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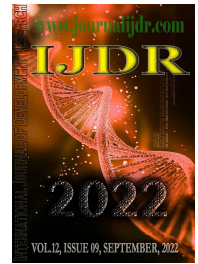
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EPIDEMIOLOGICAL ANALYSIS FROM 2001 TO 2016 AND THE KNOWLEDGE OF PRIMARY CARE USERS IN LEPROSY: A RETROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

Objective: To carry out a survey of Hansen's disease cases in the city of José Bonifácio-SP and to evaluate the knowledge of a sample of the population about this disease. **Methods:** A review of medical patient records warned of Hansen's disease was performed at SINAN (Sistema de Informação de Agravos de Notificação/Notifiable Diseases Information System) in the city of José Bonifácio-SP between 2001 and 2016. In addition, a questionnaire, to evaluate the knowledge degree of the disease, was handed out to 50 users of the Basic Health Unit (UBS – Unidade Básica de Saúde) Dr. João Lania. **Results:** 133 Hansen's disease cases were certified in the city of José Bonifácio-SP, male people are in the majority (49.62%), between the ages of 60 and 69 years (19.54%), and in the undetermined clinical form (30.07%). Regarding the classification and the physical incapacity degree caused by Hansen's disease, the paucibacillary type (48.12%) and degree 0 (44.36%) were, respectively, more frequently found. The questionnaire analysis showed that 29 women (58%) and 21 men (42%), more than half (58%) had known about Hansen's disease and 42% did not know of it. **Conclusion:** In 16 years, more than 100 people developed Hansen's disease in the city that was studied, with the majority being men and elderly people. The questionnaire application has proved to be an important tool in evidencing that many people have many doubts about the transmission form, symptoms, and treatment, which needs to be corrected by health actions developed by the city health department.

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INTRODUCTION

Leprosy continues to claim large numbers of victims every year and with this, it is considered a highlight in the face of neglected diseases, translating into an important public health problem [1]. The disease is caused by the bacillus *Mycobacterium leprae*, which has a predilection for the skin and hair. peripheral nerves [2]. The transmission of this bacterium occurs mainly through the respiratory route, that is, through droplets eliminated in the air by coughing, talking, or sneezing. Its signs and symptoms are whitish, reddish, or brownish spots, which can be smooth or raised, reddish or brownish lumps, areas of the skin, even without spots that do not itch, but tingle or pinch until they become numb, with a decrease or absence of pain, sensitivity to heat, cold and touch [3].

Leprosy is classified for operational purposes of chemotherapy treatment since cases with up to five lesions are considered paucibacillary (PB) and those with more than five lesions are multibacillary (MB). The first is the less severe and presents two clinical variants, tuberculoid leprosy (TL), in which the lesions are well demarcated, in reduced quantity, painless and with asymmetrical distribution, and indeterminate leprosy (IL), characterized by hypochromic, single or multiple, with change in sensitivity and undetermined limits [4]. MB is classified as lepromatous leprosy (LL), whose disseminated skin lesions can be infiltrative, erythematous, with indeterminate, bright and symmetrical proportions, and in deform leprosy (DL), characterized by approaching the morphological aspects of IL and TL [4]. The Ministry of Health defines a case of leprosy for treatment when one

