

Intestinal parasitoses in children residents in DAREI orphanage, Manhuaçu city, Province of Minas Gerais, Brazil

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Abstract- Enteroparasites are helminths and protozoa that colonize the intestine of vertebrates and constitute one of the great problems of global public health. Parasitoses may interfere with the nutritional status and the growth of the infected ones, compromising the intellectual development of the children and reflecting on low rate of school achievement. **Objective:** perform a parasitological survey in children living at the DAREI orphanage. **Materials and methods:** 28 stool samples, representing the universal population, were examined. The sample of each child was preserved in Merthiolate-Iodine-Formol (MIF) solution and laboratory tests were performed at the Laboratory of Parasite Diseases of the Manhuaçu Management Sciences School (FACIG). The research used technique of Hoffman, Pons & Janer for parasites identification. **Results:** There were found infections by the nematode helminth species *Ascaris lumbricoides* and *Trichuris trichiura*, the cestoid of the species *Hymenolepis nana*, and protozoa of the species *Giardia lamblia* and *Entamoeba coli*. Five stool samples (18.6%) were positive to enteroparasites. This research contributed to know the parasitoses which affects children of the orphanage and was the base for appropriate medication intervention.

Index Terms- Parasitic diseases, enteroparasitoses, children parasitism, orphanage.

I. INTRODUCTION

The worldwide frequency of enteroparasites and the harmful consequences of the parasitic diseases to the human body make them considered a serious global public health problem. The prevalence rates are directly associated with the environmental, social, economic, cultural and educational conditions of the infected populations. High rates are generally associated to environment problems like water or soil pollution and consumed food contamination^{1,2}.

Intestinal parasites are considered one of the main debilitating factors of the population, often associated with chronic diarrhea and malnutrition, compromising the physical and intellectual development of the younger age groups of the population³. According to Franco & Cordeiro⁴, inexperienced professionals

who attend schoolchildren predispose them to infection risks, being an important factor for the maintenance of parasitism rates. Coelho⁵ *et al.* evidenced the presence of eggs and larvae of helminths in pre-school sanitation facilities and concluded that is mandatory to prepare people who work with this public in the maintenance of hygiene and prevention methods in environments frequented by children.

Parasitic diseases affect more frequently children and teenagers and, depending on the parasite, may interfere with the nutritional status and the growth development of the infected host, leading to decrease of the intellectuality with reflections on the low rate of school achievement^{3,6,7}. Enteroparasites may infect asymptomatic or induce diverse clinical manifestations with characteristic symptoms, and parasitic infections. Parasitic infections are worrisome among immunocompromised patients⁸. Sole enteroparasites that affect the individual do not generally cause high lethality, but some isolated or associated infections can affect nutritional balance, induce intestinal bleeding, promote nutrient malabsorption, compete for micronutrient absorption, reduce food intake or cause surgical complications such as rectal prolapse, obstruction and intestinal abscess or acting through several mechanisms, among them the general weaken and allergen action. As a result of the spiking action, iron deficiency anemia may occur, which in adults occasionally leads to decreased reproductive capacity^{1,9}.

The World Health Organization estimated that there are 1,38x10⁹ people in the world parasitized by *Ascaris lumbricoides* and 250x10⁶ of them are diseased; 1.25x10⁹ are parasitized by hookworms, which 151x10⁶ are sick; 45.5x10⁶ cases of tricuriosis; 1.7x10⁶ cases of onchocerciasis¹. These parasitoses are important public health problems because, besides the constantly life and well-being threatening of a large part of the population, can cause considerable economic losses with health care, productivity reduction or labour incapacitation¹.

This research has the objective to investigate the occurrence of enteroparasites in children living at the DAREI orphanage in the city of Manhuaçu, Province of Minas Gerais, Brazil.

II. MATERIAL AND METHODS

The research was performed in the city of Manhuaçu, Province of Minas Gerais. The city has an area of 627,281 Km² and is located in the region of the Zona da Mata and the micro-region of Manhuaçu. The city is 290 km distant from Belo Horizonte, Province capital. Has an average altitude of 635 meters; tropical climate with rains during the summer and average annual temperature around 21°C. It is geographically inserted in the Doce river basin, being crossed by the Manhuaçu river. Services and coffee production represents the main economic activities of the region. The population is 84,934 inhabitants according to the 2010 IBGE census, with a population density of 135.4 inhabitants/km².

The staffs and the volunteers of DAREI orphanage provide all the necessary requirements to maintain the infrastructure in an excellent condition to children care. The orphanage hosts 28 children with less than eight years old.

