



ORIGINAL RESEARCH PAPER

Biological Science

INCIDENCE AND PREVALENCE OF INTESTINAL PARASITES IN THE HUMAN POPULATION OF THE MUNICIPALITY OF TAVARES, PARAIBA, BRAZIL.

KEY WORDS: Protozooses, Helminthoses, Prevalence, Basic Sanitation.

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ABSTRACT
 Worldwide the protozooses and helminthoses are among the most incidents diseases in Brazil intestinal parasites are revealed as a major public health disorder, with recurring especially in underdeveloped countries. This work was developed with the intention of presenting the levels of incidence and prevalence of intestinal parasitosis detected through the results of parasitological examinations of individuals from the municipality of Tavares, PB. Data collection was performed at the Diagnostic and Clinical Analysis Center-CEDIACLIN. The results analyzed were from January 2013 to December 2015, separated into positives and negatives, afterwards, the parasites present and their frequency in the positive results were classified. In total, 1,437 exams were performed, where 64.60% were positive, *Endolimax nana* being the most frequent protozoan, with 380 cases (41%) and *Ascaris lumbricoides* for helminths, with 28 cases (3%). Among the positive results for parasitosis, 60.30% had a polyparasitism, and 39.70% had monoparasitosis. It was observed that more than 60% of the individuals were infected by some parasitic species, and the protozoa were more frequent in relation to helminths. Highlighting the urgent need for preventive measures in the population, to occur an awareness and prevention of parasites, as well as improvements in sanitation conditions that the population is currently.

1 INTRODUCTION

Intestinal parasites have a wide spread throughout the world, and in Brazil it is a major disorder in public health (1). They are recurrent mainly in the rural areas and in regions where there are cohabiting disadvantaged individuals, which portrays socioeconomic inequality, which is associated with determinants such as precarious housing, lack of basic sanitation, inadequate sanitary facilities; which predisposes individuals to poor hygiene conditions increasing the susceptibility to the incidence of parasitosis (2).

Intestinal infections are common worldwide, an estimated 3.5 billion people are infected with helminths and / or protozoa, and of these 450 million are diagnosed with some disease caused by these parasites, affecting mostly children (3). Children are more susceptible to parasites because they generally do not follow the basic rules of personal hygiene, but they are also in contact with soil and water, places that are centers for transmission of these parasites (4)

The consequences of parasitic diseases in children are mainly malnutrition and poor growth. In fact, parasites affect the individual presenting symptoms such as diarrhea, anemia, nausea, intestinal pain, lack of appetite, irritability, and increased susceptibility to other infections (3). The occurrence of parasitic diseases in Brazil is high as much as in developing countries. However, frequency levels vary according to the regions of each country, their socioeconomic conditions, basic sanitation, education and hygienic practices of each individual (6).

Parasites can be acquired by ingestion of eggs, cysts, larvae and adults of helminths and protozoa that are easily found in the soil, eggs and cysts can be carried even by dust to food, as well as being carried by water streams (7). Another form of contamination is to carry dirty hands directly into the mouth, and also by larvae that penetrate directly into the skin (8).

The lack of knowledge of the population about parasitic diseases, especially the poorest populations, is an aggravating factor for the spread of parasitic diseases. For, these individuals are mostly unaware of the damage that parasites cause to health, not making use of prophylactic measures.

There are three forms of disease prevention: Primary prevention is the prophylactic ways to control, secondary prevention measures that act to prevent the spread of disease, and tertiary prevention that aims to prevent the population's disability (9).

Health management programs are implemented to combat parasitic diseases; however, the results are not satisfactory; there is a lack of actions that involve the population more in an awareness process (10). WHO advocates health promotion, whose main component is the development of personal and collective skills to improve the quality of life and health of the community (11).

Based on the literature consulted it is noted that intestinal parasitosis in Brazil have a high prevalence, which leads to the need for studies that reveal the society all the necessary information. In view of this, the present work had as objective to

provide a result to the population of the municipality of Tavares, PB, Brazil, on the parasitic diseases that most affect them, and thus to draw a parasitic epidemiological profile of the municipality.

Evidenciating the importance of this research that will serve for the entire population as a vehicle of information and knowledge. In order to raise the awareness of individuals about the methods of prevention and recognition of risk factors to combat these infectious diseases.

