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RESEARCH ARTICLE

# Clinical variables associated to the degree of physical disability in leprosy

# Variáveis clínicas associadas ao grau de incapacidade física na hanseníase

# Variables clínicas asociadas al grado de incapacidad física en la hanseniasis

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**Abstract**

**Introduction:** Peripheral nerve damage gives rise to physical disabilities due to leprosy, leading to social stigma and suffering. The purpose of this work was to analyze the association between clinical variables and degrees of physical disability in new cases of leprosy. **Materials and Methods:** A cross-cutting analytical study was conducted at the Leprosy Reference Unit in Pará State, Brazil. Data were retrieved from 323 medical records of patients diagnosed with leprosy between 2005 and 2014. Prevalence Ratio (PR) calculation was used to verify the strength of association between variables. **Results:** The percentage of degree 1 and 2 physical disabilities was added up to 28.1% and clinical variables associated to its rise were: being a multibacillary type (PR=7.2), having a sputum-smear positive (PR=2.0), presenting reactional episodes (PR=2.4) and having 4 or more affected nerves (PR=17.) **Discussion:** The predominance of the contagious and potentially incapacitating clinical form increases the risk of reactions and neural compromise, which leads to disability. **Conclusions:** More effective actions are required to strengthen the leprosy program in order to improve early diagnosis, reduce disability and potentiate the operating capacity of primary care.
**Key words:** Leprosy; Epidemiology; Risk Factors; Disabled Persons.

**Resumo**

**Introdução:** Os danos nos nervos periféricos contribuem para a instalação das incapacidades físicas na hanseníase, levando a estigma social e sofrimento. Objetivou-se analisar a associação entre as variáveis clínicas e os graus de incapacidade física em casos novos de hanseníase. **Materiais e Métodos:** Estudo transversal e analítico, realizado na Unidade de Referência em hanseníase do Estado do Pará-Brasil. Os dados foram obtidos em 323 prontuários de pacientes diagnosticados com hanseníase, no período de 2005-2014. Para verificar a força de associação entre as variáveis utilizou-se o cálculo da Razão de Prevalência (RP). **Resultados:** O percentual de Grau 1 e 2 de incapacidades físicas somou 28,1% e as variáveis clínicas que tiveram associação à sua instalação foram: ser multibacilar (RP=7,2); ter baciloscopia positiva (RP= 2,0); apresentar episódios reacionais (RP=2,4); e possuir 4 ou mais nervos afetados (RP=17). **Discussão:** O predomínio da forma clínica contagiosa e potencialmente incapacitante aumenta o risco de reações e comprometimento neural, levando às incapacidades. **Conclusões:** São necessárias ações mais efetivas para o diagnóstico precoce e redução das incapacidades, bem como, potencializar a capacidade operacional da atenção básica para fortalecimento das ações do programa de hanseníase.
**Palavras chave**: Hanseníase; Epidemiologia; Fatores de Risco; Pessoas com Deficiência.

**Resumen**

**Introducción:** Los daños en los nervios periféricos contribuyen a la instalación de las incapacidades físicas en la hanseniais, lo que lleva al estigma social y al sufrimiento. El trabajo tenía por objetivo analizar la asociación entre las variables clínicas y los grados de incapacidad física en casos nuevos de hanseniais. **Materiales y Métodos:** Estudio transversal y analítico, realizado en la Unidad de Referencia en hanseniais del Estado de Pará en Brasil. Los datos se obtuvieron a partir de 323 historias clínicas de pacientes diagnosticados con hanseniais en el período comprendido entre 2005 y 2014. Para verificar la fuerza de asociación entre las variables se utilizó el cálculo de la Razón de Prevalencia (RP). **Resultados:** El porcentaje de Grado 1 y 2 de incapacidades físicas sumó 28,1% y las variables clínicas asociadas a su instalación fueron: ser multibacilar (RP=7,2); tener una baciloscopia positiva (RP= 2,0); presentar episodios reaccionales (RP=2,4); y tener 4 o más nervios afectados (RP=17). **Discusión:** El predominio de la forma clínica contagiosa y potencialmente incapacitante aumenta el riesgo de reacciones y de compromiso neural, lo que lleva a incapacidades. **Conclusiones:** Para fortalecer las acciones del programa de hanseniasis se necesitan acciones más efectivas para mejorar el diagnóstico temprano, reducir las incapacidades, y también potencializar la capacidad operativa de la atención primaria.
**Palabras clave:** Lepra; Epidemiología; Factores de Riesgo; Personas con Discapacidad.

