

CONTRIBUTIONS TO THE KNOWLEDGE OF *GIARDIA INTESTINALIS* PARASITE IN THE ARGES POPULATION

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Abstract

The present study, conducted in January-December 2007-2010 to the Argeș population revealed a high incidence of parasitization with *Giardia intestinalis* to the preschool children: 38.9%. There are not significant differences related to gender distribution of parasitization with *G. intestinalis*, and most cases come from urban areas. This study seeks to highlight the socio-medical importance of this pathology to Arges population, because infestation with *Giardia intestinalis* is the most common cause of acute and chronic diarrhea in children and in adults, too.

Key words: *Giardia intestinalis*, incidence of parasitization, age group, Arges County

1. INTRODUCTION

Giardia intestinalis is one of the most widespread intestinal parasites in the world. People are considered to be the most important reservoir hosts for human giardiasis. Estimates vary, but fully 20 percent of the world's population have giardiasis, and the incidence of parasitization among children world-wide has been found to range from 1% to 36% and occasionally may be as high as 72% depending on the age group and country (<http://water.epa.gov>). Bartlett et al. (1991) found that 11% of infants and toddlers tested for admission to day care centers in Arizona were already infested. Gray and Rouse (1992) found that 23.7% of index cases of giardiasis in Bristol, England, were in preschool children. This parasite was identified in 72% of the fecal specimens examined from 92 institutionalized Romanian children (Brannan et al, 1996).

Giardia affects many animals as well. Currently, the scientific literature distinguishes morphologically between different species of *Giardia*: *G. intestinalis* in mammals, *G. agilis* in amphibians, *G. varani* in reptiles, *G. ardeae* and *G. psittaci* in birds, *G. muris* in rodents, and *G. microti* in muskrats and voles. Other species of *Giardia* probably also exist in animals, including fish. None of these species, other than *G. intestinalis*, is known to affect people. Sulaiman et al. (2003) confirm that *G. intestinalis* from certain animals can potentially infest humans. Recently, Franzen et al (2009) suggests that the two major *Giardia* genotypes, assemblages A and B, who infest humans can be two different species. Jerlström-Hultqvist et al. (2010) strengthen this data.

In our country, the incidence of giardiasis is on average 12.54% (Rădulescu, 2000). Contaminated water is the classical source of a *Giardia* infection. Deficient hygiene is another cause of giardiasis, its incidence being very high in congested cities.

2. MATERIAL AND METHODS

The studies conducted in January - December 2007 - 2010 when were collected faecal samples from a total of 9538 patients in the Arges County (7112 patients in 2007, 1086 patients in 2008, 603 patients in 2009 and 737 patients in 2010). The samples were processed in the Laboratory of Parasitology of the Medical Center Mipet Meditest Pitesti. Sampling was performed due to suspicion of infection, and in 2007 was a national mobilization to carry out medical tests.

According to the protocol, each patient was taken three samples, one sample being insufficient in terms of the flashing elimination of parasites. Principle of the method consisted in direct examination, macroscopic and microscopic, of small fragments by faecal material in Lugol solution or physiological saline.

In the present study were followed aspects of parasitization according to the age group, gender and provenance group (rural/urban). There were established following age groups: preschool children (2-6 years), school children (7-14 years), high school students (15-18 years) young people (19-35 years), adults (36-59 years), and old people (over 60 years).

It avoids a global estimate of the incidence of giardiasis in Arges population, whereas the sampling does not allow an objective assessment of this parasitosis.

3. RESULTS AND DISCUSSIONS

a. The aspect of infestation with *G. intestinalis* depending on the age group

According to the literature, the prevalence varies with age, being higher in young ages; highest prevalence is found between 1-6 years, then decreases and remains at a constant level in adults (Rădulescu, 2000).