or more of the following criteria are present: skin lesion with altered sensitivity, thickening of the nerve trunk, or positive skin smear [2]. Since 1980, the WHO (World Health Organization) has recommended the use of the multidrug therapy (MDT) regimen, and this measure has resulted in the treatment and cure of more than fourteen million leprosy patients [5]. If leprosy is not treated, it can leave serious sequelae in the carrier's body, compromising touch, vision, and locomotion, that is, the nerves of the skin, legs, and arms, which may make it difficult for carriers to move; the eyes do not close, with the concomitant fall of the eyelashes; the extremities of the body, such as fingers, ears, and nose, can be injured to the point that the individual loses them [3]. As it is a systemic disease, leprosy can also involve other organs and tissues such as the mucosa of the upper respiratory tract, abdominal viscera, lymph nodes, bone marrow, testes, muscles, and bones. These changes can cause deaths, due to complications of the disease [6]. After completion of treatment with MDT (polychemotherapy), the patient may have a relapse, which is defined as the development of new signs and symptoms, either during the period of epidemiological surveillance or at any time. Between 2004 and 2009, the number of relapses in the world remained stable, although the number of countries that had cases of relapse increased from 49 in 2008 to 122 in 2009 [7]. Leprosy has a high prevalence in the population with low education and a lack of basic health care, and social and health care services [8]. The clinical signs of leprosy are often not easily recognized in childhood, but the importance of this condition and its problems social, physical, and psychological development cannot be neglected, due to the high possibility of deformities [9]. It is important to emphasize that the most effective cure for leprosy depends on the early detection of the disease [10]. Therefore, the present study aimed to carry out a survey of leprosy cases in the city of José Bonifácio, São Paulo, between 2001 and 2016 and to assess the knowledge of a sample of the population about this disease.

METHODS

Study Design: This study followed a retrospective observational and longitudinal model, following the rules of clinical research of the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology), available at: <https://www.strobe-statement.org/>. A review of medical records of patients notified with leprosy was carried out at SINAN (Sistema de Informação de Agravos de Notificação/Notifiable Diseases Information System) in the city of José Bonifácio, São Paulo, between 2001 and 2016. Therefore, it is a research with a quantitative and descriptive method in which the following variables: gender, age, clinical form of the disease (undetermined, tuberculoid, diform or lepromatous), classification of infection (paucibacillary or multibacillary) and degree of physical disability (grade 0, I or II). In addition, a questionnaire to assess the degree of knowledge about the disease was distributed to 50 users of the Basic Health Unit Dr. João Lania from the city of José Bonifácio, São Paulo, on a single day in August of this year, after signing the Free and Informed Consent Term.

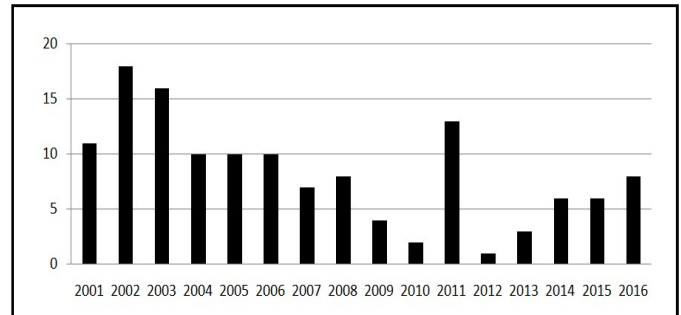
Inclusion and Exclusion Criteria: For inclusion criteria, people who attend the aforementioned UBS, over 18 years old, and of both genders, were considered. People who do not use the UBS and are under 18 years of age did not participate in the study.

Ethical Approval: The work was submitted to the Research Ethics Committee of Universidade Paulista - UNIP and approved according to opinion number 2.118.161.

RESULTS

During the period from January 2001 to December 2016, 133 cases of leprosy were reported in the city of José Bonifácio-SP, with the highest frequency in 2002, followed by a decrease in the following years until 2010. This trend changed in 2011 when the number of people affected increased and decreased again in 2012 at the lowest

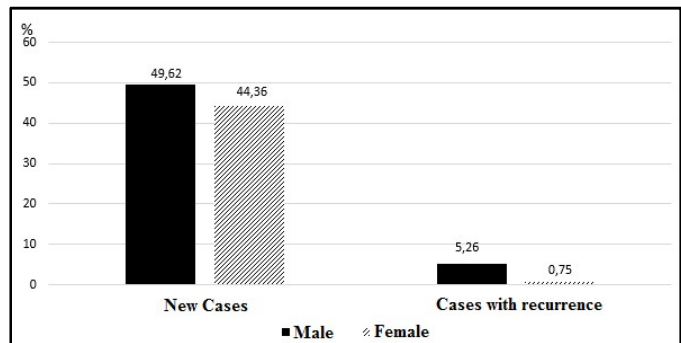
frequency of the period studied. However, after this drop, there was a gradual increase until 2016 (Graph 1).