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## INTRODUCTION

Leprosy, also known as Hansen's disease (HD) which etiological agent is *Mycobacterium leprae,* has preference for epithelial cells and peripheral nerves. The bacillus' action causes sensory and sensitivity disorders in both motor and autonomic nerves, which results in high levels of disabilities[1]. It is considered a tropical neglected disease since it is present in the poorest layers of population and it receives poor visibility and investments in the pharmaceutical industry[2].

HD represents the main infectious cause of disability and an important cause of morbidity in the population, whose transmission is still continuous and sustained in some endemic areas of the world[2, 3].

Patients with MH are classified according to the level of peripheral nerve involvement through simplified neurological assessment at the time of diagnosis.

The Evaluation of Degree of Physical Disability (GIF) is an epidemiological indicator that allows and indirect estimate of effectiveness of actions in early detection of the disease[4]. Three GIFs are considered, in ascending order, according to the involvement of eyes, hands and feet : degree 0: absence of disabilities; degree 1: results from sensory changes in the hands and/or feet and/or eyes ; and degree 2 is associated with the presence of changes in installed motor disability, such as bone resorption, lagophthalmia, ulcer, claws, and other[5].

The simplified neurological assessment is one of the steps recommended by the Ministry of Health (MOH), performed by professionals who make up the multidisciplinary team of health, who need to be alert to compromise evidence in nerves, such as pain and/or thickening of palpation, sensitivity changes in the path of the nerves, muscular strength deficit in hands and feet, among others[5]. They should also be able to early diagnose neural impairment, intervening in a timely manner to prevent the onset of disability[6].

Brazil is the second country in number of new cases of detected HD in the world, with 25,218 cases and in2016[7], and it is one of the few countries not to achieved the goal of eliminating the disease characterized by reaching 01 cases or less for every 10,000 inhabitants , proposed by the World Health Organization (WHO ), admitting the need for a long way to reach this level[2 -3].

Distribution of these cases is heterogeneous among regions in Brazil and some states keep a high prevalence rate, for example: Mato Grosso (7.71/10,000); Tocantins (7.39/10,000); Maranhão (4.03 / 10.000); Mato Grosso do Sul (2.66 / 10.000 inhabitants) and Pará (2.55 / 10.00 inhabitants)[8]. It is noteworthy that the state of Pará is amomng the six states that gathers 10 "clusters" of municipalities where nearly half of new cases of leprosy are concentrated at country level[4].

Data from the Ministry, 2016, indicate that 7, 9% of newly diagnosed cases of HD had degree 2 physical disability, that is to say, some visible deficiency in the eyes, hands and/or feet[8]. In Pará, in the same year, 171 were registered, that is,

7.2% of patients with physical disability degree 2 at the time of diagnosis, these figures are deemed as of big concern[8].

Physical inabilities, when installed, affect the lives of individuals and interfere in their quality of life, resulting in social and psychological damage that can lead to social exclusion[4, 9]. Although curable, MH is still considered a stigmatized disease[10].

Regarding the challenge of the National Leprosy Control Program (PNCH) for comprehensive care and minimization of physical disabilities due to the pathology, knowledge of clinical variables that lead to development of such complications is important for actions leading to prevent disability. In this context, this study aimed at analyzing the relation between clinical variables and degree of physical inability in new cases of MH, diagnosed at the Unit of Reference in HD in the State of Pará from January 2005 to December 2014.

## MATERIALS AND METHODS

An analytical and cross-section study[11], held in the Specialized Reference Unit in Sanitary Dermatology- URE "Dr. Marcello Candia", located in the city of Marituba, in the metropolitan area of Belém , in the state of Pará.

Data were collected from 341 medical records of patients diagnosed as new cases of leprosy in the URE, in the period from January 1 d and 2005 December 31, 2014. This amount was calculated from the total of medical records corresponding to the cases, which was 2,314. From this total, the total sampling was calculated(n), according to Fontelle's formula[12] : $n = N.n0 / n0 + N$ , where: $n0 = 1 / E0^2$ ; N = population size studied; n 0 = first, value around sample size and E0 = 5% sampling error .

The following were the inclusion criteria: be new a case of MH and have evaluated GIF and recorded in the medical record. Eighteen records that failed and /or that had errors in GIF registration were excluded. The following variables were set forth: operational classification, smear microscopy, reaction episodes, time elapsed between the perception of signs and symptoms of the disease and the diagnosis, number of affected nerves and Degree 1 and 2 of physical disability evaluated at diagnosis.