A comparative analysis of parasitizing on age groups during the four years of study, it is found that the incidence of giardiasis is highest in the 2-6 years age group, the average being 38.9% (Table 1, Fig.1). It is a higher rate than that found by Gray and Rouse (1992) in Bristol, England. Follow the 7-14 years age group with a 20.9% incidence.

Table 1. Infestation with *Giardia intestinalis* depending on the age group, Arges, 2007 – 2010

Year	Age group												Total
	2 – 6 years preschool children		7 – 14 years school children		15 – 18 years		19 – 35 years		36 – 59 years		over 60 years		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
2007	2161	42.4	1035	20.3	414	8.1	390	7.6	305	6	794	15.6	5099
2008	203	29.8	193	28.3	96	14	66	9.7	50	7.3	74	10.9	682
2009	100	24.6	98	24.1	56	13.8	51	12.6	50	12.3	51	12.6	406
2010	179	29.5	100	16.5	56	9.2	64	10.5	108	17.8	100	16.5	607
Total	2643	38.9	1426	20.9	622	9.2	571	8.4	513	7.6	1019	15	6794

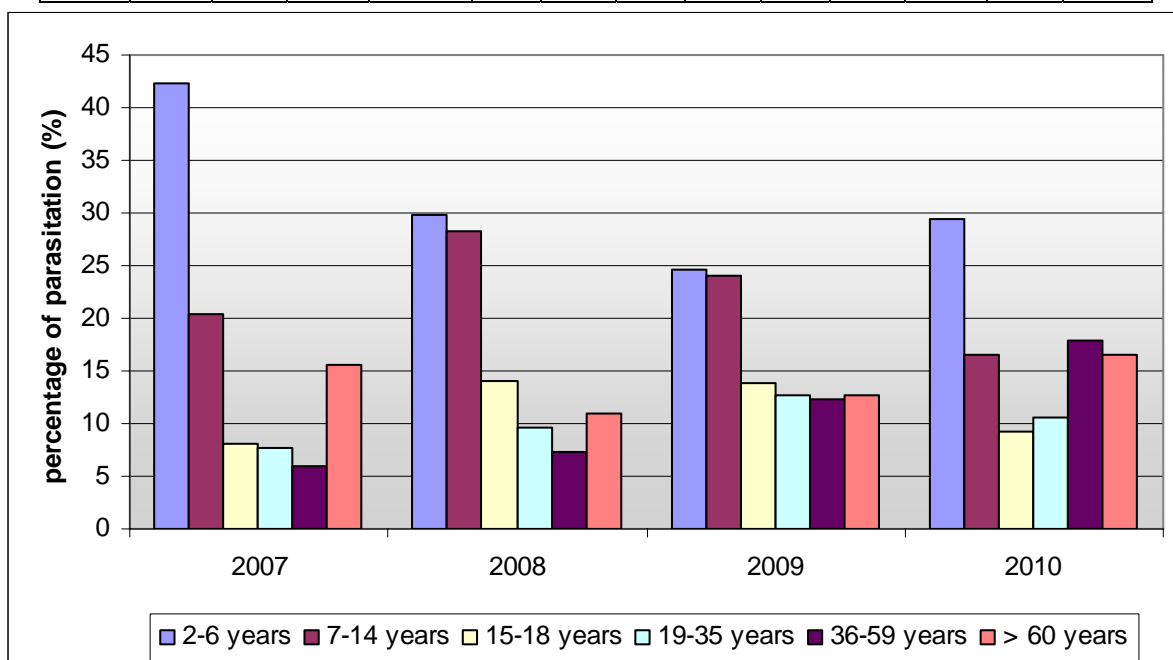


Figure 1. Incidence of infestation with *Giardia intestinalis* depending on the age group in Arges

This situation is due to poor hygiene in preschool and school children. In the elderly group, weakened immune system makes them more vulnerable, so it finds an average percentage of 15%. In other age groups the incidence varies from 7.6 to 9.2%.

b. The aspect of infestation with *G. intestinalis* depending on the gender group

Comparative values of parasitization on the gender group revealed higher values in males, with a peak in 2010: 62.3%. (Table 2, Fig. 2). However, more relevant are data from 2007, when samples were processed from a larger number of patients. These show a more balanced parasitization: 46% for females and 54% for male.

