Prevalence of intestinal parasites of the human population in the City of Pombal-PB, Brazil

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The intestinal parasitic diseases caused by protozoa and helminths are infestations that may trigger changes in the physical, psychosomatic and social state of patients, directly interfering with their quality of life. The aim of this study is to determine the major intestinal parasites causing diseases that are distributed in the City of Pombal-PB, either in endemic or epidemic form, and to observe the incidence/prevalence and factors that favor the proliferation of these parasites so that they can be diagnosed, controlled or treated. The study was developed by quantitative method. The data were collected from sample collection made in the Diagnosis Health Unit Laboratory of Dr. Avelino Elias Queiroga in the City of Pombal-PB. They were stored in medical records used in internal control from January 2012 to December 2013. From a total of 3,144 surveys analyzed, 29% had parasites (Endolimax nana the most common protozoan with 35.72% and Hymenolepis nana with 0.29% among helminthes). Among the results of positive tests for parasites, 8% had poliparasitose frame, 53% had monoparasitose and 39% had biparasitose. The results of this study demonstrate the need for the population to be aware of the importance of diagnosis, treatment and follow-up of positive cases.

Key words: Intestinal parasitosis, prevalence, helminths, protozoa.

INTRODUCTION

The incidence of intestinal parasites is a serious public health problem worldwide (Mamus et al., 2008). In Brazil, these diseases occur in different regions of the country, whether in rural or urban areas and in different age groups (Monteiro et al., 2009; Fonseca et al., 2010). These conditions correlate with lower socioeconomic status and poor sanitation conditions, representing a scourge, particularly for the poorest populations (Grillo et al., 2000). The parasite (an aggressive agent) and the host (shelter and food source) establish an association where only the first one benefits while the other is always impaired (Neves, 2000). Parasitism is a reflection of the

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host-parasite fight, which depends on the result of forces at work, the parasite mechanisms of aggression and host defense (Cimerman, and Cimerman, 2001). These parasites are part of life and thus need to be known vastly, not only in terms of environmental and socially (Neves, 2011). The intestinal parasitic diseases caused by protozoa and helminths affect children from lower social classes, and those with poor sanitary conditions and malnutrition; they also affect kindergartens, schools, nursing homes and orphanages, with ease of contamination and dissemination (Zaiden et al., 2008).

The transmission of parasitic diseases is generally oro-fecal, that is, by ingestion of helminth eggs and cysts of protozoa present in food, water or even in some contaminated object with feces, or ingestion of these forms through dirty hands or fecal waste. Asymptomatic individuals, who are in direct contact with food, may become potential source of contamination of various pathogens, especially enteroparasites (Roberts, 2005). Intestinal parasites can cause a lot of harm to their sufferers. The most common clinical manifestations caused by intestinal parasites in the host, are diarrhea, gastrointestinal bleeding, anemia, weight loss, abdominal pain, anxiety, nervousness, restlessness and, in critical situations, death (de Souza Abraham et al., 2007). Although intestinal parasites are ignored, it is necessary to implement measures to reduce the number of infected individuals, measures that are able to stop the transmission mechanisms. For this to occur, it is crucial to know the prevalent species of each site. The combination of these measures enables a possible improvement of the population's living conditions, thus reducing the progression to more severe disease (Goia, 2007). Thus, the present study aims to determine the main intestinal parasites causing diseases that are distributed in the City of Pombal-PB, either in endemic or epidemic form, and to observe the incidence/prevalence and factors that favor the proliferation of these parasites so that they can be diagnosed, controlled or treated.

MATERIALS AND METHODS

Study area

The study was conducted in the City of Pombal, Paraíba (Figure 1), located in the Western region of the state of Paraíba, mesoregion Hinterland and Microregion Sousa; it is about 371 km from the capital, João Pessoa. The annual average temperature is 27°C, with monthly averages varying from each other a bit. It is one of the oldest and second largest in the state with 889 km². It has an annual growth rate of 1.86%, has the 15th highest HDI of Paraíba, and life expectancy in the city is on average 66.2 years. Its population is over 33,000 inhabitants (IBGE, 2010). The health facilities in the City of Pombal-PB are 90% municipal, 10% private and there is no presence of state and federal health agencies. It has a regional hospital, Polyclinic Dr. Avelino Elias Queiroga and Emergency Unit that work for 24 h (UPA). Sanitary sewage project of Pombal is composed of several stages, due to the volume of service and high cost of the work, because the proposal is to meet the entire urban area. Running the first and second stages of the sewage entails the following: household connections: 6.775 m; catch network: 11.305, 26 m; collection station and discharge outfall network: 3.850 m; treatment station and final emissary: 1.864 m.

Data collection

This study was developed by quantitative method. Data were collected from sample collection in the Health Unit of Laboratory Diagnosis, Dr. Avelino Queiroga of the City of Pombal-PB. They were stored in medical records used in internal control from January 2012 to December 2013. The method used for diagnosis of the samples was Hoffman; it was used for the detection of cysts, oocysts, eggs and larvae. It is a spontaneous sedimentation in

![Figure 1. Location of the city of Pombal in the state of Paraíba.](image)
The data were separated into positive and negative, and then the parasites and their frequency were analyzed in the results. They were separated based on the gender of the patient. Microsoft Excel for database assembly was used, and the data collected were analyzed. Statistical analysis was done quantitatively and qualitatively, which led to the justifications of the data obtained. The project was submitted to Brazil Platform, where the development of the research did not go against Article 196/96 on research ethics code with humans.