We collected information relating to GIF from the "Simplified Neurological Assessment Form" which is attached to the medical record, where nurses, physical therapists, and doctors evaluate and classify the patient as a GIF in RUE[1].

The collected data were stored in a Microsoft Excel spreadsheet; they were then transferred to the Statistical *Package for Social Science* (SPSS) Program, version 20.0, and analyzed according to selected variables.

Association strength analyzes were performed by calculating the Prevalence Ratio between the presence (GIF 1 and 2) and absence (Grade 0) of physical disabilities at the time of diagnosis, and the variables: operational classification, smear microscopy, episodes reactions, time to diagnosis and number of affected nerves[12]. The significance

level adopted was 5% ($p < 0.05$) with confidence interval of CI = 95%.

Anonymity and confidentiality of information were assured, as well as other ethical aspects, according to resolution # 466/ 12 of the National Health Council, and the survey only started after approval by the Ethics Committee in Research Involving Human Beings (CEP) from Nursing Undergraduate Course of the State University of Pará (UEPA) , on 12/02/15, under opinion nº 1.348.296 .

As this is secondary data, the URE employee responsible for keeping the records signed the Record Access Authorization Term prior to making them available for data collection.

## RESULTS

Throughout the study period, there was a predominance of diphorm clinical form in 60.1 % (n = 194) of cases and multi-bacillary operational classification (MB) in 77.1% (n = 249). A considerable percentage, 36.5% (n = 118), had 1 (one) more affected nerves. It is noteworthy that the degree of physical disabilities 1 and 2 reached 28.1% (n = 91) of the cases and degree 2 of disability appeared in more than 10% (n = 34) of the analyzed sample (Table 1).

**Table 1. Distribution of new leprosy cases in "Dr. Marcello Candia ", according to patients' clinical variables , from 2005 to 2014. Belém / 2016. (n = 323)**

| Analyzed Variables | n | % |
|---|---|---|
| **Clinical Form** | | |
| Undetermined | 21 | 6,5 |
| Tuberculoid | 52 | 16,1 |
| Dimorfa | 194 | 60,1 |
| Virchowiana | 56 | 17,3 |
| **Operational Classification** | | |
| Paucibacillary | 74 | 22,9 |
| Multibacillary | 249 | 77,1 |
| **Nerves Affected** | | |
| One | 37 | 11,5 |
| Two | 36 | 11,1 |
| Three | 8 | 2,5 |
| Four or more | 37 | 11,4 |
| None | 205 | 63,5 |
| **Degree of Physical Disability** | | |
| Zero | 232 | 71,8 |
| One | 57 | 17,7 |
| Two | 34 | 10,5 |

*Source: From the authors, elaborated with data collected in the Specialized Reference Unit (URE) in Sanitary Dermatology "Dr. Marcello Candia"- Apr / 2016.*

In Table 2, we see that 23.8% (n = 77) of cases waited from 6 to 12 months between the perception of signs and symptoms to the diagnosis of disease, this information was not included in 32.2% (N = 104) of the cases. Regarding smear microscopy, a considerable percentage, 31.6% (102), presented positive smear; 17.9% (n = 58) of the cases had reaction episodes and, among them, the majority , 67.3 % (n = 39) , presented type 1 reaction.

**Table 2. Distribution of new leprosy cases in the URE "Dr. Marcello Candia", according to patients' clinical variables, from 2005 to 2014. Belém / 2016. (n = 323)**

| Analyzed Variables | n | % |
|---|---|---|
| **Elapsed Time** | | |
| Less than 6 months | 49 | 15,2 |
| 6 to 12 months | 77 | 23,8 |
| 13 to 24 months | 56 | 17,3 |
| Greater than 25 months | 37 | 11,5 |
| Unknown | 104 | 32,2 |
| **Bacilloscopy** | | |
| Negative | 140 | 43,3 |
| Positive | 102 | 31,6 |
| Not done | 68 | 21,1 |
| Ignored | 13 | 4,0 |
| **Reaction Episodes** | | |
| Not | 259 | 80,2 |
| Yes | 58 | 17,9 |
| Ignored | 6 | 1,9 |
| **Reaction Types (n = 58)** | | |
| Type 1 | 39 | 67,3 |
| Type 1 and 2 | 10 | 17,2 |
| Type 2 | 9 | 15,5 |

*Source: From the authors, elaborated with data collected in the Specialized Reference Unit (URE) in Sanitary Dermatology "Dr. Marcello Candia"- Apr / 2016.*

According to Table 3, the percentage of physical disability degrees 1 and 2 was 28.1 % and the clinical variables associated with it were: being multibacillary (PR = 7.2 - p-value 0.0001), having smear positive (PR = 2.0 - p-value 0 0 163) with reactional episode (RP = 2.4 - p-value 0.0036), and have 4 or more affected nerves (RP = 17 - p value 0 0 010). The variable elapsed time, was the only one which did not show statistically significant association with the GIF 1 and 2.