Source: Author data, 2017.

Graph 1. The number of leprosy cases from 2001 to 2016

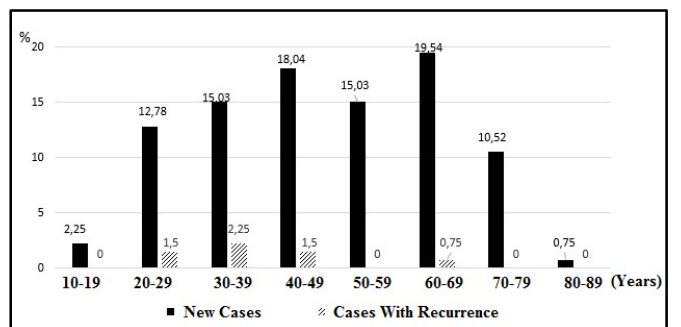
The study showed that most cases occurred in males (49.62%). The same profile was observed in cases of recurrence, in which men were prevalent (5.26%), while in women it occurred in only 0.75% (Graph 2).



Source: Author data, 2017.

Graph 2. Number of leprosy cases by gender

Regarding age, the most affected age group was between 60 and 69 years old (19.54%) and the one with the lowest number of cases was among people aged 80 to 89 years old (0.75%). Unlike the cases of recurrence in which the most affected age group was between 30 and 39 years old (2.25%), followed by people aged 20 to 29 years and 40 to 49 years old (both with 1.5% each) (Graph 3).



Source: Author data, 2017.

Graph 3. Number of leprosy cases by age

The most frequent clinical forms were indeterminate (30.07%) and lepromatous (23.3%), followed by deforming (20.3%) and tuberculoid (19.54%). In cases of recurrence, it was identified that the clinical forms deform and lepromatous occurred more frequently, 3% and 2.25% respectively, followed by the tuberculoid form (0.75%) and the indeterminate form (no case reported) (Table 1). According to the results of this study, most cases were classified as paucibacillary (48.12%), followed by multibacillary (45.86%). Compared to cases of recurrence, it can be observed that most cases were classified as multibacillary (6.01%) (Table 2).

Table 1. Number of leprosy cases by clinical form of the disease

ClinicForm	Case numbers	Percentage (%)	Cases withrecurrence	Percentage (%)
undetermined	40	30.07	0	0
tuberculoid	26	19.54	1	0.75
Deform	27	20.3	4	3
Virchowiana	31	23.3	3	2.25
Notidentified	1	0.75	0	0
Total	125	93.96	8	6

Table 2. Number of leprosy cases by infection classification

Classification	Case numbers	Percentage (%)	Cases withrecurrence	Percentage (%)
paucibacillary	64	48.12	0	0
multibacillary	61	45.86	8	6.01
Total	125	93.98	8	6.01

Source: Author data, 2017.

Table 3. Some leprosy cases by the degree of physical disability

Grade	Case Numbers	Percentage (%)	Cases withrecurrence	Percentage (%)
Grade 0	59	44.36	2	1.5
Grade I	54	40.6	5	3.75
Grade II	8	6.01	1	0.75
notrated	4	3	0	0
Total	125	93.97	8	6

Source: Author data, 2017.

