

GIARDIASIS: CONTROVERSY SUBJECT AND PREVENTION REQUIREMENTS

Carmen Cătălina IOAN¹, Cornelia URSU²

Email: carmenia_ro@yahoo.com

Abstract

Giardiasis is one of the most common diseases caused by parasites in Romania with a growing prevalence. It is estimated that over 20% of the population is infested with *Giardia Lamblia*. It is an infection caused by *Giardia lamblia* (*Giardia intestinalis* or *Giardia duodenalis*). This is a microscopic organism which attaches to the intestinal mucosa, it multiplies and prevents the absorption of nutrients from food. The parasite is mainly found in contaminated water, toilets, human and animal faeces, dirt from fruit and vegetables, kindergartens, nurseries etc. It is the most common parasite in the world and one of the major causes of diarrhoea and malabsorption; children are most commonly affected, while adults are rarely affected. Some studies have shown that in time it is possible to develop immunity to *Giardia*, that is why adults are much less affected by this parasite. Medical controversies regarding diagnosis and treatment of this disease are largely due to the fact that symptomatology is not perfectly specific. Giardiasis may cause or maintain allergic conditions of the skin, eyes and upper and lower respiratory tract, and the ENT symptoms produced by this disease create issues of differential diagnosis. The survey we conducted at the Military Emergency Hospital Iasi in 2007-2009 on 2015 patients showed that this disease is commonly met in the age group 41-60 years, that dog owners are more prone to carry the parasite and that coprologic tests are very important.

Key words: giardiasis, clinical manifestations, survey, coprologic exam, prevention

The etiologic agent of giardiasis is a pathogen protozoan belonging to the class *Flagellata*, called *Giardia lamblia*, *Giardia enterica* or *Lamblia intestinalis*. Modes of transmission to humans can be digestive (via dirty hands) or food- or water-borne. The incubation period is variable, it starts slowly, slightly progressive (Gherman I. 1993), (Hill D.R., Nash TE., 2009).

In many cases, *Giardia* infection has no acute, obvious symptoms and thus it can be unnoticed in the first phase. Clinical manifestations are characterized by digestive symptoms that may be accompanied by neurosis and allergic phenomena (Grințescu-Mică A., 1982), (Huston C.D., 2006). Medical studies have shown that this etiologic agent has been found in 9-11% cases of patients with chronic diarrhoea (Bolin T.D., Davis A.E., Duncombe V.M., 1982), (Gunasekaran T.S., Hassall E., 1992), in 64 -66% of patients diagnosed with arthritis (LeBlanc C.M., Birdi N., 1999), (Letts M., Davidson D., Lalonde F., 1998), in 62 - 80% of patients with chronic urticaria (Spaulding H.S. Jr., 1990), (Clyne C.A., Eliopoulos G.M., 1989), (Chirilă M., Panaitescu D., Capraru T., 1981), and in 20-30% of those diagnosed with

conjunctivitis or uveitis (Pettoello Mantovani M., Giardino I., Magli A., di Martino L., Guandalini S., 1990), (Corsi A., Nucci C., Knafelz D., Bulgarini D., Di Iorio L., Polito A., De Risi F., Ardenti Morini F., Paone F.M., 1998).

It is important to know, however, that chronic infection with *Giardia* may be the reason why a child is anaemic, has no appetite, is irritable, has allergies, lacks in energy, has sleeping disorders, does not gain weight, etc. Giardiasis may cause or maintain allergies of the skin, eyes and upper and lower respiratory airways.

There are also ENT symptoms, like nasal, pharyngeal and laryngeal manifestations, characterised as catarrh forms of inflammation at this level, which respond slowly or remain rebellious to treatment (Ungureanu M., Ursu C., Podoleanu L., 2005). Thus, in the objective clinical examination, the results of anterior rhinoscopy show sometimes pale or slightly purplish congested nasal mucosa, covered in variable amounts of mucous secretion, which rarely are muco-purulent.