The objectives and interests of research are based on ethical standards (norms and directives regulating research involving human beings - RES. CNS n ° 466/12 and operational norm 001/2013).

2 MATERIAL AND METHODS

2.1 Data Collect

The present study was carried out through the collection of data from parasitological exams, based on the results recorded in archives of the Diagnostic and Clinical Analysis Center-CEDIACLIN, in the city of Tavares-PB, seen in Figure 1.



Figure 1. Diagnostic and Clinical Analysis Center-CEDIACLIN

Source: Authors.

The data were recorded in writing, in the descriptive research typology with a quantitative approach, and an analysis was performed to trace the parasitic epidemiological profile of the municipality.

The method applied to parasitological diagnosis is the method of Hoffman, Pons and Janer, also known as Lutz method.

The results analyzed were from January 2013 to December 2015, they were separated into positive and negative parasitological exams. Subsequently we analyzed the parasites found and their frequency in the positive results. This frequency of cases was also observed according to the sex of the patient and the species of the parasite being also evaluated the rates of monoparasitism and polyparasitism.

The data were analyzed using Microsoft Excel® software, version 2013, where the results were expressed in tables and graphs, being compared with the specific literature.

2.2 Study Area

The present study was carried out in the municipality of Tavares, located in the state of Paraíba, located in the micro-region of Serra do Teixeira, which can be seen in Figure 2. The municipality extends over a territorial area of 229 km², with an altitude of 724 meters, its geographical coordinates are, Latitude 07 ° 38 '09' 'S, Longitude 37 ° 52' 42 "W. It is located at a distance of 429 km from the capital João Pessoa. In the last sense its population was of 14,103 inhabitants, with its population density of 59,42 hab / Km². It has a hot and humid climate with summer-fall rains and a drought period of five to seven months, with an average annual rainfall of 1100 mm, data from the Brazilian Institute of Geography and Statistics (11).



Figure 2. Location, Tavares, Paraíba.

Source: IBGE, 2010.

The municipality has eight SUS health facilities (11), among them the José Leite da Silva Regional Hospital, seen in Figure 3, which serves the entire Tavares population.



Figure 3. José Leite da Silva Regional Hospital

Municipal sanitation, joint management of water treatment, sewage, stormwater management and cleaning, are formed by the water supply system that specifically caters to urban dwellers with treated water, and programs are adopted for the rural population. family monitoring and distribution of chlorine. Thus, as the sewage network only exists in the urban environment (11).

3 RESULTS AND DISCUSSION

During the periods from January 2013 to December 2015, there were 1,437 parasitological exams of feces. Of these, 928 (64.60%) presented positive results and 509 (35.40%) were negative, as shown in Figure 4.

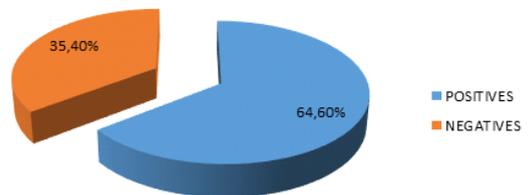


Figure 4. Comparison between parasitized and non-parasitized samples (N = 1,437)

The high prevalence of intestinal parasitosis in Brazil is due to the conditions of basic sanitation and the lack of execution of projects for the transfer of information that help in the prevention of the transmission of the parasites, as well as for the awareness of the population.

The percentage of positive cases in the current study is similar to the results of a study carried out in a Health Center in Belo Horizonte, Minas Gerais, Brazil. Of the 1,850 samples evaluated, 62.3% presented positive results and 37.7% presented negative results (12), evidencing a high positive percentage than those obtained in other studies. Data from Bom Jesus dos Perdões, SP, Brazil, for a sample of 2,524 individuals, indicated that 15.69% presented positive cases for parasitosis (13).

A survey of users of the Unified Health System (SUS), in Limoeiro do Norte, CE, for a sample of 1,266 patients, 23.3% were positive

(14), attesting that the data revealed in the municipality of Tavares, PB, of 64.60% positive, is to an alarming degree, evidencing the need for the implementation of health management programs, which will provide the population with the information necessary for such a high reduction to occur.

