


Tricuriasis

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Gabriela Camargo Souza Davi¹, Lúcia Gonçalves Villanova², Mell Esteves Sá Fernandes³, Janaina Sousa Campos Alvarenga⁴, Ângela Cardoso de Alvarenga⁵ and Sara dos Santos Oliveira⁶

ABSTRACT

Introduction: Whipuriasis, from the helminthiasis group, is one of the intestinal parasitoses that are transmitted through contact with soil, ingestion of contaminated water and food. It is highly prevalent in Brazil, especially in the North and Northeast regions. **Objectives:** The chapter focuses on elucidating the topic addressed, deepening clinical and epidemiological aspects and their forms of control. **Etiological agent:** species *Trichuris trichiura*, of the family Trichuridae. **Evolutionary forms:** It has the following evolutionary forms: egg, larva (L1, L2, L3 and L4) and adult worm. **Form of contamination:** The most common form of contamination is through ingestion of eggs, through contact with contaminated soil or contaminated food and water. **Biological cycle:** cycle begins with eggs eliminated in the feces. The eggs remain in the soil, and larvae develop inside and then contaminate water and food that humans can ingest. In humans, the eggs release the larvae that will parasitize and mature in the host's large intestine. **Clinical manifestation:** Patients may be asymptomatic, and when symptomatic, the complaints are abdominal pain, nausea, vomiting, insomnia, and weight loss. In more severe cases of severe intestinal infections, it may present with enterorrhagia and cases of rectal prolapse in children. **Diagnosis:** Performed primarily by parasitological examination of feces. **Treatment:** Done by administering anthelmintics such as Albendazole and Mebendazole. **Prophylaxis:** the prevention of Tricuriasis is done through health education, treatment of the sick, control of the supply of irrigation of fruits and vegetables, as well as the implementation of basic sanitation. **Conclusion:** The chapter addresses the theme of Tricuriasis, going through its clinical manifestations, treatment and forms of control in an updated and in-depth way, in order to provide accessible information, contributing to the improvement of prevention and possible reduction of cases.

Keywords: Tricuriasis, *Trichuris trichiura*, Parasitic disease, Geohemintiasis.

¹ Medical student at PUC Minas.

² Medical student at PUC Minas.

³ Medical student at PUC Minas.

⁴ Dr. in Parasitology, Professor of Medicine at PUC Minas.

⁵ Dr. in Parasitology, Professor of Medicine at the Faculty of Medical Sciences of Minas Gerais.

⁶ Medical student at PUC Minas

INTRODUCTION

Trichuriasis is one of the intestinal parasitic diseases that make up the group of soil-transmitted geohelminthiases or helminthiases, where contamination of humans occurs through the ingestion of contaminated water and food and contact of hands with infected soil. In this sense, it is highly prevalent in developing countries, such as Brazil, with greater prominence in the North and Northeast regions.

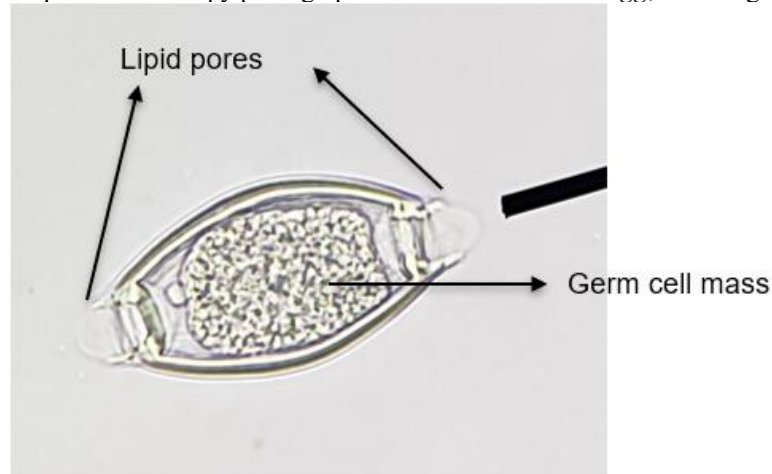
Its etiological agent, *Trichuris trichiura*, is a species of nematode belonging to the family *Trichuridae*, whose individuals have a varied morphology, according to their evolutionary phase in question: egg, larva (L1, L2, L3 and L4) and adult worm.

