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Case Report

Hypoproteinaemia and Edema Due to Giardiasis

M. Baghaei*

Abstract
The present report describes a 5-years-old girl who presented with hypoproteinaemia and generalised oedema due to giardiasis. She recovered fully 2 weeks after treatment with oral metronidazole. The emphasis is on the importance of giardiasis in children with hypoproteinaemia of obscure aetiology.
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Introduction

Giardiasis due to *Giardia intestinalis* is one of the most common protozoan intestinal diseases worldwide. The parasite infests the human duodenum and generally results in asymptomatic intestinal colonisation; but in many cases it may cause chronic or acute diarrhea and malabsorption of fat; fat-soluble vitamins and disaccharids.[1,2] However, in giardiasis hypoproteinaemia and oedema are very rarely reported.[3,4] The present report describes a young child with generalised oedema and hypoproteinaemia due to giardiasis.

Case Presentation

A 5-year-old girl who lives in London with her parents was admitted to the Great Ormond University Hospital, London with swelling of the legs, face and abdominal distension which had been present for 4 days. She also had a 5-weeks history of abdominal discomfort and passing loose stools. Her relatives live in Shiraz, Iran where giardiasis is endemic and the girl had visited them 4 months prior to admission.
Physical examination revealed a pale, irritable child with generalised oedema and abdominal distension. She was 110 cm tall and weighed 15 kg. Respiratory and cardio-vascular examination proved normal. There was no ascites but her abdomen was distended and her spleen and liver were not palpable. Laboratory testes yielded the following results; A WBC count of 9800/ml, RBC distribution with 25%, 0.9% reticulocytes, haemoglobin level of 9.5 gr/dl, MCV 54 fl and a platelet count of 456000/ml. Hypochromia and microcytosis was observed in peripheral blood smear. The serum iron level was 35ug/dl(normal 45-140), TIBC 390 ug/dl(normal 20-350), serum ferritin 15 ug/dl (normal 20-300) and 10% transferrin saturation. The total serum protein and albumin level were 4.5 g/dl(normal 6-8) and 2.5 g/dl(normal 3.5-5) respectively. The prothrombin, activated partial thromboplastin times, serum transaminases, bilirubin, electro-

Department of Parasitology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Correspondence: M. Baghaei, M. D, Department of Parasitology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
Tel: +98-311- 7922481
Fax: +98-311-6681650
E-mail: mehdibaghaei@yahoo.com

lytes, glucose, blood urea nitrogen, creatinine level, urinalysis and 24–hours urinary protein excretions were all normal. Tests for serum immunoglobulin A, anti-endomysial anti body, IgA and IgG anti-gliadin antibody were all negative. Sweat chloride concentration and serum IgA, IgG, IgM levels were normal.

Alpha-1-antitrypsin clearance was calculated from a 24-hour stool collection and found to be markedly elevated at 375 ml/24 (normal<30). Direct stool examination showed large numbers of *G. intestinalis* trophozoites.

Based on the clinical and laboratory findings, intestinal protein loss was obvious, caused either by giardiasis or gluten-sensitive enteropathy. She was treated with metronidazole for 10 days and kept on her regular diet. The generalised oedma began to disappear after 3 days of therapy and totally disappeared after 14 days. Serum total protein measured 5.8 g/dl (normal 6-8) and albumin 4.2 g/dl (normal 3.5-5). She was prescribed an 8- week course of 4 mg/kg oral iron at post –treatment examination because of iron deficiency anemia. Physical examination on completion of iron therapy was normal, as were serum immunoglobulin, total protein, albumin and hemoglobin levels.

Repeat testing also proved negative for anti-gliadin and anti-endomysium antibodies. The stool alpha-1- antitrypsin test was normal at the end of treatment period. Giardia cysts or trophozoites were not observed in the stool and the girl remained symptom free while on her regular diet during 4 months of follow-up.

Discussion

Although giardiasis has been suspected to be a potential cause of protein-losing enteropathy in children [5,3, 4], this is the first case proved by laboratory findings. The patient presented with hypoproteinaemia, oedma and anemia. Her normal liver function, urinalysis and normal dietary protein intake were suggestive of protein loss via the gastro-intestinal tract and this was proven by stool alpha-1-antitrypsin test; a test that would definitively show gastro-intestinal protein loss.[6] Gluten sensitive enteropathy was suspected since it is one of the leading causes of protein-losing enteropathy in children, but the patient tested negative for anti-gliadin, anti-endomysial antibodies and steatocrit. Other diseases causing intestinal protein loss such as congenital intestinal lymphangiectasia, cystic fibrosis and Crohn's disease were excluded by clinical laboratory findings. The initial stool examination showed a large number of *G. intestinalis* trophozoites. The patient was treated with metronidazole alone and the rapid resolution of symptoms in response to metronidazole indicated that giardiasis was the cause of the generalised oedema and hypoproteinaemia as in two other previously reported cases.[5,3] Light microscopic studies of intestinal mucosa have shown that trophozoites of *G. intestinalis* attach to epithelial cells and mucous filaments in the intervillous space. This mechanically blocks and inflames the mucosa and may lead to protein malabsorption and loss of protein.[2] Giardiasis can be associated with low hemoglobin levels and antiparasitic treatment might improve iron levels in such cases.[7] However, in the present case the oral iron therapy was necessary as the patient continued to have low hemoglobin levels after a course of metronidazole therapy. Impaired iron absorption and blood loss from the intestine are the possible underlying mechanisms of anemia in giardiasis.[1,7] The high prevalence of *Giardia* infection in children in developing countries makes giardiasis an important health problem and the present report suggest that it is important to keep giardiasis in mind as a possible cause of hypoproteinaemia due to the protein-losing enteropathy.

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References

1 Burke AJ: Giardiasis in childhood. *Am J Dis Child 1975;***129:**1304-10.

2 Farthing MJ, Mata L, Urrutia JJ, Kronmal RA: Natural history of giardia infection of infants and children in rural guatemala and its impact on physical growth. *Am J Clin Nutr 1986;***43(3):**395 – 405.

3 Ozcay F, Harmanci K, Ozbek N: Giardiasis as the cause of oedema and hypoproteinaemia in a child. *Ann Trop Paediatr 2002;***22(1):**63-5.

4 Sherman P, Liebman WM: Apparent protein-losing enteropathy associated with giardiasis. *Am J Dis Child 1980;***134(9):**893-4.

5 Korman SH, Bar-Oz B, mandelberg A, matoth I: Giardiasis with protein–losing enteropathy: diagnosis by fecal alpha 1-antitrypsin determination. *J Pediatr Gastroenterol Nutr 1990;***10(2):**249-52.

6 Zein CO, Nehra V: 40 year-old man with anemia and hypoalbuminemia. *Mayo Clin Proc 2001;***76(11):**1163-6.

7 Jimenez JC, Rodriguez N, Di prisco Mc, et al: Haemoglobin concentrations and infection by giardia intestinalis in children: effect of treatment with secnidazole. *Ann Trop Med Parasitol 1999;***93(8):**823 –7.