Pediatric fascioliasis: report of three cases

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Fascioliasis is an uncommon hepatobiliary disease in children. Ultrasonographic, computed tomography (CT) and magnetic resonance imaging (MRI) findings of the disease have been thoroughly described in the last decade. These radiological findings play an important role in the differential diagnosis of the disease since it may clinically mimic several hepatobiliary and systemic diseases.

We report three children with fascioliasis, emphasizing the radiological findings in both the hepatic and biliary phases of the disease. If radiological findings are not appropriately interpreted, the diagnosis may be overlooked or delayed. In all three cases the serological confirmation was performed by ELISA method. Patients were treated with oral triclabendazole and soon recovered.

Key words: fascioliasis, liver, bile ducts, ultrasonography, computed tomography.

Fascioliasis is a disease of the hepatobiliary system caused by the trematode Fasciola hepatica. Fasciola hepatica is a universal intestinal parasite of sheep and cattle. It is transmitted to humans via contaminated water or green vegetables, mostly watercress. The parasite is 2-3 cm long and motile. It causes necrosis and abscess in the liver parenchyma, which is followed by hyperplasia of the biliary ductal epithelium and periportal fibrosis[1]. The disease is endemic in some Middle and Far East countries, but has been reported worldwide[2-5].

An increasing number of cases have been reported, probably due to the widespread use of abdominal ultrasonography (US) and computed tomography (CT) which both show typical radiological findings of the disease[6]. However, since the disease may mimic a wide spectrum of hepatic and biliary disorders, diagnosis may be delayed and difficult. Children with fascioliasis have also been reported in the literature[4,5,7]. However, although liver parenchymal and biliary tract abnormalities are frequently observed by CT and US, the detection rate of Fasciola hepatica is disappointingly low despite the parasite's relatively large size. Radiological findings must therefore be interpreted together with other clinical measurements.

We report three children with fascioliasis to emphasize the importance of the US and CT findings in diagnosis.

Case Reports

Case 1

A 15-year-old girl was referred for abdominal US with periumbilical pain, nausea, intermittent vomiting, weight loss and constipation for the last 11 months. Her weight was lower than third percentile and tenderness to palpation was found in the epigastrium and right-upper quadrant. Endoscopic examination showed esophagitis, antral gastritis, and a solitary rectal ulcer. Histopathologic study confirmed diffuse gastritis with Helicobacter pylori and nonspecific colitis. A complete blood count was unremarkable except mild eosinophilia. Her initial laboratory results revealed normal serum biochemical tests, erythrocyte sedimentation rate (ESR), urinalysis, and stool examination. Gliadin antibodies and C-reactive protein (CRP) were negative.

Ultrasonography demonstrated multiple linear and spherical motile echogenic particles within the gallbladder (Fig. 1). The particles were floating in bile and did not have acoustic shadowing. Minimal dilatation of the intrahepatic biliary ducts were detected in the

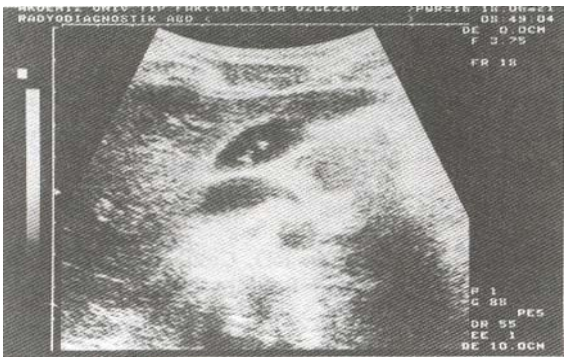

Fig. 1. Sonography shows echogenic, conglomerate particles without acoustic shadowing, floating in the gallbladder.

liver by abdominal CT. Fasciola specific IgG was found to be positive by serological test (enzyme-linked immunosorbent assay [ELISA] that detecs antibody to the excretory-secretory [E-S] antigen products from adult F. hepatica). These antigens are prepared at Ege University, Parasitology Department; thus, the biliary phase of fascioliasis was confirmed. After getting informed consent, the patient was treated with a single dose of oral triclabendazole 10 mg/kg (Egaten, Novartis, Basel, Switzerland). The abdominal cramps then gradually resolved and sonographic findings disappeared within one month.

Case 2

An 11-year-old boy was evaluated for epigastric pain, nausea, and intermittent vomiting. Physical examination revealed mild epigastric tenderness. His height and weight were at 3-10th percentiles. Laboratory tests revealed an eosinophilia of 32%. His stool tests, urinalysis, ESR and serum biochemical tests were all normal. Gliadin antibodies were negative.

Ultrasonography demonstrated a few floating, linear, 1.5-2 cm echogenic foci in the gallbladder. Serology and imaging findings confirmed biliary fascioliasis. Treatment was done with a single dose of triclabendazole 10 mg/kg. The patient's abdominal pain and eosinophilia gradually resolved over one week, and subsequently within one month echogenic foci in the gallbladder disappeared.

Case 3

A nine-year-old boy was referred for abdominal US with a history of unexplained right upper quadrant pain for the last three weeks. He had been suffering from anorexia, weight loss, intermittent fever, sweating and nausea. His initial laboratory findings revealed high ESR (47 mm/hr), eosinophilia (42%), leukocytosis (19000/mm^3) and elevated alkaline phosphatase levels. Stool examination for parasites were negative. US showed ill-defined hypoechoic subcapsular lesions in the liver (Fig. 2) and enlarged periportal lymph nodes.