The disease is a neglected tropical disease, becoming an indicator of the lack of adequate sanitary conditions in the affected areas, being a challenge for public health. In addition, it has benign clinical manifestations, despite possible complications, and presents a treatment based on the prescription of anthelmintic drugs.

EVOLUTIONARY FORMS

The first evolutionary form is the egg, which has an elliptical shape with two lipid pores at the ends and three protective membranes. This evolutionary form can remain viable for years in the soil, under the right conditions of humidity and temperature. The egg has inside a mass of germ cells that, later, already in the environment and under favorable conditions, will develop into larvae. In order for the development in the environment, it is necessary that the eggs are not exposed to direct sunlight, in addition to a clayey or sandy soil and air humidity around 70%. In addition, the temperature of the environment plays a crucial role in the timing of embryonication. In warm regions, the formation of the larva happens more quickly. The egg with the presence of the larva inside is the infective form for humans. Figure 1 shows a photomicrograph of a *Trichuris trichiura* egg without the larva formed.

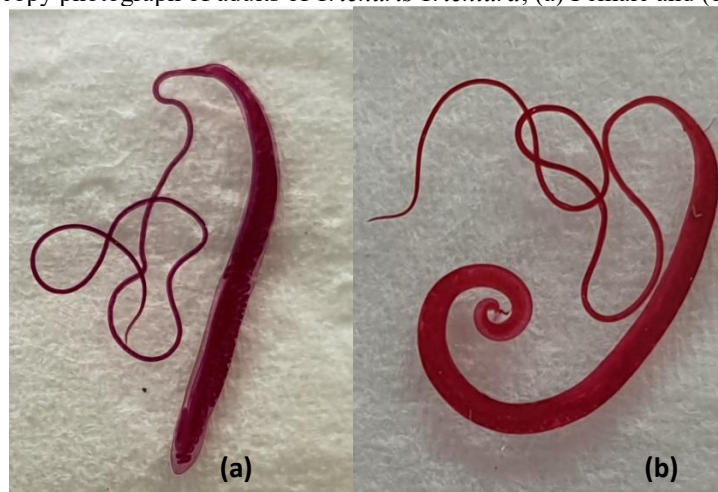
Figure 1- Optical microscopy photograph of *Trichuris Trichiura* egg, 40X magnification.



Source: Authors' personal collection.

Adult worms measure 3 to 5 cm, have a pinkish-gray color, have a tapered anterior end and carry stocytes, which are esophageal glands responsible for degrading intestinal tissue allowing feeding through interstitial fluids and blood. These worms are sexually dimorphic, with females being larger and with a tapered posterior end, and males smaller and with the posterior end recurved ventrally. They are found parasitizing the large intestine of their hosts, where they behave like tissue parasites, since the esophagus (the thinnest part that corresponds to 2/3 of the size of the worm) is immersed in the intestinal mucosa. Figure 2, a and b, show respectively female and male of *Trichuris trichiura*, visualized under light microscopy.

Figure 2- Optical microscopy photograph of adults of *Trichuris Trichiura*, (a) Female and (b) Male. 4X magnification.