**Table 3. Prevalence ratio of physical disabilities due to leprosy in new cases at ERU "Dr. Marcello Candia", 2005 to 2014. Belém / 2016 (n = 323)**

| Variables | Degree 0 | | Degree 1 and 2 | | RP[1] | P-Value[2] |
|---|---|---|---|---|---|---|
| | N | % | n | % | | |
| **Operational Classification** | | | | | | |
| Paucibacillary | 69 | 21,3 | 5 | 1,5 | 7.2 | <0.0001* |
| Multibacillary | 163 | 50,4 | 86 | 26,6 | | |
| **Bacilloscopy (n = 242)** | | | | | | |
| Negative | 104 | 42,9 | 36 | 14,8 | 2.0 | 0.0163* |
| Positive | 60 | 24,7 | 42 | 17,3 | | |
| **Reaction episodes (n = 317)** | | | | | | |
| Yes | 32 | 10,0 | 26 | 8,2 | 2.4 | 0.0036* |
| Not | 195 | 61,5 | 64 | 20,1 | | |
| **Elapsed Time (n = 219)** | | | | | | |
| Up to 12 months | 90 | 41,1 | 36 | 16,4 | 1.0 | 0,9289 |
| Over 12 months | 66 | 30,1 | 27 | 12,3 | | |
| **Number of nerves affected (n = 118)** | | | | | | |
| 1 to 3 | 26 | 22,0 | 55 | 46,6 | 17.0 | 0.0010* |
| 4 or more | 1 | 0,85 | 36 | 30,5 | | |

(1) Prevalence Ratio (PR).
(2) Significance at the 0.05 level.

*Source: From the authors, elaborated with data collected in the Specialized Reference Unit (URE) in Sanitary Dermatology "Dr. Marcello Candia"- Apr / 2016.*

## DISCUSSION

For the limited timeline from 2005 to 2014, 28, 1 % of participants in the study showed GIF 1 and 2, at diagnosis, pointing out that this is at late stage. The proportion of cases with GIF 2 had an average considered high (10.5%) according to the parameters established by Ministry of Health[1]. Those data point out to the persistence of disease cycle and hidden prevalence. It is emphasized that, due to faults in the work process, patients needed to be referenced to the ERU to receive the diagnosis and initiate the treatment of the disease, even with visible disabilities.

The treatment of the condition, a neurological evaluation simplified the application of basic techniques of prevention of disabilities, among others, there are procedures that should be performed at the Basic Health Units (BHU). Given the complexity of certain situations that cannot be resolved within the BHU, they should be referred to the Reference Centers[1].

Regarding **the operational classification,** there was a predominance of multibacillary( MB ) cases with 77.1% , corroborating studies conducted in other locations : São Paulo[13], Maranhão[14], Diamantina[15], province of Corrientes[16], Bogota / Colombia[17], and Ethiopia[18], which also showed high percentages in relation to the MB classification, presenting 73%, 72.9 %, 73.2%, 70.3 % , 67.9% and 99.2%. , respectively. Thus, this finding is an alert to the health ser-

vice, since there is a predominance in forms of transmission and potentially crippling disease[17].

The diagnosis of MH should occur in the initial clinical forms of undetermined Paucibacillary (PB) and tuberculoid. However, we observe a greater number of notifications in the unstable pole of the disease and in its transmission forms MB: borderline and lepromatous, in which there is multiplication of bacillus with skin lesions and extensive number sas and involvement of nerves. Thus, the detection is occurring late with greater possibility of installation of physical disabilities, especially in the neediest and non-served areas in large metropolises[2].

The peculiar characteristics of the disease, such as its long incubation period, insidious signs and symptoms, allied to the operational deficiencies of services, the lack of trained health professionals and the difficult access to health services, become an obstacle for early diagnosis[19].

As **the association of the operating classification GIF** of patients, evidence shows that 26.6% (n = 86) of cases with physical disabilities were classified as MB. They have 7.2 times higher prevalence of physical disabilities due to MH compared with patients with CP classification (p-value <0.05).