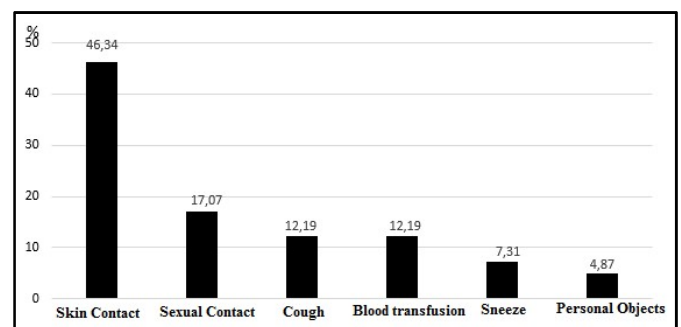
Table 4. Answers to the questionnaire were applied to patients at the UBS Dr. João Lania

Questionnaire	Alternativesunderanalysis	NumbersofPatients (Total 50)	Relativefrequency
Gender	Male	21	42%
	Female	29	58%
Level of Education	Incomplete or complete elementary school	9	18%
	Incomplete or complete high school	30	60%
	Incompleteor complete higher	11	22%
	Illiterate	0	0%
Knowledge about leprosy/leprosy	Yes	29	58%
	No	21	42%
Leprosy/leprosy treatment	Vaccine	14	28%
	Anti-inflammatory	5	10%
	Antibiotic	31	62%
Leprosy/leprosy is curable	Yes	43	86%
	No	7	14%
Leprosy/leprosy can lead to sequelae	Yes	45	90%
	No	5	10%
Leprosy occurs more often	Men	5	10%
	Women	5	10%
	There's no difference	40	80%

Source: Author data, 2017.

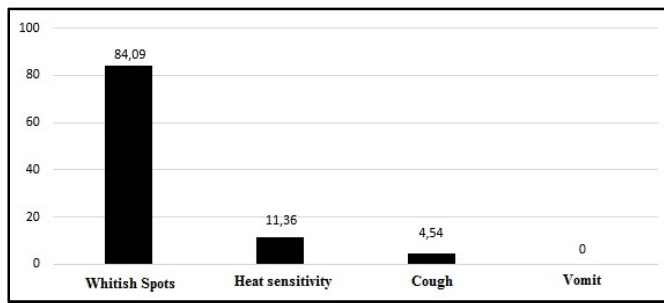
In terms of the degree of physical disability caused by leprosy, most cases were grade 0 (44.36%), followed by grade I (40.6%), and finally, grade II (6.01%). When comparing the cases of recurrence, it can be observed that grade I (3.75%) occurs more frequently in patients, secondly, grade 0 (1.5%), and thirdly, grade II (0.75%) (Table 3). Regarding the questionnaire that was applied to 50 patients, it can be observed that 29 (58%) knew about leprosy and 21 (42%) did not know about the disease. When assessing the level of education, most had completed or incomplete high school (Table 4). Regarding treatment, 62% responded that leprosy is treated with antibiotics and only 28% with a vaccine.

Only 10% of respondents chose anti-inflammatory as a treatment option. The survey also showed that most participants responded that leprosy is curable, can lead to serious sequelae, and occurs at the same frequency in men and women (Table 4). Graph 4 presents the results of the responses concerning the form of transmission of the disease. It is observed that 46.34% of the patients said that contact with the skin is the main form of transmission of the disease, against 4.87%, who chose personal objects. Graph 5 shows that most respondents chose whitish spots as the main symptom of the disease and only 4.54% chose cough.

**Graph 4. Relative frequency of responses from patients who chose only one response regarding the transmission of leprosy/leprosy**

DISCUSSION

The present study showed that there was a variation in the number of leprosy cases in the city of José Bonifácio-SP during the analyzed period, with an increase in patients in the second, eleventh and sixteenth years after a reduction interval.



Source: Author data, 2017.

