The prevalence of *Schistosoma mansoni* infection in a small municipality, Pernambuco, Brazil in 2019

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Abstract: Schistosomiasis mansoni is a neglected disease that affects thousands of individuals living in endemic areas, even with all health services to control and reduce its prevalence. This study aims to describe the prevalence of *Schistosoma mansoni* infection in the municipality of Glória do Goitá, in the state of Pernambuco, in 2019. This is an epidemiological, prospective, descriptive study with a quantitative approach, conducted with secondary data extracted from the Schistosomiasis Control Program System (SISPCE). Among the 1,055 tests analyzed, 1,042 of these samples indicated a negative result, thus presenting a total of 98.77% of the proportion of negative people. Therefore, it is essential to invest and implement Health Education campaigns on the forms of transmission, prophylaxis and treatment of *Schistosoma mansoni* infection directed to all residential areas (rural area and urban area) of the municipality under study.

Keywords: Neglected diseases; Schistosomiasis; Social Vulnerability

1. Introduction

Schistosoma mansoni, a helminth that is housed in freshwater snails of the *Gastropoda* Class, Planorbidae Family, Biomphalariagenus, and the species *Biomphalaria glabrata* is

described as the vector found in the Northeast (BARRETO, 2015).

Since considered a neglected disease, it offers a risk there are thousands of individuals living in endemic areas, even with

all health services to control home and reduce its prevalence (COSTA, 2017).

According to records pointed out by the World Health Organization, about 3.5% of the world population, which is roughly equivalent to 200 million, is infected by three of the main species of *Schistosoma* (*mansoni*, *haematobium* and *japonicum*), and may evolve asymptomatic cases that are even extremely severe (OLIVEIRA, 2018).

Therefore, studies show that approximately 2.5 to 8 million individuals are affected by *Schistosoma mansoni* in Brazil. The Northeast and Southeast regions are the most affected, and the states that form the Northeast Region are the ones with the highest prevalence for this disease (MELO, 2015).

According to the figures found related to the national mortality rate, the state of Pernambuco offers a five times higher picture when compared to other Brazilian states. Records indicate that 102 municipalities in Pernambuco are endemic to schistosomes, out of a total of 185 municipalities that make up the state. Being described as the Federated Unit of the national territory with the highest degree of endemicity (BARRETO, 2015).

The occurrence and distribution of schistosomiasis in the state of Pernambuco, more precisely in the Zona da Mata, presents a percentage of infected individuals per area of 80%. This area does not present only a predominant determinant. Several factors in the areas described as areas of high transmission potential have higher and lower levels, when applied the degree of relevance. Professional activities in horticulture, leisure and even migration, are considered factors, which when associated, offer a standard of transmission in the area. More specifically, in the municipality of Glória do Goitá, where the coscopic research was applied from March to December 2019. The influence of factors such as climate, contact with water collections and the type of socioeconomic activity effectively contributed to the transmission cycle occurring.

With the discovery of effective prophylactic measures for the containment of *Schistosoma mansoni*, it was observed in an erroneous view that this disease was resolved, which followed a temporary forgetfulness with regard to this parasitosis. As a result, there was an increase in the incidence of *Schistosoma mansoni* in the state, causing the framing of this parasitosis in the group of neglected diseases (MELO, 2015).

Therefore, this study aimed to describe the prevalence of *Schistosoma mansoni* infection in the municipality of Glória do Goitá, in the state of Pernambuco, in 2019. Thus, we contribute to epidemiological information to alert health authorities, especially with regard to the development of Control and Combat Programs, especially in the geographically most affected areas in the municipality.

2. Methodology

This is an epidemiological, cross-sectional, prospective,

descriptive study with a quantitative approach, the data applied in the research were captured from the System of the Schistosome Sistosomosis Program (SISPCE), carried out between March and December 2019.

The summary of the coproscopy and treatment activities by locality used were provided by the Department of Health Surveillance – Coordination of Environmental Health Surveillance, after the presentation of the letter of consent provided by the Municipal Health Department of Glória do Goitá, Pernambuco, in which it authorized the liberation and use of those.

The method used for parasitological diagnosis was Kato-Katz. The fecal material processing and blade analysis were performed by technicians from the municipal Health Surveillance. The variables analyzed were: total of existing locations; total of localities worked (rural area and urban area); number of localities with prevalence $\geq 5\% < 25\%$; local amount with prevalence $\geq 25\%$ and $< 50\%$; local amount with prevalence $\geq 50\%$; number of tests performed (gender and age); total positive localities; proportion of positive localities; number of people with 1-4 eggs; prevalence of people with 1-4 eggs; number of people with 5-16 eggs; prevalence of people with 5-16 eggs; numbers of people ≥ 17 eggs; prevalence of people with ≥ 17 eggs.

A database has been created in Microsoft Excel version 2013. A descriptive statistical analysis was performed with measures of central and relative tendency (mean and proportion).

For dealing with secondary data of human beings, the present study was submitted to the Ethics Committee on Research with Human Beings of the University Center of Vitória de Santo Antão - UNIVISA and presents the CAEE number: 39760520.1.0000.9227.

