Eosinophilic ascites secondary to toxocariasis

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Abstract

Eosinophilic ascites is a very rare disorder. It can be a manifestation of the eosinophilic gastroenteritis in its serosal form or it can be secondary to infections, malignancies, vasculitis or hypereosinophilic syndrome. Among all infections, the ones produced by invasive helminth parasites should be initially suspected and ruled out. We report the case of a patient with eosinophilic ascites associated with diarrhea, abdominal pain and eosinophilia in peripheral blood. Eosinophilic colitis was also demonstrated in a colonic biopsy and empirical steroid treatment was started for suspected eosinophilic gastroenteritis. Later on, the patient improved ; the ascites disappeared and the eosinophil blood count returned to normal. Subsequently, serologic testing for toxocariasis was received positive and therefore, the diagnosis of eosinophilic gastroenteritis was discarded ; albendazole was also added to treatment. The patient remained asymptomatic on follow-up. We emphasize the need to rule out parasitic infections in all patients with gastrointestinal symptoms, eosinophilia and eosinophilic infiltration of gastrointestinal tissues. (Acta gastroenterol. belg., **2015**, 78, **332-335**).

Key words : eosinophilic ascites, eosinophilic gastroenteritis, toxocariasis.

Introduction

Eosinophilic ascites is a very rare disorder. It can be a manifestation of eosinophilic gastroenteritis in its serosal form and it is also associated with hypereosinophilic syndrome, malignancy, vasculitis, parasitic infections and peritoneal dialysis (1). The origin of eosinophilic gastroenteritis is unknown and can be associated with allergic conditions ; the diagnosis is confirmed by a characteristic biopsy and/or eosinophilic ascitic fluid in absence of known causes of eosinophilia (2). Among all infections, the ones produced by invasive helminth parasites should be initially ruled out. These infections usually present with peripheral eosinophilia but the presence of eosinophilic ascites is exceptional. The few cases reported about this association and the importance of taking the parasitic infections into account in all patients with eosinophilia and gastrointestinal symptoms motivated the present case report.

Case report

A 61-year-old man was admitted to our hospital with a 2-month history of abdominal pain associated with food intolerance, diarrhea, bloating and weight gain. His history highlights included allergy to fish and allergic rhinitis. The patient also reported that he had underwent an exploratory laparotomy for ascites of undetermined origin ten years ago and remained asymptomatic until the present illness. He works as a truck driver carrying farm products to neighboring countries. He denied current use of alcohol, tobacco or recreational drugs. On examination he was lucid and afebrile ; abdomen was distended and nontender ; bulging flanks compatible with ascites without collateral circulation were noted. There were no signs of peripheral edema or cirrhosis stigmata. Laboratory data showed : 49% hematocrit, 17 g/dL hemoglobin, 24,800 leukocytes/mm^3 (66% eosinophils) on peripheral-blood smear. Blood glucose, electrolytes, liver and renal function were normal. Erythrocyte sedimentation rate was 3 mm/hour and qualitative C reactive protein was 3 +.

Abdominal ultrasonography confirmed the presence of ascites and diagnostic paracentesis was performed. The ascitic fluid contained 30,000 white blood cells per cubic millimeter (90% eosinophils) (Fig. 1 : upper panel). Parasites were not observed in the ascitic fluid analysis ; the GRAM stain, acid-fast bacilli (AFB) and repeated bacteriologic cultures were negative. Serum total immunoglobulin E (IgE) level was elevated, at 292 IU/ml (reference value : 100-240 IU/ml). Testing was negative for antibodies to *Trichinella*, human immunodeficiency virus (HIV), hepatitis B and C viruses, antinuclear antibody (ANA), anti-DNA, antineutrophil cytoplasmic antibodies (cANCA), perinuclear antineutrophilic cytoplasmic antibodies (pANCA), antiendomysial and anti-tissue transglutaminase. Repeated stool examinations did not reveal parasitic forms or structures. Stool culture for pathogenic bacteria was negative. An esophagogastroduodenoscopy was performed and found gastric mucosa with thickened folds, antrum and duodenal bulb with superficial erosions and petechial lesions. The results of gastric biopsies were normal. Video colonoscopy was