This research has a cross-sectional, descriptive and observational design, conducted with children of both genders living at the orphanage. In order to know the diversity of species and the prevalence of enteroparasitoses among children of the orphanage, 28 stool samples were collected, characterizing a universal sample of the population (28 children). The staffs of the orphanage were oriented about the sample collection. Stool aliquots were conserved in Merthiolate-iodine-formaldehyde solution (MIF) and sent to the Laboratory of Research on Parasitic Diseases of the FACIG School of Medicine. The exams were performed using the spontaneous sedimentation method of Hoffman, Pons and Janer. For the diagnosis and to determine the presence of protozoan cysts, helminth eggs and larvae, two preparations of the sediment between slip and coverslip were used for each sample per children and observed under light microscopy with 20X and 40X magnification

III. RESULTS

Among the 28 examined children, we identified infections by nematode helminth of the species *Ascaris lumbricoides* and *Trichuris trichiura*, the cestoid of the species *Hymenolepis nana*, as well as protozoa of the species *Giardia lamblia* and *Entamoeba coli*. Positive cases occurred in five children (18.6%) of those examined.

IV. DISCUSSION AND CONCLUSIONS

Currently there are several diagnostic, treatment and prophylaxis resources for parasitic diseases. Even considering the exponential scientific and technological advances, parasitic diseases still figures as an important object of study and concern, especially in developing countries where researches prove the relation between precarious hygienic-sanitary conditions and poor quality of life of the population with parasitoses^{10,11,12}. Coproparasitological surveys carried out by several researchers show that microbial and parasitic diseases continue to be an important problem against population welfare as a worldwide health risk. The etiological agents of these diseases generally

take advantage of environmental conditions, especially climatic conditions, and continue to affect essentially all age groups in various regions of the planet^{1,13}.

In Brazil, enteroparasitoses are included among the most worrying diseases, considering that such etiological agents affect humans and animals and are aided by ecological conditions. We observed that the micro-region of Manhuaçu also has favorable conditions for the permanence of parasitic agents in the environment and the transmission mechanisms for new hosts.

As well as in other developing countries, the spread of parasitic etiological agents in Brazil is further aggravated by socioeconomic conditions, especially due to the low level of education and the lack of knowledge or practice of good hygiene habits^{14,15}. The researchers Coura³, Oliveira & Chiunchetta⁷ and Miorim-Moraes¹⁶ *et al.* considered that the parasitized people have health damages and complications with reduction of the resistance of the organism and predisposition to infections to other pathogens. Regarding the children population, the authors affirmed that some parasitic agents may be responsible as aggravating factors of malnutrition, poor learning performance among schoolchildren, as well as lack of efficiency performance in workers, as possible consequences of natural indisposition due to parasitic diseases. We confirm the conclusions of these authors, emphasizing, however, that in the children hospitalized in the DAREI orphanage these problems apparently do not occur, perhaps due to the good general health of the children, the adequate food, the continuous assistance by professionals, permanent medical care, besides the orientation of the people who interacted directly with the children, what minimized the effects of microbial and parasitic infections.

Damáσιο *et al.*¹⁷ conducted a research on the prevalence of intestinal parasitoses among schoolchildren in the city of São Mateus, Province of Espírito Santo, Brazil. A total of 221 stool samples were analyzed and the results showed that 52.9% presented cysts or eggs from at least one intestinal parasite species. From the parasited people, 15.4% had polyparasitism and the most frequent association was *Entamoeba coli* and *Entamoeba histolytica/dispar*. The protozoa *Entamoeba coli* and *Giardia lamblia*, and the helminths *Ascaris lumbricoides* and *Ancilostomidae* species were the most frequent parasites in the analyzed feces. Our results with children living at the DAREI orphanage presented a lower percentage than those found by the cited authors, probably due to the fact that they were isolated children with restricted exposure to the environment.

Andrade *et al.*¹⁸ conducted a research on the prevalence of intestinal parasitoses in children at the Municipal Infant Education Center of Campo Mourão, Province of Paraná, Brazil. They analyzed 32 fecal samples by the method of Faust and the method of Hoffmann, Pons & Janer, obtaining 25% positivity for enteroparasitoses. The registered parasites species were *Giardia lamblia*, *Endolimax nana*, *Entamoeba coli* and *Dipylidium caninum*. The authors commented that the hygienic conditions were poor, the water was not filtered and the raw vegetables used for children lunch were washed only with tap water. Among the children, 73% lived with pets in their houses, justifying the presence of *D. caninum*, a dog's parasite that is rarely diagnosed

in humans. These results differ from those found in children hospitalized at the DAREI orphanage, probably due to the different living conditions of the studied groups.

Considering the occurrences and the percentage of hospitalizations of residents in Manhuaçu by list of causes (ICD10), it is important to note that in year of 2010, 256 hospitalizations were registered for infectious and parasitic diseases, 5.2% of the total hospitalizations; in 2011: 195 hospitalizations (4.5%); 2012: 178 (4.1%); 2013: 230 (5.2%). In 2012, with a total of 178 hospitalizations, being 93 were patients from less than one year to nineteen years old¹⁹. These data shows an overview of infectious and parasitic diseases in the city.

This research contributed to identify the parasitic etiology affecting children living at the DAREI orphanage in the city of Manhuaçu. The results served as the basis for adequate prophylactic orientation and specific interventions to treat the found parasitic agents, in order to improve children's health and aiming to eradicate enteroparasitoses among the orphanage internships..

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