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□ Case Report □

Strongyloidiasis associated with amebiasis and giardiaisis in an immunocompetent boy presented with acute abdomen

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Abstract: *Strongyloides stercoralis* (SS) is an intestinal nematode that is mainly endemic in tropical and subtropical regions and sporadic in temperate zones. SS infection frequently occurs in people who have hematologic malignancies, HIV infection and in individuals undergoing immunosuppressive therapy. In this study, we report a 12-year-old immunocompetent boy who was admitted to our hospital with acute abdomen. Laboratory evaluation showed strongyloidiasis, amebiasis and giardiasis. Clinical and laboratory findings immediately improved with albendazole therapy. Therefore, when diarrhea with signs of acute abdomen is observed, stool examinations should be done for enteroparasitosis. This approach will prevent misdiagnosis as acute abdomen. Complete clinical improvement is possible by medical therapy without surgical intervention.

Key words: strongyloidiasis, amebiasis, giardiasis, acute abdomen, child

INTRODUCTION

Enteroparasites are widely distributed around the world, and infection usually-varies according to region and age. An increase in the incidence of these infections is evident in closed, low socio-economic communities, with poor sanitation. *Strongyloides stercoralis* (SS) is an intestinal nematode that is endemic in tropical and subtropical regions and sporadic in temperate zones (Burke, 1978; Bannon et al., 1995; Karolyi et al., 1999).

SS infection frequently occurs in people who have hematologic malignancies, HIV infection and in individuals undergoing immunosuppressive therapy (Lee SK et al., 1994; Nucci et al., 1995; Woodring et al., 1996; Graeff-Teixeira et al., 1997). There are some reports demonstrating a combination of strongyloidiasis and other parasitosis (Nadler et al., 1990; Hökelek et al., 1998). Here, we report a 12-year-old boy with strongyloidiasis, amebiasis and giardiasis, who was immunocompetent and had symptoms of acute abdomen.

CASE RECORD

A 12-year-old boy was referred to our hospital because of abdominal pain and diarrhea for a period of two days in October 2001. He complained of crampy, severe, upper abdominal pain, anorexia, vomiting and diarrhea. His stools were yellow, watery, and foul smelling and numbered 10 to 15 per day. He had lost 3 kgs in two days. He was

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hospitalized in the Pediatric Surgery Unit. On physical examination, he was pale and lethargic. His weight was 32 kg and his height was 143 cm, both between the 10th and 25th percentile for his age. He has markedly tender, distended abdomen with rebound tenderness and guarding. Abdominal X-rays showed air-fluid levels of small bowel and ultrasonographic examination of the abdomen revealed the same findings. According to the clinical and radiologic findings, besides leukocytosis, he was diagnosed as having acute abdomen and peritonitis. After that, *Entamoeba histolytica* cysts and trophozoites, *Giardia intestinalis* cysts, fungal hyphae, fatty granules and many leukocytes were seen on microscopic evaluation of stool, and he was transferred to the Pediatric Infectious Diseases Unit. Laboratory findings were as follows: hemoglobin 13 g/dL, MCV 86.6 fL, white blood cell count 29,700/mm^3 with 85% neutrophils, 5% band forms, 10% lymphocytes and positive toxic granulation, platelet count 475,000/mm^3, erythrocyte sedimentation rate 107 mm/h, serum C-reactive protein level 21.5 mg/dL. Serum levels of immunoglobulin G (IgG), immunoglobulin A (IgA), immunoglobulin M (IgM), immunoglobulin E (IgE), IgG subgroups and T-lymphocyte subclasses were normal. We detected Giardia antigen in his stool by both indirect immunofluorescence antibody test (IFAT-Medac Diagnostica Test) and the EIA (Celisa) technique. The ameba antigen was positive in the serum sample by the latex test (Bicrolatex amibe), and in stool by EIA (Cellabs amibe). On the second day, native and lugol-stained portions of an unconcentrated stool specimen fixed with formalin, showed rhabditiform larvae of SS. The rhabditiform larvae were 320 μm in length and could be identified by their typical hourglass-shaped esophageal structure with a club-shaped anterior portion, a postmedian constriction, and a posterior bulbus, and short buccal capsule, prominent genital primordium. He was treated with albendazole, 400 mg/kg for three days and metronidazole 50 mg/kg/day for 14 days. Frequency of stool decreased immediately after albendazole therapy. Larvae of the SS disappeared on stool examination on the second day of treatment. Abdominal pain and diarrhea was completely resolved on the 3rd day, and he began to gain weight. He was discharged on the 14th day of admission.

One month later, he was readmitted to our hospital with the same clinical findings. Microscopic evaluation of the stool revealed SS larvae and *Entamoeba histolytica* trophozoites again, and a combination therapy of metronidazole and albendazole was given. He was free of discomfort by the third day and was discharged on the 10th day of admission. He has been asymptomatic for 20 months now, with negative stool examinations and weight gain.

DISCUSSION

Many individuals infected with SS are asymptomatic (Burke, 1978). Strongyloidiasis can occur in situations causing immunocompromisation, such as hematologic malignancies, usage of corticosteroids or other immunosuppressive therapies, HIV infection and malnutrition (Burke, 1978; Lee SK et al., 1994; Daubenton et al., 1998). If an immunocompromised individual is infected with SS, severe hyperinfection or disseminated disease with a high mortality rate could develop (Graeff-Teixeira et al., 1997).

