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INTESTINAL PARASITOSIS IN PUBLIC SCHOOL STUDENTS IN THE MUNICIPALITY OF CASCAVEL – PR

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Abstract: Parasitosis are neglected diseases related to the sanitary and socioeconomic conditions of the place. Intestinal parasites mainly affect school-age children because their hygiene habits are often inadequate and their immunity is still developing, which makes it difficult to eliminate the parasites. These diseases can be insidious with few signs and symptoms, but they can also worsen malnutrition, diarrhea, anemia, reduced physical development and school performance of children. Thus, the objective of this research was to analyze the feces of school children from kindergarten and elementary school I to define the prevalence of parasites in this population and seek control through adequate treatment and dynamics of education on parasitic prevention. The methodologies used were: Lutz/Hoffmann, Pons and Janer; Faust et al. and the fresh direct examination. The following parasites were identified: Blastocystis hominis (42.9%), Entamoeba coli (28.6%), Giardia lamblia (14.3%), Endolimax nana (14.3%) and Taenia sp. (1.3%). The treatment was carried out in Basic Health Units close to each teaching institution and recreational and informative activities were applied to children, parents and guardians, in addition to teaching teams, aiming at controlling these infections.
Keywords: school children, public health, enteroparasites.

INTRODUCTION

Parasitic infections are part of a group of diseases considered by the WHO (World Health Organization) as neglected, although they also affect developed countries, they are related to the health, education and socioeconomic conditions of a certain population and, therefore, a public health problem (Liu et al., 2012).

Children, especially of school age, are more vulnerable to being infected by parasites due to the immaturity of its immune response, which is not fully formed (Andrade et al., 2017). in addition, this population is more likely to maintain unhygienic habits by coming into contact with contaminated water and food, in addition to attending day care centers or schools and maintaining close contact with other children that may contribute to a greater chance of transmission of pathogens (Montresor et al., 2002).

Among the main agents that affect children, the helminths stand out: Ascaris lumbricoides, Trichuris trichiura and Hookworms, as well as the protozoa Entamoeba histolytica and Giardia lamblia (Biasi et al., 2010). In addition, there are other important parasites such as Cryptosporidium spp., Strongyloides stercoralis and Enterobius vermicularis, the latter two of which are more difficult to find because of their life cycle (Incerti, 2013).

Giardiasis is one of the main parasites identified in childhood in various regions of the world, it can have an insidious course or present with chronic or acute self-limited diarrhea with steatorrhea, abdominal discomfort, gas, explosive diarrhea and a foul odor. If left untreated, vitamin malabsorption syndrome may occur, especially fat-soluble ones (Bezzagio, 2021).

Entamoeba histolytica infection can have several clinical presentations, from forms that exclusively affect the gastrointestinal tract related to chronic inflammation and diarrhea to conditions in which the amoeba spreads to other body tissues. Therefore, although it may be asymptomatic in some cases, it is an amoeba with a well-established pathogenesis and which can cause complications even in CNS tissues (Central Nervous System).

Geohelminths are very prevalent agents in the world, the WHO estimates that about a quarter of the population is infected with some parasite of the group (Ascaris, Trichuris, Hookworms), they do not usually

cause very specific symptoms, except when they evolve into more serious forms such as rectal prolapse in trichuriasis; evacuation with larvae in the stool or constipation due to obstruction of the intestinal flow by a tangle of worms inside the intestine (ascariasis); in the case of Hookworms there may beanemia accompanied by eosinophilia in the blood count without any other cause justifying this alteration. Above all, despite the nonspecific symptomatology, the coproparasitological examination is capable of detecting all these parasites, being useful in the screening of parasites (Neves et al, 2016).

Thus, we sought to evaluate the parasitological profile of children who attend education centers and public schools in Cascavel, Paraná, seeking to control intestinal parasites through appropriate treatment and health education.

MATERIALS AND METHODS

From July 2019 to June 2023, in Cascavel/PR, parasitological examination was carried out on samples from CMEI (``Centro Municipal de Ensino Infantil``) and municipal schools for children aged zero to twelve years. To collect the material, a message was sent explaining the research to the parents or guardians and then bottles were made with identification, collection instructions and return date for each group of children, and only those who signed the Term of Acceptance participated in the research. Free and Informed Consent (TCLE). During the study, the Research Ethics Committee of UNIOESTE was approved, and, in forceat the moment it is opinion 5,524,803/2022.

The material was collected at home by parents and/or guardians and the materials were transported in a thermal box to the Laboratory of Clinical Parasitology at LACEPE (Laboratório de Ensino, Pesquisa e Extension - UNIOESTE) to be stored under refrigeration and subsequently analyzed.

For microscopic analysis, the methods of Faust et al. (1934), Lutz/Hoffmann (1939) and fresh examination (confirmation of Blastocystis hominis cysts) were used (Figure1). Slides were prepared with samples stained with Lugol's solution. and observed under the microscope using 10X and 40X objectives (Cunha, 2021).