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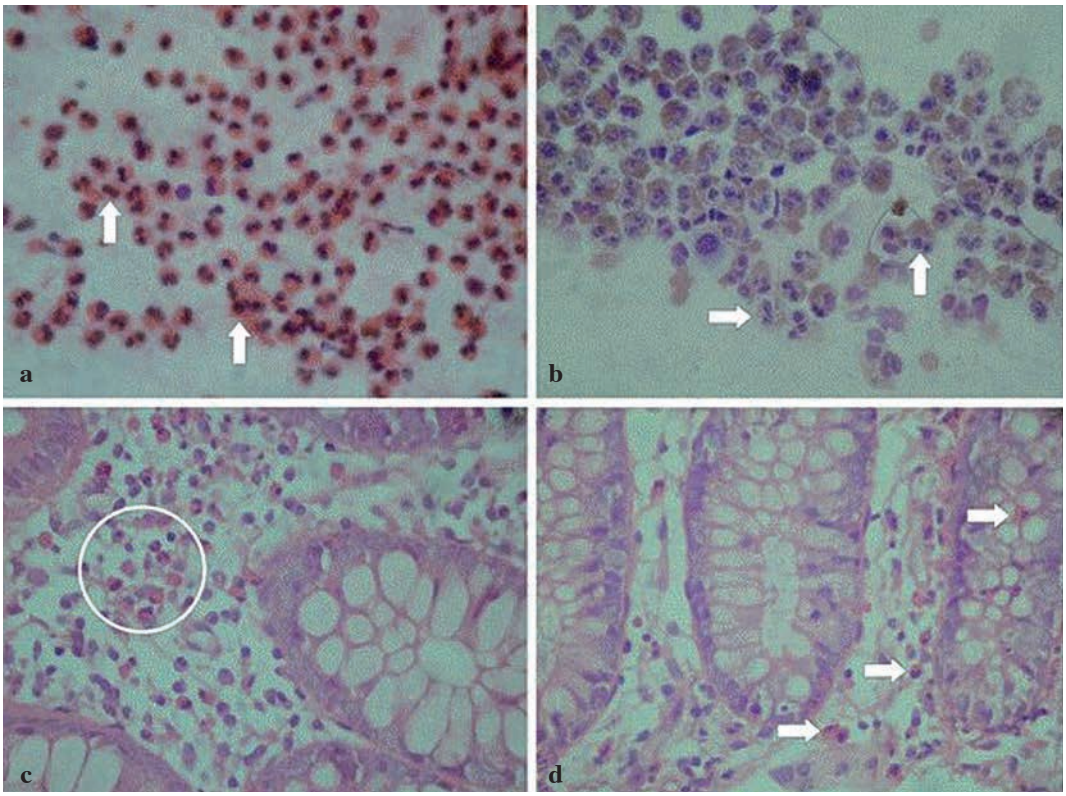

Fig. 1. — Upper panel : c itologic examination of ascitic fluid demonstrating the presence of eosinophils (arrows). a. Hematoxilin and Eosin (HE) stain ; b. May Grünwald-Giemsa stain. Lower panel : histologic examination of the colonic mucosa demonstrating eosinophilic colitis. c. High number of eosinophils within the lamina propia, between crypts (circle) ; d. Inflammatory infiltrate with dominance of eosinophils between the crypts and eosinophils migration to crypt epithelium (arrows).

unremarkable. Multiple biopsy samples were taken from colon for raised suspicion of eosinophilic gastroenteritis. The histology revealed eosinophilic colitis (Fig. 1 : lower panel). Abdominal computed tomography (CT scan) demonstrated a small pleural effusion, moderate ascites and a concentric wall thickening of the gastric antrum and duodenal bulb. Initially, the patient was treated with methylprednisone 40 mg/day. His clinical status improved ; the ascites disappeared and the peripheral eosinophil count returned to normal. Serologic testing for toxocariasis was performed (enzyme-linked immunosorbent assay [ELISA] and Western blot assay [WB]) using *Toxocara canis* excretory-secretory antigen (TES-Ag) by the second larval stage (ES/L2). The immunoglobulin G (IgG) TES-ELISA was positive with an optical-density (OD) value of 0.561 (positive cutoff value, OD ≥ 0.260) and WB assay was also positive demonstrating immunogenic bands of 70 and 55 kilodaltons (kDa) (Fig. 2). Fundoscopy did not show any pathologic finding. Albendazole was added to treatment at a daily dose of 10 mg/kg for 14 days. At present, six months later, the patient remains asymptomatic ; eosinophil blood count and total IgE level are normal.

