notable for having concurrent economic development projects such as mining and hydroelectric power dams, in addition to intensified industry and agriculture sectors[22]. The aforementioned projects have been attracting large migrant populations, which contribute to the epidemiological context of leprosy, given the prevalence of unplanned urbanization that results in poverty belts and their sequelae. Among the maladies associated with unplanned urban settlements are malnutrition, lack of disease immunity and insufficient living conditions, such as a lack of basic sanitation, housing and food, all of which favor the hidden prevalence and transmission of disease.

Focusing on the mean values over the three-year study, we identified some clusters of medium endemicity encompassing the Tapajós, Xingu, Araguaia, Carajás, Lago de Tucuruí, Baixo Amazonas, Marajó, Capim and Caetés Integration Regions. Tapajós, for example, is a poor region with the lowest Gross Domestic Product (GDP) of the state, in addition to poor access to education and health. The Xingu IR has been experiencing economic growth and the installation of large projects such as the Belo Monte Dam, which has been attracting people from other areas, generating unplanned urbanization and settlements in the peripheries, along with public insecurity and increasing health problems, particularly contagious diseases. The Araguaia IR has solid economic sectors – such as farming, agrobusinesses and temporary crops – that permanently attract new settlers. The Lago de Tucuruí IR also has projects such as the Tucuruí

TABLE 2 - The highest Detection Coefficient of the Leprosy and Pregnancy Association by county, State of Pará, from 2007 to 2009.

County	DCLP	Parameter	Year	IR
Eldorado dos Carajás	5.97	hyperendemic	2008	Carajás
Anapu	5.29	hyperendemic	2008	Xingu
Bom Jesus do Tocantins	5.03	hyperendemic	2007	Carajás
Barcarena	4.58	hyperendemic	2007	Tocantins
Inhangapi	3.56	hyperendemic	2009	Guamá
Senador José Porfírio	3.49	hyperendemic	2007	Xingu
Rondon do Pará	3.43	hyperendemic	2007	Capim
Mocajuba	3.36	hyperendemic	2007	Tocantins
Cumaru do Norte	2.90	hyperendemic	2008	Araguaia
Igarapé-Miri	2.50	hyperendemic	2009	Tocantins
Piçarra	2.49	hyperendemic	2007	Piçarra
Ourém	2.33	hyperendemic	2008	Capim
Almeirim	2.20	hyperendemic	2008	Baixo Amazonas
Trairão	2.01	hyperendemic	2007	Tapajós
São João do Araguaia	1.99	very high	2007	Carajás
Santa Luzia do Pará	1.98	very high	2008	Caetés
Aveiro	1.94	very high	2008	Tapajós
Itupiranga	1.77	very high	2009	Lago de Tucuruí
Novo Progresso	1.73	very high	2007	Tapajós
Dom Eliseu	1.68	very high	2009	Dom Eliseu

DCLP: detection coefficient of the leprosy and pregnancy association; IR: integration region. Source: Palácios, 2012.

hydroelectric power dam. The Capim IR has been experiencing rapid but disorderly economic growth starting with the construction of the Belém-Brasília highway and federal project funding, resulting in large areas of deforestation and, finally, human settlements[22]. These characteristics together generate an epidemiological scenario favoring contagious diseases, such as leprosy, in which humans[4] are both the transmitter and the reservoir.

Barcarena (Tocantins IR) was the county with the highest number of cases in the study period (13 of 149 cases). This IR includes the State of Pará, with the third largest GDP, with Barcarena contributing 67.2% of the GDP in the said region. Approximately 10% of the state population lives in this area of Pará, due to job opportunities brought about by the industry sectors of aluminum production and processing and the production of conducting cables (main), according to data from the State of Pará Department of Planning, Budgeting and Financing (SEPOF)[22]. These factors favor human settlements and the formation of impoverished areas **(Figure 2).**

The age group found to have the highest incidence of the pregnancy-leprosy association was the *20- to 39-year-old* age group, which includes workers with the most intense professional activity levels. The interpersonal contact promoted by professional activities is one of the main means of transmitting leprosy[4], particularly when associated with pregnancy. In this study, 2.7% of the patients were younger than 15 years of age, which in the WHO view indicates that the disease detection rate in this age group still displays secular trends and recent transmission[4,23].

As for the patients' racial background, *Pardo* (various shades of racially mixed individuals with some African ancestry) predominated among the patients in this study, but this finding does not yet allow the conclusion that race influences disease occurrence, as 69.5% of the population of Pará is *Pardo*[6]. These results concur with the findings of previous studies[24].

Regarding the clinical form, the most prevalent form was *indeterminable* (32.89%), followed by *dimorphic* (30.2%). What is surprising about the *dimorphic* form is its multifaceted presentation that requires that the diagnosis be made by a specialist, but as any individual can notify health authority about cases, numerous misconceptions can result in under- or over-notification. The dimorphic MB form is considered of higher transmission potential. These results thus confirm the view of pregnancy as a worsening or triggering factor for leprosy[13,25]. These findings contradict the literature when compared with general leprosy, where 59% of cases are multibacillary, at the expense of virchowians[4]. The presence of cases with *ignored* or *non-informed* operational classification (18.8%) allow

the inference that the professionals responsible for diagnosis and reporting lack certainty in classifying the clinical form[4]. Regarding the number of skin lesions, patients with a single lesion (74 [56.4%] cases) predominated, followed by patients with two to five lesions (49 cases), a distribution that conflicts with the incidence of MB forms identified clinically, indicating that the operational classification can lead to the misdiagnosis of clinical multibacillary disease as paucibacillary.