In Figure 5, of the 928 positive results, 560 (60.30%) presented polyparasitosis and 368 (39.70%) monoparasitosis. That is, a prevalence of more than one intestinal parasite per individual.

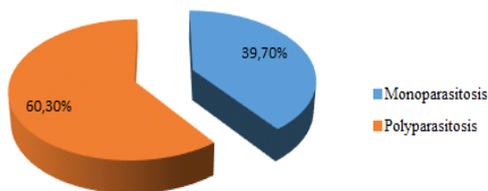


Figure 5. Comparison between cases of monoparasitosis and polyparasitosis (N = 928)

Relating the data of Figure 5 to a work on Prevalence of parasitosis carried out in the city of Água Branca, PB, in which of the 630 positive results, 548 (86.98%) presented monoparasitosis pictures (15).

Among the positive results were also described, the genus that had the greatest presence of parasitosis, as shown in Figure 6, a higher frequency in females, with 64.44% and only 35.56% for males.

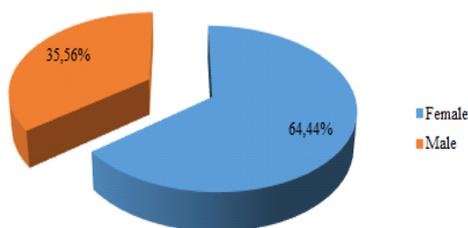


Figure 6. Prevalence of positive cases, according to sex (N = 928)

In a study carried out in the city of Manaus, AM, it was shown that 53.1% were female and 46.9% male, from the parasitized samples analyzed (16).

The demonstration of the majority of studies pointing to a higher prevalence in women is due to some factors, such as health care, which makes them seek more medical care, and also to the fact that they are always in environments more conducive to transmission of parasites.

Of the etiological agents of the intestinal parasitoses identified in the parasitological examinations, *Endolimax nana* was distinguished between protozoa and *Ascaris lumbricoides* among the helminths.

E. nana is characterized by not being pathogenic, in other words, a commensal amoeba, its transmission occurs by the ingestion of mature cysts, found in untreated water and poorly washed fruits contaminated by the cyst. The prevention of this parasite is pertinent to health education, as well as to stimulate the population to carry out preventive examinations, with the purpose of detecting the parasites and treating them, in order to avoid their propagation (17).

A. lumbricoides is one of the intestinal helminths that most affects humans, its high prevalence is related to precarious sanitary conditions, type of community (urban/rural), socioeconomic level, age, lack of hygiene, nutritional status and degree of education, occurring mainly in temperate and tropical regions (18).

In Table 1, it is possible to observe the prevalence of intestinal parasites divided by parasite and from most frequent to less frequent.

Table 1. Prevalence of intestinal parasites in the results of parasitological exams of feces performed in the municipality of Tavares, from January 2013 to December 2015.

Parasite	Intensity of Parasitism	
	Quantitative of cases	Frequency
<i>Endolimax nana</i>	380	41%
<i>Entamoeba coli</i>	192	20,7%
<i>E. histolytica</i>	172	18,6%
<i>Giardia lamblia</i>	82	8,9%
<i>Iodamoeba butschlii</i>	46	4,6%
<i>Ascaris lumbricoides</i>	28	3%
<i>Enterobius vermiculares</i>	15	1,7%
<i>Trichocephalus trichiurus</i>	7	0,8%
<i>Hymenolepis nana</i>	6	0,7%

Separating into protozosis and helminthiasis, the incidence ratio of the sample is identified, where 93.50% correspond to patients with protozoa, a low percentage of 5.30% for helminths, and only 1.20% presents an association between the two intestinal parasites.

Associating the prevalence of protozoa, as shown in Figure 7, with a study in the municipality of Limoeiro do Norte, CE, where protozoa were the most frequent with a quantitative of 98.5% (19).

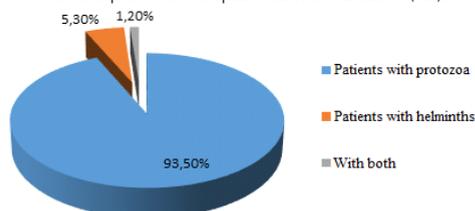


Figure 7. Distribution of protozosis and helminthiasis found in infected patients and parasite association in these individuals.