RESULTS AND DISCUSSION)

Cascavel is a Brazilian municipality located in the western region of the state of Paraná, southern Brazil, with a subtropical climate and with 336,073 inhabitants (IBGE, 2021).

During the execution of the research, it was noted that the students' adherence was not high, regardless of the educational institution, so more than one collection attempt was made in each class, seeking to increase representativeness.

A total of 75 samples were collected, of which 25.3% (n=19) were positive for some parasite and among these 2.7% (n=2) had polyparasitism.

As it can be seen in Table 1, Blastocystis hominis was the most frequent parasite in this study. It is a protozoan that little is known about its pathogenicity, biological cycle, organelles, transmission routes and even taxonomy. However, phylogenetics have already differentiated 12 different species of B. hominis in men and animals, its pathogenicity may be associated with situations of immunosuppression and transplantation, in addition to there being evidence that it is found more frequently in patients with irritable bowel syndrome, although there are cases of patients without risk factors with symptoms. In developed countries, its prevalence can reach up to one positive case in every ten people, while in developing countries it can reach half of the population with the presence of B. hominis in feces (Neves et al, 2016).

PARASITE	NUMBER OF SAMPLES	PREVALENCE (%)
Blastocystis hominis	32	42,9
Entamoeba coli	22	28,6
Endolimax nana	12	14,3
Giardia lamblia	12	14,3
Taenia sp	1	1,3
TOTAL	75	100

*We must consider cases of polyparasitism in two samples

Table 1. Prevalence of intestinal parasites identified in the feces of children in early childhood education and elementary school1 in public schools in Cascavel - PR. 2023.

Figure 2: Health education activities with elementary and early childhood education students in educational institutions in Cascavel – PR – 2023.

Entamoeba coli had a prevalence of 28.6% and Endolimax nana 14.3% in the population of this study and despite being non-pathogenic species for humans, it must be reported in the test result as it indicates ingestion of material contaminated with cysts and/or eggs of parasites. Transmission is fecal-oral and can occur through contaminated water and/or vegetables that have not been properly cleaned, like other protozoa whose pathogenesis is established in the literature, such as Giardia lamblia and Entamoeba histolytic *here* (Rech et al., 2016; Antunes & Santos de Bona, 2017).

Giardia licking was identified in 14.3% of samples, being an important protozoan related to greasy diarrhea that can lead to hypovitaminosis and malnutrition, although they only appear when the infection is symptomatic. The transmission of giardiasis is fecal-oral and often occurs through contaminated water (De Morais et al, 1996), in addition, the cysts are resistant to chlorine added to treated water (WHO, 2009).

Above all, Entamoeba coli, Endolimax nana and Giardia lamblia are similar in the form of contagion, considering that contamination by these protozoa is fecal-oral. Therefore, their prevalence can be used as indicators of the health conditions of a given population (Pedraza et al., 2014). Furthermore, the parasites identified in this study have a prevalence similar to that described in the Brazilian literature (Vieira et al, 2021).

Taeniasis is caused by the adult form of Taenia solium or Taenia saginata in the intestine of the host. The transmission of taeniasis occurs when humans, who are the definitive hosts, ingest pork or beef, raw or undercooked, that is infected by the cysticercus of each species of Taenia (Neves, 2016; Santana et al, 2021).

A high frequency of protozoa was observed in this study, corresponding to 94.7% of the positive samples, which shows a change in the characteristics of the epidemiology of parasitic infections in the pediatric population, when compared to studies from decades ago (Boeira et al., 2000; Uchoa et al, 2001; Ferreira et al., 2004; Monteiro et al, 2010). This can be conditioned to better hygienic-sanitary conditions of urban populations, as well as to empirically carried out treatments against verminoses, with action directed against geo-helminths (Lenartovicz-Boeira et al., 2021).

At the end of the analysis, reports were delivered for positive cases with a referral letter to the doctor at the UBS/USF (Basic Health Unit/Family Health Unit) closest to the educational institution. To explain how transmission occurs, for children aged five years and older, an animated video was shown in each classroom, in addition to dynamics with children using age-appropriate didactic games, which reinforce the measures of transmission. parasitic prophylaxis (Figure 2). Educational material was sent to parents or guardians of children under five years of age, as well as to the teaching institution's staff, through social media, in order to guide care with food, water consumption and hygiene.

CONCLUSION

Treatment measures associated with health education are effective for controlling diseases such as intestinal parasites, in addition, the school is a conducive environment for the dissemination of knowledge, from small schoolchildren.

During the research it was possible to observe that the identified parasites show prevalence according to what is described in Brazil. However, as there is a strong relationship between parasites and sanitary and hygienic conditions, it is unequivocal to emphasize that constant health education is essential to reduce diseases in children who are in a period of physical and intellectual development and need to have a good nutritional status.

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