Most cases had no nerve damage, or the notification forms contained no information on this aspect (68.5%). This percentage precludes an accurate assessment of nerve damage and reiterates the need for more qualified personnel to fill out the reporting forms[6,23]. Moreover, it is clear from the data that a dermatoneurologic examination is not part of prenatal care, even in endemic regions such as the Brazilian north, northeast and center-western areas.

The majority of cases reported during the study period were *new cases* (83.2%), which, compared to *discharged following cure*, accounting for 61.7% of cases, points to a worrying situation of treatment failure. The number of abandoned treatments deserves attention (14.1%). According to the Brazilian Ministry of Health[26], the cure rate is one of the disease control indices, with the parameters used: good (>90%), regular (75 to 89%) and precarious (<75%). Discharges following cure involving leprosy associated with pregnancy in the State of Pará are classified under the *precarious* parameter. The Caetés and Xingu IRs were classified as *good* in this regard, whereas the Baixo Amazonas and Tapajós IRs were found to fall into the *regular* category. The other IRs were classified as *precarious*.

The disease was mainly detected by *spontaneous demand* (48.99%) for treatment. It is known that women are more concerned about their appearance, and the appearance of lesions bothers them more than it does men, a factor that favors their seeking out of health facilities[4].

Concerning the results of lymphatic bacilloscopy, the finding that 65.8% of cases fit the classification *ignored* – added to the 24.8% of cases classified as *unrealized* – renders the related information for more than 90% of the cases inconclusive. This exam is important in monitoring the disorder because it can aid in defining the operational form[27], and not performing the exam certainly harms the definition of a reliable profile of the association under study.

Most individuals reported two to five contacts (78.5%), similar to the numbers of general leprosy (73.1%)[6]. According to Santos[24], the risk of developing the disease is 5 to 10 times higher if a family member has already manifested the disease, so periodic examinations of contacts are necessary because only a small number of cases are detected when examined at the time of the diagnosis of the index case **(Table 1).**

In pregnancy, due to the higher cellular immunity depression in the final trimester, if leprosy is present, the risk of leprosy reactions appearing is higher, especially the type II reactions (i.e., Lucio's phenomenon). In the postpartum period, humoral immunity is depressed, and the swift onset of type I reactions is predominant, resulting in irreversible nerve damage[13,25].

In this study, there were no reports of any such reactions, which is contrary to previously published data[13,25]; the absence of such information was observed in 24.2% of cases.

Regarding the assessment of patients for the presence of physical disability at the time of diagnosis and cure in this study, according to the Ministry of Health parameters[26], the State of Pará displayed worsened performance from time of diagnosis to the time of cure, falling from the *regular* to the *precarious* parameter, except for the Guamá and Baixo Amazonas IRs, which increased from the *regular* to the *good* parameter. These results denote delayed diagnosis or the negative influence of pregnancy on the evolution of the disease. In reference to the occurrence of grade II disability at diagnosis, Pará was ranked as *medium*, and the Araguaia, Capim and Tapajós IRs were classified as *high*. The presence of grade II disability at diagnosis is an indicator of the late detection of the association, and therefore, the high rates found in some IRs suggest the failure of surveillance measures, pointing to delayed diagnosis and contributing to an increasing number of cases of concomitant leprosy and pregnancy in the State of Pará.

In conclusion, the construction of an index for the qualitative and quantitative analysis of the leprosy-pregnancy association was useful because it made it possible the generation of an epidemiological overview of said association in the State of Pará. The highest density of the association occurrence, as well as of general leprosy, occurred in areas with active economic growth and/or implementation of major projects, thus confirming the onerous socioeconomic burden of this disease, with or without pregnancy. The same can be inferred about the most prevalent age group, found to be the more economically and professionally active. The discrepancy seen between the operational classification and the clinical form suggests that the operational classification can lead to a misdiagnosis of clinical multibacillary disease as paucibacillary disease, which can then also lead to mishandling of the associated cases.

Better professional training is imperative to minimize surveillance and treatment difficulties, some found in this study, which added to the unsatisfactory results of the epidemiological and operational indices, thus suggesting that the surveillance measures require adjustments. Because we are discussing an association between a disease and a physiological state such as pregnancy – and taking into consideration that northern Brazil is the most endemic region of the Americas, followed by the Brazilian northeast and center-west – a mandatory clinical dermatological examination in prenatal care would be useful, especially in those regions, as the clinical and epidemiological examination is the gold standard for the diagnosis of leprosy. Last but not least, it is essential to conduct more studies on this association because the immunological and clinical-epidemiological aspects of this peculiar interaction still require a great deal more explanation. This reality, when added to the lack of publications on the subject, indicates that this study can also serve as a reference. This research group will briefly present the DCLP indices of all Brazilian regions, by municipality, from 2009 to 2011.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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