The high rate of parasitism due to protozooses and helminthiasis is due to the lack of sanitation and the socioeconomic conditions that the population is in, and these are some of the main factors motivating the spread of parasites (20).

In Figure 8 and 9 is illustrated the protozoans and helminths that prevailed in the study, showed in the cyst form for the protozoa and in the egg form for the helminths.

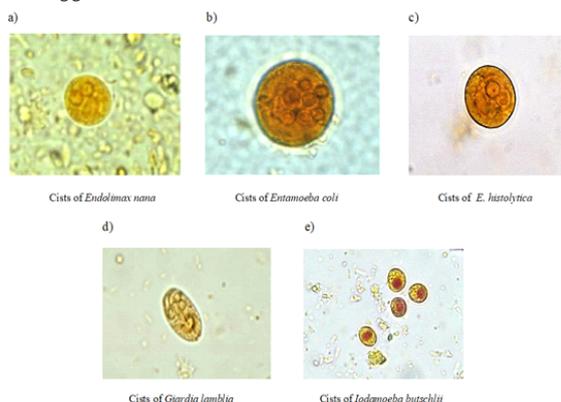
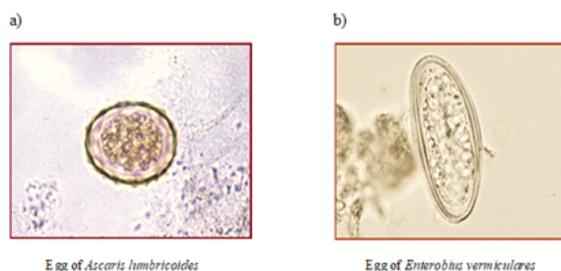
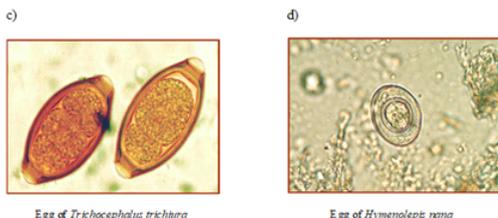


Figure 8. Protozoans that prevailed in the study population.





Egg of *Trichocephalus trichiro*

Egg of *Hymenolepis nana*

In order to evaluate the level of information, prevention, hygiene, housing conditions, food hygiene, among other issues, a simple questionnaire was applied.

This questionnaire had nineteen questions, of which seven were considered of greater relevance for the study. The answers for the questions can be seen in Table 2.

Table 2. Percentages obtained through the answers of the highest value questions in the questionnaire.

QUESTIONS	YES	NO
Have you ever had parasitic treatment?	36%	64%
Do you do stool tests often?	27%	73%
On your street, is there open sewage?	36%	64%
Is there basic sanitation on your street?	67%	33%
Does your house have a cesspool?	71%	29%
Is the water in your house filtered?	79%	21%
Is your household food washed with filtered water?	77%	23%

Health education is seen as a method for the prevention of parasitological diseases, so it is necessary to practice this in the school and family environment, since there is an awareness of the causes and consequences of the community in terms of preventive methods. Thus, it is incontestable to carry out more work to raise awareness of the population so that there is no greater spread of these infections, as well as a significant reduction in parasitism levels.

In a study carried out in Cascavel, PR, health education was used as an instrument to prevent parasitosis, the sample population studied, before the preventive measures showed a positive 36.8%, and sometime after the execution of the project the same individuals were again evaluated, showing a significant reduction, with a frequency of 13.04% (21).

4 CONCLUSION

Based on the analyzed data, it is noted that the etiological agent of the most frequent intestinal parasitosis in the human population of the municipality of Tavares-PB, Brazil, was *E. nana* for protozoa and *A. lumbricoides* for helminths. Parasitosis had a higher frequency in females, and the degree of polyparasitism was higher than that of monoparasitism.

The data collected in this study reveal a high percentage of intestinal parasitosis in the population of Tavares-PB, Brazil, indicating a serious problem in public health and attesting to the importance of knowledge of prophylactic measures for the control and prevention of intestinal parasitosis. In these perspectives, this work becomes relevant to the knowledge of the actual parasitic epidemiological situation of the population and has a magnitude, since there are still no records of such studies carried out in the municipality, even though it is of great relevance for public health.

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