3. Results and discussion

Sociodemographic aspects

From January 1 to December 20, 2019, the resident population worked in the municipality of Glória do Goitá was 1,732, of which 1,055 were tests performed/analyzed and 677 samples were not collected. Among the 1,055 tests analyzed, 1,042 of these samples indicated negative results, that is, they did not detect eggs in fecal samples, thus presenting a total of 98.77% of proportion of negative people. When analyzing the general proportion of positive localities, it was evidenced that such data came into line with studies conducted in other municipalities in the state of Pernambuco, such as: Forte Orange (Itamaracá), Porto de Galinhas (Ipojuca), Carne de Vaca and Ponta de Pedras (Goiana), Piedade (Jaboatão), Janga and Pau Amarelo (Paulista), and Mangue Seco (Igarassu). In addition, schistosome mansoni is endemic to rural areas, but studies conducted on the state's coast point to human cases presenting the acute clinical form of the disease (BARBOSA, 2017), (Table 01).

Table 01. Total existing locations; total of localities worked (rural area and urban area); positive localities; general proportion of positive localities.

Total of existing locations in the municipality under study	Worked localities (rural area and urban area)	Positive locations	Overall proportion of positive locations
101	32	09	28,13%

When analyzing the number of locations with prevalence $\geq 25\%$ and $< 50\%$; $\geq 50\%$ was evidenced that such data came into line with a study that demonstrates the existence of a decreasing trend of schistosome positivity in the state of Pernambuco, a global average of 9.2% positivity, presenting the following percentages per Regional Health: regional health III (Palmares) presented higher average positivity (13.8%), followed by regional II (Limoeiro: 9.9%) and I (Recife: 7.8%); Regional V (Garanhuns) presented the best mean treatment (95.6%), followed by the III (86.6%); Pernambuco showed a decreasing trend in positivity for schistosomes ($p=0.005$) (BARRETO, 2015). (Table 02)

Table 02. Quantity of localities with prevalence $\geq 5\% < 25\%$; local amount with prevalence $\geq 25\%$ and $< 50\%$; local amount with prevalence $\geq 50\%$

Number of localities with prevalence $< 5\%$	Quantity of localities with prevalence $\geq 5\% < 25\%$	local prevalence with $\geq 25\%$ and $< 50\%$	Local quantity with prevalence $\geq 50\%$
06	03	00	00

As for the population worked, we had a total of 1,732 individuals who received the pots to perform the coproscopic examination, but of these 1732 individuals, only 1,005 returned the pots presenting viable samples. A total of 677 individuals did not perform the pot devolution containing the fecal cake sample. (Table 03).

Table 03. Quantity of examinations performed

Number of tests performed	Population worked	Samples not collected
1.005	1.732	677

Another limitation of the present study is related to the use of secondary data, with lack of filling out some information and possible inconsistencies. It is also noteworthy the lack of a direct relationship between infection intensity and disease prevalence. In other words, there may be a significant reduction in the percentage of positivity without necessarily changing the parasitic load. (Table 04).

Table 04. Number of people with 1-4 eggs; number of people with 5-16 eggs; numbers of people ≥ 17 eggs

Number of people with 1-4 eggs	Number of people with 5-16 eggs	In the number of people ≥ 17 eggs
12	01	00

When analyzing the prevalence rate of people aged 1 - 4; 5 - 16; ≥ 17 , in the municipality of Glória do Goitá, it was evidenced that the prevalence rate is found and fell in the municipality, being responsible for reducing this index the appropriate treatment for individuals diagnosed positive for *Schistosoma mansoni* and, as well as the implementation of health education activities, being these principals responsible for controlling and combating this disease recognized as a neglected disease. These data corroborate a study conducted in the state of Pernambuco during the years 2010 - 2016 to which, analyzed a total of 1,071,982 coscopic examinations. Most health regions examined approximately 70.0% of the target population, with the IV health region with the highest record (86.0%) in 2012 and the VIII health region, the lowest (50.5%), in 2015. 35,973 individuals received treatment, the highest percentage of which was recorded by the III health region (100.0%), in 2014, while the I health region recorded the lowest, 47.0% in 2016 (BRITO *et al.*, 2020). (Table 05)

Table 05. Prevalence of people with 1-4 eggs; prevalence of people with 5-16 eggs; prevalence of people with ≥ 17 eggs

Prevalence of people with 1-4 eggs	Prevalence of people with 5-16 eggs	Prevalence of people with ≥ 17 eggs
1,14%	0,09%	00%

Inconsistencies related to typos and/or losses in the process between data collection and their inclusion in the system constitute limitations of the study. The information provided here refers only to the percentage of the endemic population that was the target of coproscopic surveys, preventing any population inference from the present analysis.

4. Conclusions

Therefore, to analyses the prevalence rate of people aged 1 - 4; 5 - 16; ≥ 17 , in the municipality of Glória do Goitá, it was evidenced that the prevalence rate is found and fell in the municipality, being responsible for reducing this index the appropriate treatment for individuals diagnosed positive for *Schistosoma mansoni* and, as well as the implementation of health education activities, being these main responsible for controlling and combating this disease recognized as a neglected disease. In view of the above, it is essential to invest and implement Health Education campaigns on the forms of transmission, prophylaxis and treatment of *Schistosoma*

mansoni infection directed to all residential areas (rural area and urban area) of the municipality under study, in order to boost the process of control and combat of this endemic disease.

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