Table 2. Infestation with *Giardia intestinalis* depending on the gender group, Argeş, 2007 – 2010

Year	♀♀		♂♂		Total
	No.	%	No.	%	
2007	2350	46	2749	54	5099
2008	284	41.60	398	58.40	682
2009	169	41.60	237	58.40	406
2010	229	37.70	378	62.30	607
Total	3032	44.62	3762	55.37	6794

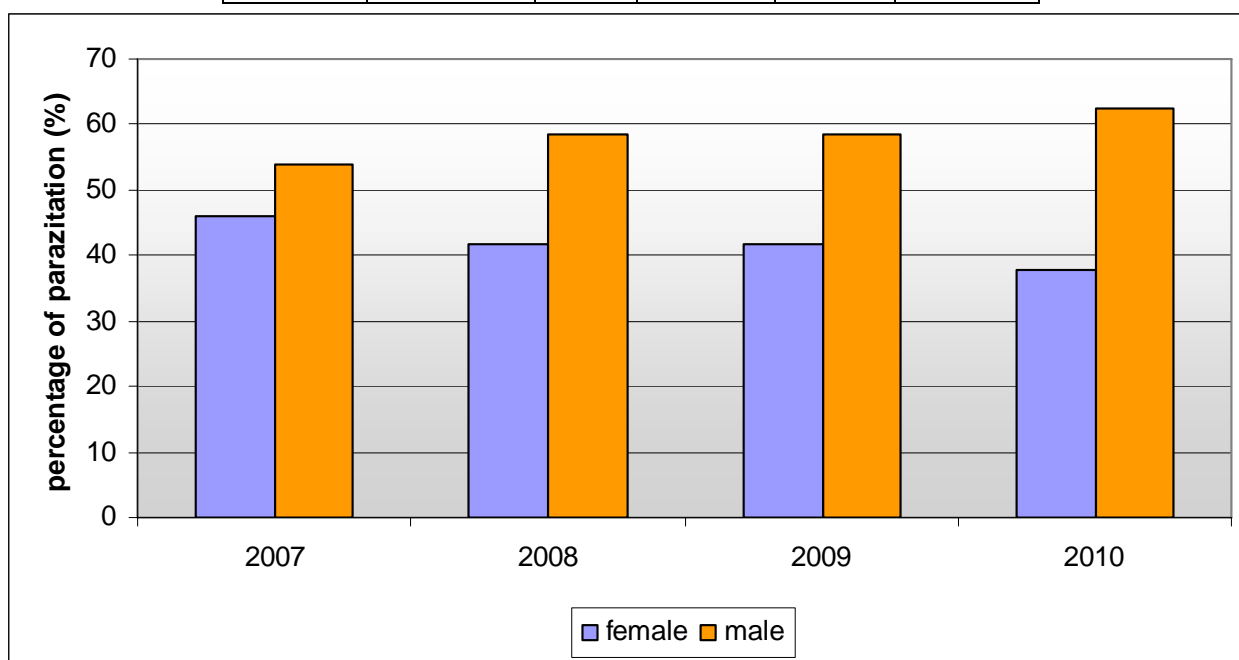


Figure 2. Incidence of infestation with *Giardia intestinalis* depending on the gender group in Argeş

c. The aspect of infestation with *G. intestinalis* depending on the provenance group (rural / urban)

According to the literature (Rădulescu, 2000), the prevalence is higher in urban areas, suggesting that the high population density favors infestation. The comparison between the situation of infestation in the four years investigated, shows a large difference between the number of cases in urban areas compared to the rural areas (Table 3, Fig. 3). Thus, in 2007, of the 5099 patients infested, 75.9% come from urban areas. In the following years, although the total number of investigated patients is much lower, patients in urban areas have the highest values of parasitizing, too.