Because of the clinical appearance it may easily be mistaken for allergic rhinitis or vasomotor rhinitis which are clinically

¹ „Gheorghe Asachi” Technical University of Iași, Romania

² “Apollonia” University, Iași

characterized by three symptoms- nasal congestion with anosmia, aqueous rhinorrhea, and sneezing, and serologically they are characterised by positive allergy tests in the first case, while in the second case allergy tests are negative.

Pharynx tests show a moderate degree of hyperaemia, possibly hypertrophy of lymphoid formations in the posterior wall of the oropharynx, the presence of increased quantities of mucous secretions and sometimes exaggerated pharyngeal reflex.

Differential diagnosis with chronic catarrhal pharyngitis is the more so difficult, as patients have almost identical complaints: dry or itchy throat, burning sensation, sensation of a migrating, irritating foreign body, which is not related to swallowing.

Patients who complain of temporary hoarseness of the voice, accompanied by dry cough, irritation, tingling of the larynx show at the laryngeal examination mild congestion of the vocal folds with unimpaired mobility or mild swelling in Reinke's space, manifestations and symptoms which are encountered in catarrhal chronic laryngitis as well.

Some inflammatory conditions with clinical aspects of bronchitis or asthma attacks can be found in lower airways of the larynx.

Giardiasis can be diagnosed by identifying cysts in coprologic tests prepared with Lugol solution (70% of the tests are efficient), identifying vegetative forms in bile sediments obtained by duodenal tubage or immunofluorescence tests, ELISA, which achieve 90% efficiency. More modern and safer is to determine the presence of the *Giardia* antigen in stool.

MATERIAL AND METHOD

The retrospective study has been conducted on a group of 2015 patients and has been structured on gender and age groups, as shown in *table 1*. In order to detect *Giardia* cysts, stool samples have been examined by using Lugol solution, which makes the cysts to appear brown in colour. The Lugol solution shows internal structure details that can fall into three categories:

- large cysts (12 μm), light brown, obvious double contour, flagella clusters and nuclei are difficult to distinguish, these are well hydrated, recently formed cysts;
- medium cysts (10 μm), dark brown, double contour is more difficult to distinguish, these cysts are more dehydrated than the first ones; interior anatomy of the cyst is clearer;
- small cysts (less than 10 μm), double contour cannot be seen, the content is

homogeneous, no details; these are not viable cysts.

The results of the examination with regard to the degree of infestation have been recorded as follows:

- reduced infestation: 2-5 cysts/field;
- medium infestation: 6-20 cysts/field;
- massive infestation: over 20 cysts/field.

RESULTS AND DISCUSSION

Depending on the degree of infestation within the group of patients, we have obtained a distribution by gender in *table 2* and by age in *fig. 1*.

The study we have conducted has shown a total number of 499 negative results, representing 24.76% of all those investigated. The absence of Giardiasis in these cases has been determined after four scatology tests have been carried out within a period of approximately 21 days and they were all negative. We proceeded in this manner because Giardiasis tests may be negative because of the phenomenon of trophozoite insularism, which is discontinuous. During this phenomenon the cysts are eliminated in the stool. When it stops, coprologic tests are negative for 7-10 days, but this period can extend up to 30 days. The largest number of positive results has been recorded in the age group 41-60 years, 806 cases, i.e. 53.19%. Within the same age group there have been registered 492 cases of medium infestation (a majority of 78,1%). These results can be explained through the fact that 540 subjects (67%) had a dog. In dogs, Giardiasis is likely to occur at any age, race and gender and it is transmissible to humans. It is transmitted via fecal-oral route (fur licking, coprophagia, puddle water drinking) with possible re-infection and self-infection (Chandler E.A., 1994). Some dogs, as they age, develop adaptive immunity, which can be temporarily lowered due to immunological disorders with immunosuppression (stress, corticosteroids) (Coman P., Podoleanu L., Gașpar C., 2003). The organism cannot be sterilized irrespective of the drug (so that, invariably, some dogs which have been treated, remain carriers), and decontamination of surfaces (e.g. gardens) is impossible to be fully performed, veterinarians recommend repeating treatments periodically. For dog owners it is necessary to respect a series of measures that limit re-infection: disinfecting floors and feeding bowls, monitoring access to contaminated or unknown water sources, deterring coprophagia, undergoing coprologic tests and prophylactic treatment of newly purchased animals.