Graph 5. Responses from patients who chose only one response about leprosy/leprosy symptoms

This fact may be related to the carelessness of some patients, the consequent transmission of the microorganism, and the lack of patients to take the treatment until the end (as we observed during the research with the medical records). And after a period of treating patients and with the discovery of symptoms early in the disease of new cases, the frequency can be reduced. The male gender was the most affected by leprosy in the present research, corroborating the data found in Rondônia, where 57.1% of the cases of this disease occurred in males [8]. It is believed that this fact is related to the lack of concern for men with the disease health and aesthetics, unlike women. Regarding age, the present study showed that the most affected age group was from 60 to 69 years old, different from what was found in the research carried out in 2011, in the extreme south of Santa Catarina, where the age group with the highest involvement of the disease it was between 30 and 39 years old, which may be related to the aging of people and, consequently, to the decrease in their immunity. According to other studies, when referring to children, the rates are lower, which may be associated with the protection that the BCG vaccine provides, making it an important ally in the prevention of the disease [3]. The clinical form that occurred most frequently was the indeterminate one, which explains the fact that the others present lower rates, since the deform, lepromatous, and tuberculoid forms are an evolution of the indeterminate, due to the delay in diagnosis, that is, patients have sought early medical care for the treatment of the disease. Different from what happened in the municipality of Mossoró, in northeast Brazil, where the clinical form that presented the highest frequency was the lepromatous (55.74%), followed by the deform (32.79%) [1], showing a delay in the treatment of the disease, which can be caused by the delay in looking for a doctor due to the population's lack of access to health or neglect of their health.

In patients affected by leprosy, it was observed that the classification that presented the highest rate was paucibacillary, and this may also be related to the fact that patients seek early medical care as soon as they perceive the first signs of the disease. Also in the municipality of Mossoró, in northeast Brazil, concerning the classification of the disease, multibacillary cases were predominant (91.80%) [1]. The research showed that, when it comes to the degree of physical disability caused by leprosy, most cases presented grade 0 (when there are no neural impairment in the eyes, hands, and feet), followed by grade I (which corresponds to a decrease or loss of sensitivity) and finally grade II (which indicates the presence of disabilities and deformities such as lagophthalmos, claws, bone resorption, dropped hands and feet, among others) [3], which may also be related to the demand for early medical care, avoiding thus greater sequelae. A survey carried out in Rondônia also showed that the most prevalent degree of physical disability was degree 0 (75%) [8]. Regarding people's perception of leprosy, it was observed that 58% of people are aware of what leprosy is, but they still have many doubts about the pathophysiology of the disease, especially about transmission. It can be seen that the level of education did not influence the knowledge of this disease, since most of the interviewees had completed or incomplete high school and higher education. The survey shows that only 12.19% of respondents know how the disease is transmitted, a low number compared to a survey carried out in Uberaba-MG, where

it was possible to assess that before the educational activity that was applied in the city, only 7 people (7.3%) knew the disease transmission mechanism, while after the educational action this number rose to 83 (86.5%) [11]. It was also observed that before the educational action, 54 respondents (56.3%) knew that leprosy causes white and red spots and this number increased to 85 (89.4%) after the action [11], compared to our study that also shows that the majority of respondents 84.09% know the symptoms of the disease, it is up to the health department of José Bonifácio, to organize lectures and other preventive actions so that these doubts can be clarified, and with that to reduce each year the number of leprosy cases in the city.

CONCLUSION

In 16 years, 133 cases of leprosy were reported in the city studied, with a predominance of cases in men and the elderly. The application of the questionnaire proved to be an important tool to show that many people have many doubts about the transmission, symptoms, and treatment of this disease. With this, preventive actions should be taken to clarify doubts, in addition to increasing the number of children vaccinated with the BCG vaccine so that soon there is a reduction in the number of cases of this disease in that city.

Acknowledgment: Not applicable.

Ethics Approval: A study was carried out following the Brazilian National Health Council, Resolution n° 466/212. The work was submitted to the Research Ethics Committee of Universidade Paulista - UNIP and approved according to opinion number 2.118.161.

Informed Consent: All participants who agreed to participate voluntarily provided their consent before participation.

Data Sharing Statement: No additional data are available.

Conflict of Interest: The authors declare no conflict of interest.

Similarity Check: It was applied by Ithenticate®.

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