

Case report

A case of a child with four parasites in Bulgaria

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ABSTRACT. Children are more susceptible to intestinal parasitic diseases than adults due to their lack of hygiene habits and close social interactions with their peers. We present a case of a 5-year-old boy with diarrhea and abdominal pain. The stool sample and perianal swab were examined in LINA laboratory, Burgas, Bulgaria. We detected four parasites *Giardia (Lambliia) intestinalis*, *Blastocystis hominis*, *Hymenolepis nana* and *Entamoeba coli*. Microbiological stool examination shows negative results for *Candida* spp., *Salmonella* spp. and *Shigella* spp. Patient's peripheral blood tests were normal. The calprotectin in faeces was tested establishing slightly increased values. The presence of four parasites in one patient in Bulgaria (in the 21st century) is a rare case. Lambliosis and hymenolepiosis are more likely to be found in this patient's region. Following the presence of *Entamoeba coli* and the transmission mechanism of the other three parasites it can be concluded that the child's hygiene is poor. This patient reveals typical clinical picture with mild symptoms and normal paraclinical results. The presence of parasites in a definitive host is not necessarily related with the development of pathological departures. The fight with parasitic diseases can be successful with a broad integral approach – recognizing and diagnosing the parasites promptly and using radical and suitable treatment.

Keywords: *Giardia intestinalis*, *Blastocystis hominis*, *Hymenolepis nana*, *Entamoeba coli*, coinfection, child

Introduction

Children are more susceptible to intestinal parasitic diseases than adults due to their poor hygiene and close social interactions with their peers. The etiological structure was dominated by *Enterobius vermicularis* and *Giardia intestinalis*, but in practice other parasites were diagnosed. Giardiasis (lambliosis) is one of the leading diseases in Bulgaria with incidence of 15 (per 100 000) (prevalence 0.26%) in 2018. Cases of 565 children were reported from total amount of 139 999. Leading Bulgarian cities were Sofia (253) and Burgas (187) [1]. Giardiasis is an intestinal parasitosis which can be asymptomatic or cause diverse clinical symptoms – diarrhea, abdominal pain, discomfort and allergy. Blastocystosis (prevalence 0.37% in Bulgaria) is another parasitic disease that affects both children and adults [1]. It is a protozoan parasitosis which can be asymptomatic

or manifest with diarrhea. Hymenolepiosis is a helminthiasis that is not diagnosed as often and causes allergic, neurovegetative and gastrointestinal symptoms [2]. The incidence in Bulgaria during 2018 is 1.8 (per 100 000) (prevalence 0.04%) [1]. The biggest amount of cases were registered in cities Sliven and Yambol. *Entamoeba coli* is a non-pathogenic parasite the presence of which suggests consumption of polluted water and food [3]. The clinical manifestations depending etiological agent depend on the host's reactivity, intensinvasion and other conditions (biological, ecological).

Parasitological examination is important for the diagnosis. The calprotectin test is also indicative. Calprotectin is a protein released by a type of white blood cell called a neutrophil. When there is inflammation in the gastrointestinal tract, neutrophils move to the area and release calprotectin, resulting in an increased level in the stool. This test measures the level of calprotectin in stool as a way to detect

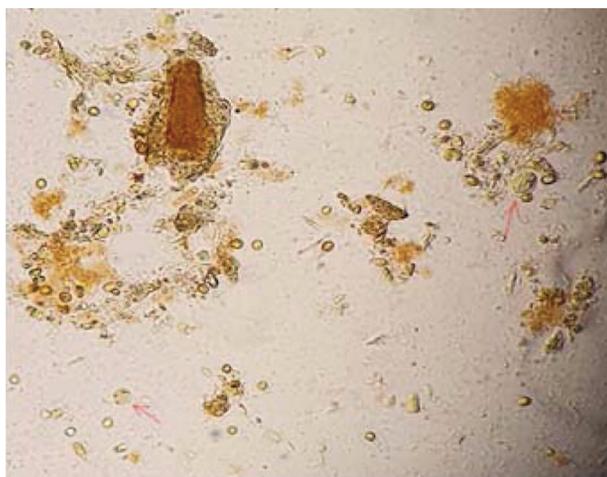


Figure 1. *Giardia (Lamblia) intestinalis* (stained with Lugol's iodine solution) – cyst form (the arrow at the top right) and *Blastocystis hominis* – vacuolar form (down left arrow)

inflammation in the intestines.