Overcrowding and low immunity generated by pollution factors, improper nutrition, and infested water are factors that favored the infestations with *G. intestinalis* in urban areas. To this situation, is added absence of medical checks in rural areas. Overall, parasitization rate is 78.7%.

Table 3. Infestation with *Giardia intestinalis* depending on the provenance group, Argeş, 2007 – 2010

Year	The provenance group		Total
	Rural	Urban	
2007			5099
2008			682
2009			406
2010			607
Total			6794

	No.	%	No.	%	
2007	1229	24.10	3870	75.90	5099
2008	280	41.10	402	58.90	682
2009	90	22.20	316	77.80	406
2010	235	38.70	372	61.30	607
Total	1834	21.3	6794	78.7	8628

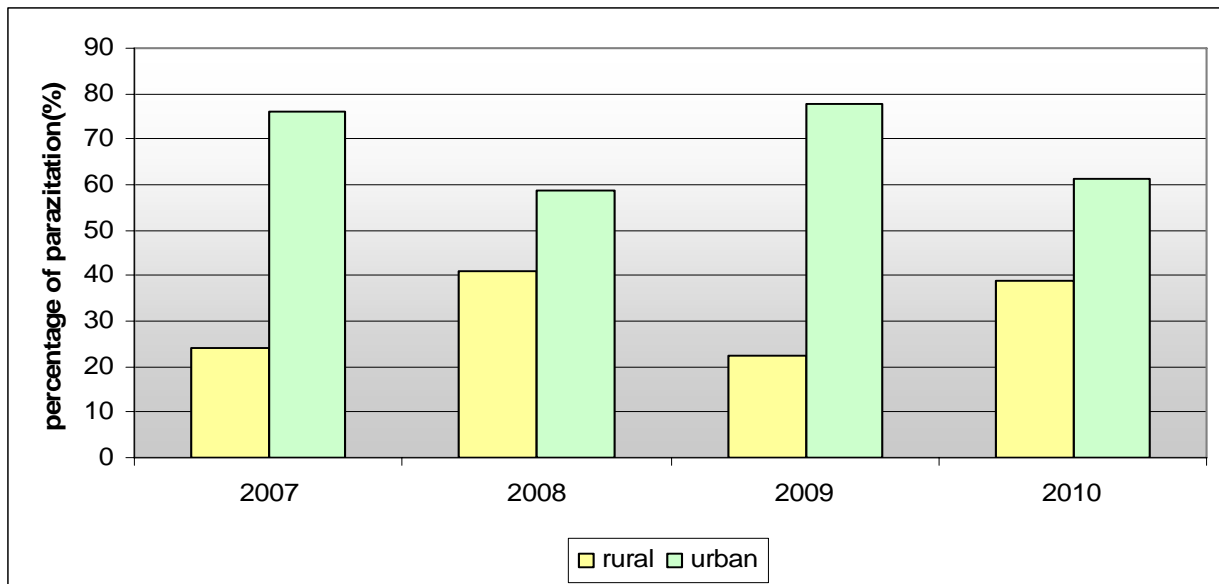


Figure 3. Incidence of infestation with *Giardia intestinalis* depending on the provenance group (rural/urban) in Argeş

4. CONCLUSIONS

The study conducted in January-December 2007-2010 on 9538 patients from Argeş County revealed a high incidence of parasitization with *Giardia intestinalis* to the preschool children: 38.9%.

There are not significant differences related to gender distribution.

The most cases come from urban areas, due to overcrowding and low immunity of cities inhabitants compared with those from rural area, to which is added the absence of health education and medical checks in rural areas.

5. ACKNOWLEDGEMENTS

We address our thanks to the staff of Medical Center Mipet Meditest Pitesti for their help.

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