Findings are compatible with those from other studies: In Colombia, MB patients were 1.3 times more likely to develop disabilities compared to paucibacillary patients[17]. In Aracaju, there was a 2.7 risk factor for multibacillary disabilities compared to paucibacillary disabilities[19]. Thus, multibacillary patients were 5.7 times more likely to develop physical disabilities in Minas Gerais[20]. The proportion of cases of MH m ultibacilares is a risk indicator for developing complications and it is strongly related to the support of transmission chain and hidden prevalence[1].

As for **smear microscopy,** it was observed that 31.6 % (n = 102) of the cases had positive smear. This finding is consistent with previous studies: In João Pessoa 12.1 %[6] ; in Bogota 55.5%[17]; in Ethiopia 41.5 %[18] and in Maranhão 42.3%[14], although not all patients underwent the exam.

The **smear results associated with GIF,** it was observed that 43.3% (n = 140) of cases were negative; However, PR shows that cases of patients with positive smear results have 2.0 times the prevalence of physical disabilities due to MH (p-value <0.05).

An international study found a significant association of the initial bacilloscopic index ≥ 2 with the occurrence of disabilities, and they were 1.4 times more likely to develop disabilities compared to those with a bacilloscopic index <2[17]. This was also reported by other studies the s at level national in which it noted that the positive smear is associated with GIF 1 and 2[6] and increased chance of disability at 1.7 times[20].

Skin smear serves to support the diagnosis, and makes up one of the criteria for confirmation of recurrence[14]. The bacillary index > 2 has

been reported as a risk factor for neuropathy, since patients diagnosed with positive bacilloscopy are more likely to evolve with reaction frames and, consequently, with physical disabilities[20].

Regarding the **reaction episodes,** it was found that 17.9% (n = 58) had reactions, most of them 67.3 % (n = 39) type 1. PR shows a 2.4 times higher prevalence of patients who presented reactions. leprosy evolve with physical disabilities when compared to those who had no reaction (p-value <0.05). Some studies indicate different proportions of the competition reactions in different scenarios: Oliveira and colleagues found 40% of patients enrolled in two treatment centers had reactions , type 1 reaction to being the most frequent in 75.1% of patients[4] while Santos and collaborators found reactions in 13.3% of the cases evaluated[19] and Corrêa and collaborators observed reaction in 43.5%[14].

Regarding the **reaction episodes associated with GIF** , some studies confirm the tendency of reactions to increase the risk of disabilities compared to those who did not have reactions: In Aracaju patients who had reactions increased the risk of disabilities by 2 times[19]; In Ethiopia, patients with type 1 reactions were 1.8 times more at risk of disability, which is close to that found in our study[18].

Reactions and neuritis are complications arising from MH, because periods of acute immune hypersensitivity, and the treatment of these episodes is relevant and aims to prevent and/or reduce the consequences, mitigate the costs with rehabilitation, and impact positive mind functionality and quality of life seen in the affected persons. Patients presenting outbreaks reaction are more susceptible to nerve damage and possible sequelae[4, 19].

The GIF and hence the severity of the disease are related s to the number of reactional outbreaks that may occur during the course of the disease before diagnosis, during treatment and after medicine halt; and cause neural injury, with potential risk of physical disability if not adequately treated[4,14]. Reactions may be confused with disease relapses, so they require differential diagnosis and timely treatment.

The neurological assessment often contributes to early diagnosis of involvement of peripheral nerve trunks, as well as to monitor the evolution of neurological symptoms, assisting both the drug treatment as well as the physical and therapeutical treatments[20].

Regarding the **time elapsed between the perception of signs and symptoms until diagnosis,** it is observed that 23.8% of cases waited from 6 to 12 months for the diagnosis of the disease. It is to remark that such information will be omitted in 32.2% of cases. Given this fact, it is not possible to indicate the reasons why this relevant information is absent from medical records. It is believed that the lack of that record compromises the assessment of this variable and despite the study did not demonstrate statistical significance for this variable (p-value> 0.05), it is believed that the delay in diagnosis influences the development of physical disabilities.

A statistically significant association of delayed diagnosis with GIF was observed in the studies: In Ethiopia cases evaluated with symptom duration 6-12 months and over 24 months were more likely to develop disabilities, with a risk of 2.1 and 2.4 respectively[18]. In Colombia, patients with a delay > 1year at the time of diagnosis were twice as likely to develop disabilities as those with a diagnosis of one year or less[17].