RESULTS

Three thousand one hundred and forty-four (3,144) results of parasitological examinations of stools (EPF) were analyzed from January 2012 to December 2013 in the City of Pombal-PB. Of the 3,144 results analyzed, 29% was positive for intestinal parasites and 71% was negative (Figure 2). The data (Figure 3) show that the prevalence of intestinal parasites in the blood tests based on gender was predominant for females, both negative (70.05%) and positive (70.54%). Then, it appears that there is a real difference between the genders of the patients seen at Polyclinic Dr. Avelino de Queiroga in the City of Pombal-PB. According to the 910 positive results (Figure 4), 1% of patients had intestinal helminth infections; 99% showed only the presence of protozoa. Regarding infections, the data show that monoparasitose prevailed in the cases of patients studied (55%) compared to the others. While biparasitose and polyparasitose had 38 and 7% of parasites present in the tests studied (Figure 5).

Figure 6 shows the frequencies of each species found. One can analyze the images of the types of parasites found in the studied population; they are in the form of eggs for helminth and protozoan cysts (Figure 7). The sum of the frequencies was 100% due to cases of multiple
Figure 4. Distribution of protozoa and helminths found in infected patients and parasitic association in the same individuals, performed between January 2012 to December 2013.

Figure 5. Characterization of helminths and protozoa of individuals in the study.

Figure 6. Distribution of species of parasites, from January 2012 to December 2013.
parasitic infections. Among the species of intestinal parasites found in the examination of fecal samples of surveyed individuals, protozoa (Endolimax nana (35.72%) and Entamoeba coli (34.14%)) were more frequent than helminths. Among the helminths, Hymenolepis nana was the most frequent (0.29%). Comparing the years, it appears that 2012 was predominantly used for test than 2013 (Figure 8). The data showed that in 2012, the results of the positive and negative tests were higher compared to that of year 2013. In Figure 9, we can see that when comparing 2012 and 2013 years studied, monoparasitose had higher percentage in 2013 than in 2012, with a value of 57%. Both biparasitose (39%) and poliparasitose (8%) had higher percentages in 2012.

Figure 10 shows the comparison of sex of individuals in 2012 and 2013. In 2012, males (58%) had higher percentage than females, while in 2013, females (44%) had higher one than males. Figure 11 shows the comparison of intestinal parasites separated by year, noting that all parasitic species were higher in 2012.

DISCUSSION

In the development of this work, it was found that these parasites over the years continue to be an important disease in the country, affecting individuals of all genders and ages. The highest percentages of prevalence of
intestinal parasites were observed in female individuals (70%), thereby detecting differences between the genders of individuals treated at Polyclinic Dr. Avelino Elias Queiroga in the City of Pombal-PB. According to Gomes et al. (2007), the discrepancy in demand for health services related to gender shows that women seek access to basic care more than men. Thus, this high prevalence is evident among women, observing that men use primary health care services less. This seems to occur because the culture of the society reaffirms the belief that man does not need prophylaxis and care (Costa et al., 2012). Gomes et al. (2007) showed that men are more affected by chronic diseases and often severe compared to women. The mortality rate for the same situations is greater. Even with these significant data, it is observed that men attend less of primary health care services, this seems to occur because the culture of the society reaffirms the belief that man does not need prophylaxis and care (Menezes, 2013).

From the data analyzed in this study, the prevalence of protozoal infections (99%) was higher than that of helminths (1%) in infected individuals; and the same prevalence of parasites was found in the study of Amorim et al. (2013), where protozoan infections were more frequent (32.7%) than helminths (5.4%). The prevalence rates found for protozoa are as follows: Endolimax nana (35.72%), Entamoeba coli (34.14%), Entamoeba histolytica (15.32%), Giardia lamblia (9.89%), Iodamoeba butschlii (4.01%). For intestinal helminthes, the following prevalence was found: Hymenolepis nana (0.29%), Ascaris lumbricoides (0.14%), Trichuris trichiura (0.14%), Enterobius vermiculares (0.07%), Schistosoma mansoni
(0.07%) and Ancilostomídeos (0.07%), Ancylostoma duodenale (0.07%) and Strongyloides stercoralys (0.07%). Regarding the characterization of intestinal parasites, the data analyzed show that monoparasitose prevails in the cases of patients studied (Figure 5). The occurrence of individuals presenting monoparasitose, biparasitose and polyparasitose in epidemiological studies is common because of the spread of these intestinal parasites and the ease with which they are transmitted (Armengol et al., 1997). Considering that the forms of transmission of these parasites occur particularly through contaminated water and food, it is fundamental to do a reassessment of the current frame of parasitosis, seeking to identify the causes and sources of contamination (Armengol et al., 1997). In 2012, there was a higher prevalence of positive tests for some kinds of parasites (Figure 10). This is due to greater realization of tests in this year; in 2013, there was a reduction in these examinations due to demand from individuals. It can also be included in this study, that 2012 was where all the parasitic species were higher than the year 2013 (Figure 12).

**Conclusion**

Despite the fact that the prevalence values are lower than those of other studies, these data are worrying. It is noticed that the positivity of the tests are due to lack of personal hygiene, sanitation and not knowing clearly the vermin that causes contamination. Given the results, it is clear that there is the need to implement public policies for sanitation, education and health of the population to control the intestinal parasites.

**Conflict of interests**

The authors have not declared any conflict of interests.
Figure 12. Comparison of the parasitic species separated by year.

REFERENCES