Discussion

Eosinophilic ascites is an unusual finding. The most common related disorder is eosinophilic gastroenteritis in its serosal form. Other reported conditions are hypereosinophilic syndrome, malignancy, vasculitis, parasitic infections and peritoneal dialysis (1). The etiology of eosinophilic gastroenteritis is unknown and this disease is characterized by eosinophilic infiltration within the different layers and sections of the digestive tract. The pathogenesis is poorly understood but could be related to type I hypersensitivity response, perhaps directed at certain food products, due to tissue and peripheral eosinophilia sometimes present in these patients, high concentrations of IgE, increased allergic disorders (asthma, eczema, rhinitis, conjunctivitis, and atopy) and response to steroid treatment. The diagnosis of eosinophilic gastroenteritis is confirmed by a characteristic biopsy and/or eosinophilic ascitic fluid in absence of known causes of eosinophilia. The rarest form of eosinophilic gastroenteritis is serosal, occurring with eosinophilic ascites due to transmural eosinophilic inflammatory infiltrate ; eosinophilic pleural effusion is occasionally

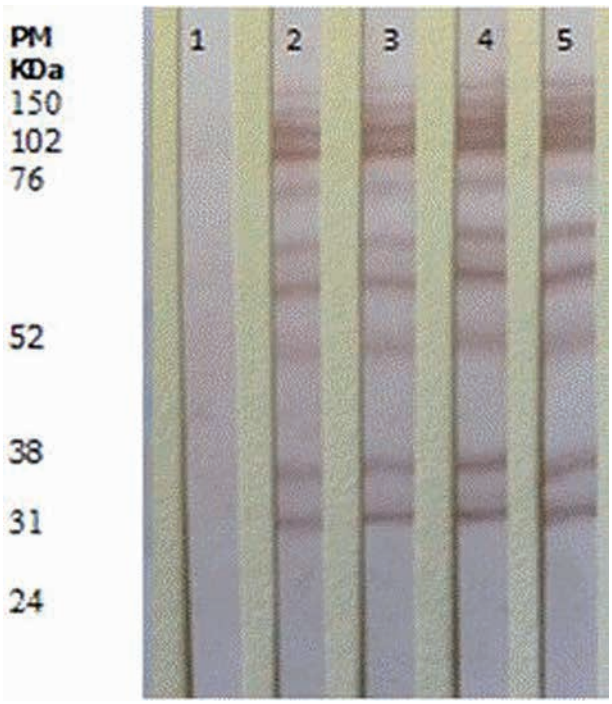

Fig. 2. — Confirmation of toxocariasis by Western-blot assay. Molecular weight markers : channel 1 : control ; channel 2 : patient sample ; channel 3 to 5 : positive results.

present. Because the disease tends to be patchy, it is recommended to take multiple biopsies during endoscopy, of both apparently healthy and affected digestive tract areas (2). The most common cause of eosinophilia worldwide is helminth infections (3). Peripheral blood, bone marrow and tissue eosinophilia are associated with the migration or presence of worms in tissues (4). The parasitic infections caused by invasive helminth nematodes (*Ascaris, Trichuris, Ancylostoma, Strongyloides, Trichinella* and *Toxocara*) should be ruled out first. Parasitic infections commonly lead to increased peripheral eosinophilic counts but are rarely associated with eosinophilic ascites (5). The toxocariasis is a geohelminthiasis prevalent in dogs and cats, whose feces contaminate the human environment, infected by accidental ingestion of embryonated eggs of the parasite. In the small bowel, the larvae penetrate the intestinal wall and they pass through the portal vein to reach the liver and lungs, and then the systemic circulation. The immune response of the host encapsulates the larvae in granulomas, which are destroyed or remain viable for years. Larvae have been found in liver, lungs, heart, eyes and brain (6). Four clinical forms of the disease are described : systemic (complete : visceral larva migrans (VLM) and incomplete) ; compartmentalized (ocular and neurological), covert and asymptomatic. Human infection is usually asymptomatic. It is diagnosed by a positive serologic test and is not always accompanied by eosinophilia. *Toxocara* larvae can be reactivated at any time and then migrate (7). The latter situation could explain the recurrence of ascites 10 years later in our patient.