Risk factors for SS infection include travelling to an endemic region and low socio-economic status with poor hygiene conditions (Bannon et al., 1995). However, there was no evidence for any underlying immunocompromising disease, poor hygienic condition or immunosuppressive therapy in our case. The immunologic status of our patient was also normal.

Symptoms of strongyloidiasis vary according to intestinal nematode migration. Cutaneous, pulmonary, gastrointestinal, disseminated forms or different combinations of these can be seen. Epigastric pain, vomiting, diarrhea and weight loss are prominent symptoms in many children (Burke, 1978). Cutaneous manifestations may be the only symptom of the disease. Intense itching, erythemateous papule,

petechiae and, larva migrans can develop at the site of the infection (Karolyi et al., 1999). Cough, wheezing, dyspnea, and hemoptysis develop as pulmonary complications during transpulmonary migration of the larvae. Adult respiratory distress syndrome can sometimes be seen (Graeff-Teixeira et al., 1997). Gastrointestinal signs and symptoms include abdominal pain, diarrhea, distended abdomen, steatorrhea, protein-losing enteropathy and malabsorption (Katz, 1999). Strongyloidiasis should be considered as a possibility in any child with unexplained eosinophilia, steatorrhea, protein-losing enteropathy or chronic diarrhea, especially if associated with weight loss, growth failure or recurrent upper abdominal pain (Burke, 1978). Symptoms and signs of amebiasis and giardiasis, such as abdominal pain, diarrhea, weight loss, and skin lesions, are similar to strongyloidiasis. Our patient suffered from diarrhea and abdominal pain. On physical examination, he had abdominal defense and rebound tenderness. We consider that all of the parasites that were determined in our patient contributed to the clinical picture of the patient.

Microscopic examination of the stool is a sensitive diagnostic method, but a negative result does not rule out SS infection. When SS is suspected, invasive or non-invasive diagnostic procedures should be performed. Direct microscopic identification is difficult but rhabditiform larvae of SS may be differentiated from the others with characteristic features. The rhabditiform larvae measuring 300-350 μm, has short buccal cavity, hourglass-shaped esophagus and prominent genital primordium in the mid-section of the larvae (Lee SK et al., 1994; Graeff-Teixeira et al., 1997; Katz, 1999). Investigation of SS in duodenal fluid obtained by esophagogastroduodenoscopy, culture or mucosal biopsy is an option (Bannon et al., 1995). Immunologic diagnosis can be made by IFAT detecting IgG and IgM antibodies or by ELISA detecting *Strongyloides* larvae antigens (Atkins et al., 1997). Agar culture is a sensitive tool for the proper diagnosis of chronic SS infection (Kobayashi et al., 1996). Since patients with SS infection may have protein-losing enteropathy and hypoalbuminemia, random fecal alpha-1 antitrypsin level measurements can be used as a diagnostic procedure (Sullivan et al., 1992). Eosinophilia has been demonstrated in 57% of the patients (Fisher et al., 1993). Our patient was diagnosed with strongyloidiasis after a microscopic examination of the patient's stool.

Nadler et al. (1990) reported a 65-year-old man with acute appendicitis who had strongyloidiasis and amebiasis. Hökelek et al. (1998) determined strongyloidiasis and amebiasis in a patient with ulcerative colitis. Bannon et al. (1995) and Rodrigues et al. (2001) reported SS infection with acute abdomen. Acute appendicitis and acute abdomen related with ruptured liver abscess were also reported due to amebiasis (Munoz et al, 1992; Ramdial et al 2002). Our patient had acute abdomen. Abdominal ultrasonography was normal. Clinical findings were completely resolved with antiparasitic therapy without surgical intervention. So that, although we couldn't find any article reporting giardiasis complicated with acute abdomen, we consider that besides strongyloidiasis, amebiasis and giardiasis may contribute to the development of symptoms and clinical signs of acute abdomen in our patient. To our knowledge, this is the first article reporting a case presenting acute abdomen due to a combination of strongyloidiasis, amebiasis and giardiasis.

Albendazole, thiabendazole, or ivermectin are recommended drugs for strongyloidiasis (Datry et al., 1994; Gann et al., 1994). With the treatment of albendazole and metronidazole, clinical and laboratory findings of our patient were improved. But, although he is immunocompetent and received sufficient antiparasitic therapy, a relapse of infection with SS and *E. histolytica*, occurred. Tsai et al. (2002) reported that the overall cure rate was 52% and overall mortality was 26% for strongyloidiasis. Although eradicating effect of albendazole was not sufficient and ivermectin is the most useful drug for the treatment of strongyloidiasis, we preferred albendazole because ivermectin is not available in Turkey (Zaha et al., 2000). After the second cure of the same therapy, the patient showed an excellent clinical response. Parasitic diseases like strongyloidiasis,

amebiasis, and giardiasis are related to sanitary factors and low socio-economic status. So that, we speculated that there might be a contamination source around the patient's environment.

In this study, we treated a 12-year-old immunocompetent boy with signs of acute abdomen, who had strongyloidiasis, amebiasis and giardiaisis. Therefore, when diarrhea with signs of acute abdomen is observed, stool examinations should be performed for enteroparasitosis. This approach will prevent misdiagnosis as acute abdomen and unnecessary surgical interventions. Complete clinical improvement is possible with medical therapy.

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