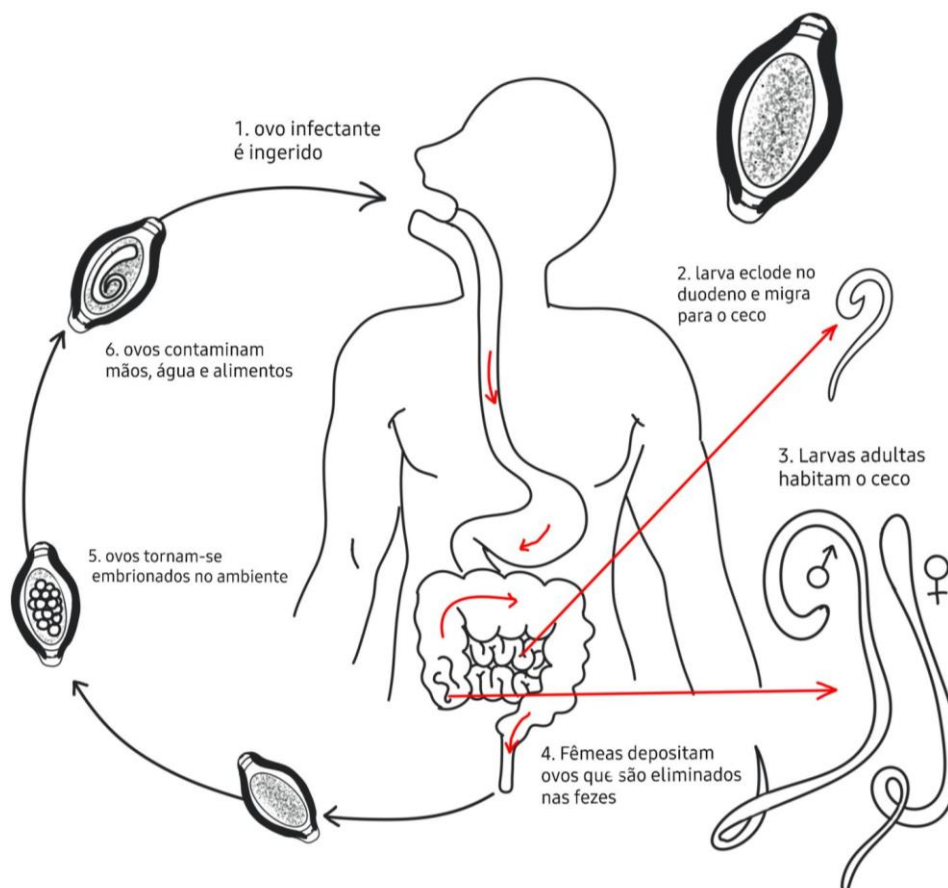
Source: Authors' personal collection.

BIOLOGICAL CYCLE

The cycle begins with the elimination of eggs along with the feces of infected hosts. In the environment, they take 15 to 21 days to develop the larva inside and thus become infectious. Eggs can remain viable in the environment for a long period of time, where they will contaminate waters,

foods such as fruits and vegetables, or the hands of susceptible individuals. After ingestion, by stimulation of gastric and pancreatic juices, the eggs hatch in the duodenum, releasing the larva. This larva will grow and develop between the intestinal villi and then migrate to the cecum and ascending colon, where they will go through the maturation phase – the four larval stages to the adult stage. In the adult stage, the worms have posterior portions, intended for reproduction and egg deposition, and esophageal portions, which are internalized in the intestinal mucosa for ingestion of enterocyte residues lysed by enzymes derived from their stocytes. After reaching sexual maturity, mating occurs and the females begin to release eggs daily, ranging from 3,000 to 7,000 eggs per female/day. Figure 3 shows a schematic drawing of the parasite's evolutionary cycle.

Figure 3 – Schematic drawing representative of the biological cycle of *Trichuris trichiura*. Source: Prepared by the authors.



CLINICAL MANIFESTATIONS

The disease preferentially affects children up to 10 years of age and the presence of clinical manifestations is directly proportional to the parasite load. A large number of infected individuals are asymptomatic. The most common complaints found in symptomatic cases are abdominal pain, nausea, vomiting, insomnia, weight loss, diarrhea. The part of the worms' esophagus immersed in the intestinal mucosa causes irritability in the local nerve endings, leading to a picture of accentuated



tenesmus. In the most severe cases, with a large number of parasites, colitis, dysentery, severe dehydration, enterorrhagia and rectal prolapse occur.

DIAGNOSIS

The diagnosis is made by parasitological examination of feces, where the search for the eggs of the parasite is made. The indirect diagnosis can eventually be made from colonoscopy, where in the observed image several worms are seen adhered to the intestinal wall.

TREATMENT

The treatment to be carried out in patients diagnosed with trichuriasis consists of the use of anthelmintics such as:

Mebendazole: 100 mg, 1 time daily for 3 to 7 days

Albendazole: 400 mg, 1 time daily for 3 to 7 days

Nitazoxanide: 7.5 mg/kg/dose, 2 times daily for 3 days

Ivermectin: 200 mcg/kg for 3 days

The use of albendazole and mebendazole in pregnant women should be avoided because of the possibility of toxicity to the fetus.

PROPHYLAXIS

The most effective strategies for the prevention of trichuriasis consist of health education, treatment of the sick, implementation of the basic sanitation system in all regions, ingestion of boiled or filtered water, adoption of personal hygiene measures and consumption of food, such as fruits and vegetables.



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