The delay in diagnosis of the disease is a worrying and recurrent factor in several studies: In São Paulo, the average time elapsed between the perception of signs and symptoms until the diagnosis of the disease was 12 months, ranging from 1 month to 10 years[13]; in Bogotá, only 32.1% of patients were diagnosed with the disease during the first year of symptom onset and the time between onset of symptoms and the diagnosis of the 333 patients in their study averaged 2.9 years[17]. The time elapsed between onset of symptoms and diagnostic elucidation is a key prognostic factor for the presence of disability, and the longer the delay in diagnosis, the greater the proportion of patients with disabilities. In this sense, the risk of presenting deformities at the time of diagnosis increases significantly and as it is delayed[13, 17]. Similarly Santos and colleagues found in their study that some people took up to three years between the first consultation and the closing of diagnosis, and said, based on reports of the respondents, the great difficulty stemmed from the lack of preparation of health professionals in recognizing the disease[19].

While in the region of Diamantina, MG, evidence also suggests late diagnosis, as some patients reported the diagnosis after seven months of subsequent consultations and most had to be attended by two or more health professionals to complete the case[15].

In Pará, in a health referral center, the interval between the onset of symptoms and clearance in the diagnosis was greater than 1 year in 73.2% of minors of 15 years of age affected by the condition and 46.3% of them were consulted by 3 or more doctors for a diagnosis[21]. In Belem, in a Health Center, most of people got the diagnosis in a period of two to three months after they started looking for attentions at health services[10].

In this way, the search of diagnosis of MH points out a succession of diagnostic errors, tracing a long and tortuous rout[10]. However, when treatment is well led by qualified health teams and sensitized to the problem, there is a reduction of disabilities[6]. In this context, we emphasize the importance of nursing care in the provision of care to patients affected by the disease with actions for self-care, as well as for the prevention of disabilities, among others.

Regarding the number of **affected nerves,** it was found that 22% (n = 26) of patients had 1 to 3 affected nerves. However, PR pointed out that cases of patients with more than 3 affected nerves are 17 times more prevalent in developing physical disabilities due to MH than patients with up to 3 affected nerves (p-value <0.05). This result reveals a strong association between this variable and GIF 1 and 2. Neural impairment has also been reported in other studies[6, 15, 18, 20].

As **the number of affected nerves related to GIF,** other studies also observed a statical link of that variable with GIF: In Aracaju 55.5% of cases had more than 2 affected nerves and they presented a risk of 6.7 of disability when compared to those who had up to 2 affected nerves[19]; and in MG occurrence of one or more affected nerves increased the risk by 8.4% of developing grade 2 disability[20]; In Ethiopia, it was observed that cases with nerve damage were more likely to develop disabilities and were 13,1 times at higher risk[18].

Thus, the number of affected nerves is significantly associated with an increased risk of physical impairment[20], as evidenced by a study on factors related to the prevalence of physical disabilities, which showed that patients with GIF 1 had on average 2 affected nerves. those with GIF 2 the average doubled to 4 nerves[15].

These results demonstrate that nerve damage is associated with physical disabilities. Thus, regular monitoring of nerve function, combined with adequate clinical management of neuritis, neuropathies and leprosy reactions, are effective strategies to prevent them[1, 15, 19].

The frequency of neuropathy increases significantly in cases with late diagnosis and in patients with a larger number of compromised nerves[20]. In our analysis, this variable presented the most accurate chances of developing physical disability, so the number of thickened nerves should be evaluated and their prognostic importance recognized.

This study has limitations and weaknesses, as it involved only one Reference Unit in Sanitary Dermatology and secondary data that, due to gaps in the records of some variables in the medical records, may have generated some bias to the results.

## CONCLUSIONS

Degrees of physical disabilities 1 and 2 are related to the operating classification MB (PR = 7.2), positive smear (PR = 2.0), reaction episodes (PR = 2.4) and number of affected nerves (PR = 17). These clinical characteristics, in particular, the number of affected nerves can predict deleterious results, so they need more attention from health professionals.

We believe that the knowledge of the clinical variables related to the GIF presented in this study can offer contributions for the establishment of interventions related to its management, control and prevention, as well as aid for the expansion of the research field and MH in the state.

There are gaps in the operationalization of assistance to people affected by the disease. Primary care should be the gateway, however, it has reduced operational capacity regarding the disease control actions. It is necessary for managers to plan actions to combat MH in the municipalities in accordance with current public policies.

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