Giardia is transmitted directly from the sick to the healthy person and via dirty hands,

contaminated objects, water, etc. Therefore, some rules are necessary:

- it is essential to wash the hands and it should be mandatory especially for children, each time they eat, each time they play with animals, after they use the toilet;
- wash every fruit and vegetable thoroughly before eating it;
- avoid using water from wells, especially in the countryside, when preparing milk for the

children if the source is not microbiologically verified;

- pay attention to pets (including dogs, cats, fish) that may be *Giardia* carriers;
- if adults are carriers of *Giardia* in the house they should be treated, even if they do not have symptoms, because they can transmit the parasites to children. It is mandatory to treat the entire family, not only the child, even though the adults do not present symptoms.

Table 1

Structure of the sample according to gender and age

Gender	Age group	children	18-20	21-40	41-60	>61	TOTAL
		Female	18	136	227	363	163
Male		23	166	276	443	200	1108
TOTAL		41	302	503	806	363	2015

Table 2

Structure of the sample according to gender and degree of infestation

Gender	Degree of infestation	negative	reduced	medium	massive	TOTAL
		Female	225	125	443	114
Male		274	153	541	140	1108
TOTAL		499	278	984	254	2015

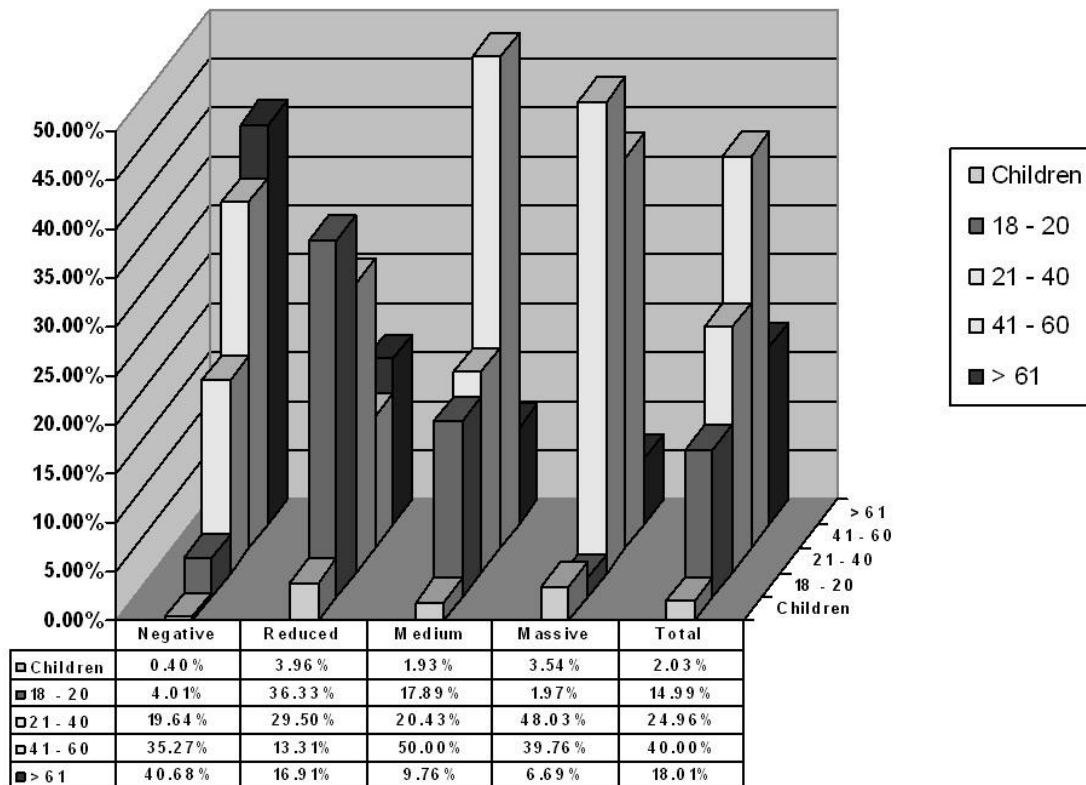


Figure 1 Structure of the sample according to the degree of infestation and age group