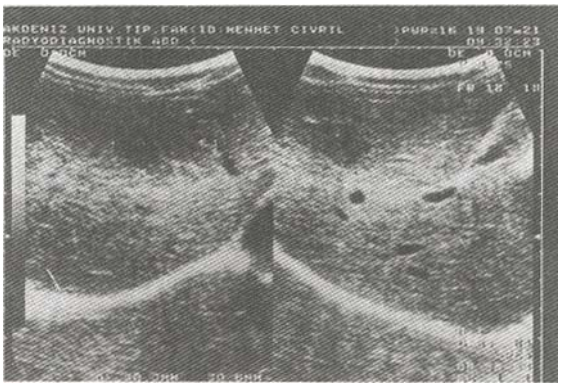

Fig. 2. Ultrasonography (US) shows heterogeneity of the liver created by multiple poorly defined hypoechoic foci in the hepatic phase of fascioliasis.

Gallbladder was normal. CT showed ill-defined confluent hypodense lesions in the liver (Fig. 3). IgG antibodies specific for Fasciola hepatica were found to be positive. He was treated with a single dose of triclobendazole (10 mg/kg of body weight). The upper quadrant pain gradually resolved within two weeks and the patient became asymptomatic.

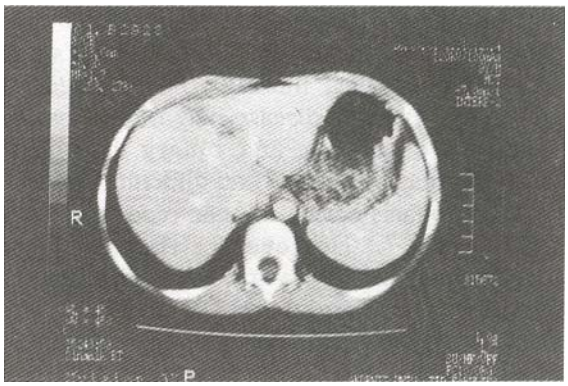

Fig. 3. Multiple ill-defined hypodense nonenhancing nodules are seen in the contrast-enhanced computed tomography (CT) image of the liver.

Discussion

Hepatobiliary fascioliasis is uncommon in children. Since it is rare and since it may mimic several hepatobiliary disorders, it should be considered in the differential diagnosis of children with fever, right upper quadrant pain, nausea, vomiting, anorexia and weight loss. The symptoms may be mild and transient in the hepatic phase but the biliary phase may continue for months or even years. The parasite induces hepatitis by producing confluent foci of coagulation necrosis and microabcesses surrounded by eosinophilic infiltration[1,8]. Later the biliary system is involved if the diagnosis is delayed or ineffective. In this phase, the parasites invade the biliary system causing papillary hyperplasia of the epithelium and periductal lymphangiectasia[8].

Symptoms and laboratory findings such as abnormal liver function tests, high ESR and leukocytosis are not specific enough to rule out other causes of hepatitis, liver abscess, brucellosis, cholecystitis, cholestasis or cholangitis due to other infections (ascariasis, echinococcosis, clonorchiasis and AIDS). Eosinophilia is the most striking laboratory finding that should alert the physician.

Ultrasonographic findings in the initial hepatic phase may easily be overlooked since the lesions may occasionally present as isoechoic or hardly depictable hypoechoic nodules of 1-3 cm in diameter[6]. These may coalesce to form larger nodules.

Portal venous phase CT is more sensitive in this phase because the lesions do not enhance and better show up surrounded by enhanced liver parenchyma[6,8]. Conversely, US is more sensitive than CT in the biliary phase since thickening of the major bile ducts, motile or dead parasites within the ducts or gallbladder, mild dilatation and edema of the biliary ducts and periportal lymph node enlargement are readily detected by US[6,8]. The subtle periportal hypodensity that we have seen in one case reflects periductal lymphangiectasia according to the experimental work by Han et al.[8]. Despite these typical radiological findings, diagnosis may be delayed if the patient is not referred to US-CT imaging or serological testing with a high index of suspicion. If a parasitic disease is considered based o eosinophilia, classical stool tests may repeatedly be negative for Fasciola hepatica eggs. Fasciola hepatica eggs are rarely found in stool even in the biliary phase[1,6].

The definitive diagnosis is achieved by serology in the initial hepatic phase[1]. In the biliary phase, demonstration of eggs in the bile or stool with several methods including fine-needle aspiration of bile from the gallbladder, or endoscopic or percutaneous transhepatic bile sampling from the duodenum or biliary ducts is diagnostic[1,6,8,9].

Serology is highly sensitive and specific both in the hepatic and biliary phases (approaching 100%)[1]. Sometimes moving parasite(s) within the gallbladder or biliary ducts may be observed by US and this finding alone is diagnostic for fascioliasis[6,8].

The hepatic parenchymal lesions are best detected by CT but they are less specific, and several disease processes should be considered in the differential diagnosis. However, multiple-confluent non-enhancing hypodense lesions aligned within a tract abutting the liver capsule should always be regarded suspcisious for fascioliasis. The biopsy of these lesions is usually not diagnostic; eosinophilic infiltration, coagulation necrosis or microabcesses are recorded[8].

In conclusion, Fasciola hepatica infection should be considered in the differential diagnosis of children with symptoms of hepatitis and cholangitis, especially in certain parts of the world where the disease is endemic. Children of families that travel to those parts of the world may also become infected.

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