The clinical scenario varies depending on the tissue invaded, the number of migrating larvae and the age of the host (6). VLM syndrome is characterized by fever, leukocytosis, persistent eosinophilia, hypergammaglobulinemia, hepatomegaly and bronchospasm (8) ; several of these symptoms were present in our patient. Sometimes the manifestations of toxocariasis resemble eosinophilic gastroenteritis (6) ; pleural effusion and ascites were rarely described as a manifestation of VLM. To our knowledge, only five cases of eosinophilic ascites associated with toxocariasis have been reported. A definitive diagnosis of human *Toxocara* infection can be achieved by pathological examination of various organs. However, such a direct parasitological assessment is difficult and uncommon, and serologic methods are the mainstay of diagnosis (9). For diagnosis, the patient's history, clinical signs and symptoms, a positive immunoserology, eosinophilia and increased total IgE levels should be taken into account (10). Peripheral blood eosinophilia, although not specific to *Toxocara* infection, has been consistently associated with VLM (9). The intensity of the eosinophilia is usually related to the intensity of the infection and the serologic response. The anti-*Toxocara* IgE antibodies are present in several cases of toxocariasis in humans and are highly specific. The total IgE level is directly proportional to the level of specific anti-*Toxocara* antibodies (7). However, in our case, IgE value was not high. The more plausible explanation is that the blood sample for IgE measurement was taken after corticoids was started. Medical imaging techniques can be used to detect and localize granulomatous lesions produced by *Toxocara* larvae (9). Examination of stools has no role in the evaluation of toxocariasis (6) because the parasite does not reach the adult form in human beings, although in our patient this exam helped rule out other parasitosis. Seropositivity is the most important marker in humans as it is observed and covers all clinical forms of toxocariasis (8,10). The best choice for serodiagnosis of the generalized forms of toxocariasis, VLM or covert toxocariasis relies upon the detection of IgG antibodies against TES-Ag (IgG TES-ELISA), after which any positive result should subsequently be checked by WB assay to avoid false positive results by cross-reactions with other helminthes (7,8,11). Some authors consider the bands bearing molecular weight of 24, 28, 30 and 35 kDa, observed in the WB, to be specific for toxocariasis (11). In our case and according to the technique used in the national reference laboratory, the WB is considered positive when bands of 120, 70, 55, 30, 32 kDa are observed ; the 70 and 55 kDa bands are considered diagnostic (12,13). A positive serology cannot distinguish between past and present infection (9). The finding of both peripheral blood eosinophilia and a positive serology is indicative of active toxocariasis (9). Although other parasitosis share similar clinical symptoms, laboratory findings and

also the eosinophilic infiltration of gastrointestinal tissues found in toxocariasis (e.g. Anisakiasis), the epidemiology data in our country, the history of fish allergy and the confirmation of toxocariasis by Western blot, allowed us to rule out other infestations. Whether a patient with toxocariasis should be treated depends on the clinical presentation or syndrome. All children and adults with acute VLM should be treated (14). At present, albendazole is the recommended drug choice, at a dose of 400 mg/day for five days (15). Glucocorticoids are the most effective agents in reducing eosinophilia (16) and are indicated for the treatment of acute inflammatory manifestations of both VLM and ocular toxocariasis (14). In our patient, initial treatment with methylprednisone resulted in rapid clinical and laboratory improvement. For post-treatment follow-up, only eosinophil count appears to be helpful (9). The dosage of IgG antibodies is useful for the diagnosis of *Toxocara* infection but not for monitoring patients because the values remain elevated for long periods of time and even after treatment (9,10,11).

Symptomatic toxocariasis in adults is rarely observed in clinical practice. For diagnosis, clinicians must have a high degree of suspicion supported by the presence of eosinophilia and confirmatory serology. In conclusion, we emphasize the importance of taking parasitic diseases into account in patients presenting with gastrointestinal symptoms, eosinophilia and eosinophilic infiltration of gastrointestinal tissues as well as considering the use of not only parasitological but also serological studies to confirm the diagnosis.

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