CONCLUSIONS

1. *Giardia* is a very common parasite, present worldwide; its clinical presentation is unspecific, it creates confusion and it requires the identification of the etiological agent, in order to establish a diagnosis and the necessary treatment.
2. The dog is a source of infection and a main source of water and environment pollution requires the implementation of preventive measures.
3. Negative tests do not rule out this infection and it is necessary to carry out multiple coprologic examinations because they are decisive when establishing the treatment.

REFERENCES

- Bolin, T.D., Davis, A.E., Duncombe, V.M., 1982** – *A prospective study of persistent diarrhoea*, Aust N.Z. J. Med., Vol. 12, No. 1, pag. 22-6.
- Chandler, E.A., 1994** – *Canine Medicine and Therapeutics*, Blackwell Scientific Publications, Oxford.
- Chirilă, M., Panaitescu, D., Capraru, T., 1981** – *Frequency of Giardia lamblia in certain allergic syndromes*. Med. Interne. Vol. 19, No. 4, pag. 367-372.
- Clyne, C.A., Eliopoulos, G.M., 1989** – *Fever and urticaria in acute giardiasis*. Arch. Intern. Med. Vol.149, No.4, pag. 939-940.
- Coman, P., Podoleanu, L., Gașpar, C., 2003** – *Etologie și etopatologie*, Ed. Tehnopress, Iași.
- Corsi, A., Nucci, C., Knafelz, D., Bulgarini, D., Di Iorio, L., Polito, A., De Risi, F., Ardenti Morini, F., Paone, F.M., 1998** – *Ocular changes associated with Giardia lamblia infection in children*. Br. J. Ophthalmol., Vol. 82, No. 1, pag. 59-62.
- Gherman, I. 1993** – *Compendiu de parazitologie clinică*, Ed. ALL, București.
- Grițescu-Mică, A., 1982** – *Mică enciclopedie de zoonoze*, Ed. Didactică și Pedagogică, București.
- Gunasekaran, T.S., Hassall, E., 1992** – *Giardiasis mimicking inflammatory bowel disease*, J. Pediatr., Vol.120, No.3, pag. 424-426.
- Hill, D.R., Nash, TE., 2009** – *Giardia lamblia*. In: Mandell, G.L., Bennett, J.E., Dolin, R, eds. *Principles and Practice of Infectious Diseases*. 7th ed., chap 280, Elsevier Churchill Livingstone Philadelphia, Pa.
- Huston, C.D., 2006** – *Intestinal protozoa*. In: Feldman, M., Friedman, L.S., Sleisenger, M.H., eds. *Sleisenger & Fordtran's Gastrointestinal and Liver Disease*, 8th ed., chap 106, Saunders Elsevier, Philadelphia, Pa.
- LeBlanc, C.M., Birdi, N., 1999** – *Giardia lamblia associated arthritis in a 19-month-old child*. J. Rheumatol. Vol.26, No.9, pag. 2066-2067.
- Letts, M., Davidson, D., Lalonde, F., 1998** – *Synovitis secondary to giardiasis in children*. Am. J. Orthop., Vol. 27, No 6, pag. 451-454.
- Pettoello Mantovani, M., Giardino, I., Magli, A., di Martino, L., Guandalini, S., 1990** – *Intestinal giardiasis associated with ophthalmologic changes*. J. Pediatr. Gastroenterol. Nutr. Vol. 11, No.2, pag.196-200.
- Spaulding, H.S. Jr., 1990** – *Pruritus without urticaria in acute giardiasis*. Ann. Allergy., Vol. 65, No. 2, pag.161.
- Ungureanu, M., Ursu, C., Podoleanu, L., 2005** – *Manifestări O.R.L. în giardioză*, Rev. Medicină Militară, Vol. CVIII, No. 1, pag. 7-10.