Case presentation

A case of a 5-year-old child from city Straldzha (south-east Bulgaria) was presented. Due to gastrointestinal symptoms such as diarrhea (once-twice a day) and abdominal pain without fever, the patient was sent for parasitology testing. The stool sample and perianal swab were examined in LINA laboratory, Burgas, Bulgaria. Cysts of *Giardia (Lamblia) intestinalis*, vacuolar forms of *Blastocystis hominis* and cysts of *Entamoeba coli* were isolated from the faeces colored with Lugol's iodine solution

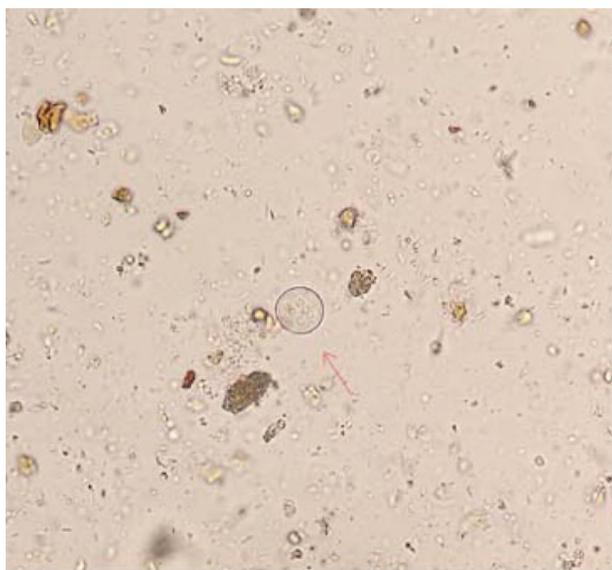


Figure 2. *Entamoeba coli* (stained with Lugol's iodine solution) – cyst form (the arrow in the center)

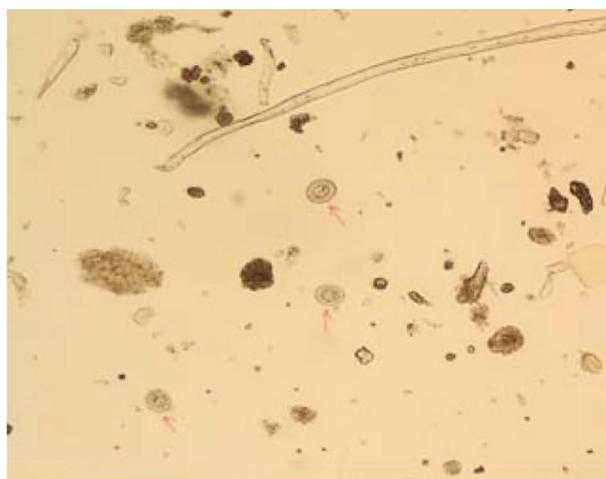


Figure 3. *Hymenolepis nana* (stained with Lugol's iodine solution) – eggs (the arrows at the bottom left and in the center)

(Figs 1,2) Eggs of *Hymenolepis nana* were found after applying enrichment method (a sedimentation in conic glasses) (Fig. 3) Patient's peripheral blood tests were normal: HGB – 124 g/l (range 120–180), RBC – $4.9 \cdot 10^{12}/l$ (range 3.70–5.90), HCT – 0.38 l/l (range 0.360–0.530), WBC – $5.9 \cdot 10^9/l$ (range 1.2–6.8), MCHC – 328 g/l (range 300–360), MCH – 25 pg (range 25–33), MCV – 76.3 fl (range 70–96), PLT – 116% (range 100–500). Microbiological stool examination shows negative results for *Candida* spp., *Salmonella* spp. and *Shigella* spp. The calprotectin in faeces was tested establishing slightly increased values – 60.6 ug/g (+) (range: <50ug/g (-), 50–200ug/g slightly increased, >200ug/g highly increased).

Discussion

The presence of four parasites in one patient in Bulgaria (in the 21st century) is a rare case. Lambliosis and hymenolepiosis are more likely to be found in this patient's region [1]. Following the presence of *Entamoeba coli* and the transmission mechanism of the other three parasites it can be concluded that the child's hygiene is poor. This patient reveals typical clinical picture with mild symptoms and normal paraclinical results. The presence of parasites in a definitive host is not necessarily related with the development of pathological departures [4]. The clinical manifestations in parasitic diseases depend on the host's reactivity, intensity of invasion and other conditions. Professional literature shows reports of

asymptomatic cases caused by *Lamblia intestinalis*, as well as development of ulcerous colitis [5]. Furthermore lambliosis and blastocystosis cause inflammation in the intestinal mucosa with different severity. The inflammatory process involves macrophages, CD4, CD8, INF- γ etc [6,7]. The pathogenic effect of *Hymenolepis nana* is mechano-traumatic, toxoallergic and enzymopathological [8]. The slightly increased values of calprotectin combined with the mild symptoms and normal paraclinical results might be caused by one of the isolated parasites. A literature review shows that *Lamblia intestinalis* might cause increased values of calprotectin in some patients. Apart from chronic ulcerative colitis and Crohn's disease calprotectin testing can be used for some intestinal parasitic diseases [9,10]. The fight with parasitic diseases can be successful with a broad integral approach – recognizing and diagnosing the parasites promptly and using radical and suitable treatment.

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