Case report

Typhoid fever with severe abdominal pain: diagnosis and clinical findings using abdomen ultrasonogram, hematology-cell analysis and the Widal test

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Abstract

A six-year-old boy with high-grade fever and abdominal pain in the epigastric region was examined with ultrasonogram of the abdomen. Hematology-cell analysis, serology (Widal test), urine analysis, and blood cultures were also performed. The ultrasonogram was helpful for the identification of multiple organ involvement with *Salmonella typhi*. The results revealed mild hepatosplenomegaly, minimal ascitis, and mesenteric lympoadenopathy. Hematological analysis showed a white blood count of 6,300 cells mL-1; a red blood cell count of 4.54 million/cu mm. The erythrocyte sedimentation rate (ESR) was 24 mm/1 hr; hemoglobin level of 11.5 g/dl; and a platelet count of 206,000 cells/mL. The patient's serum was agglutinated with lipopolysaccharide (TO), the titre value was 1:320 dilution, and flagellar antigen (TH) titre was 1:640. The patient was diagnosed with typhoid fever. Ceftriaxone was given intravenously for five days and the patient fully recovered.

Key words: typhoid fever; ultrasonogram; Widal test

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Introduction

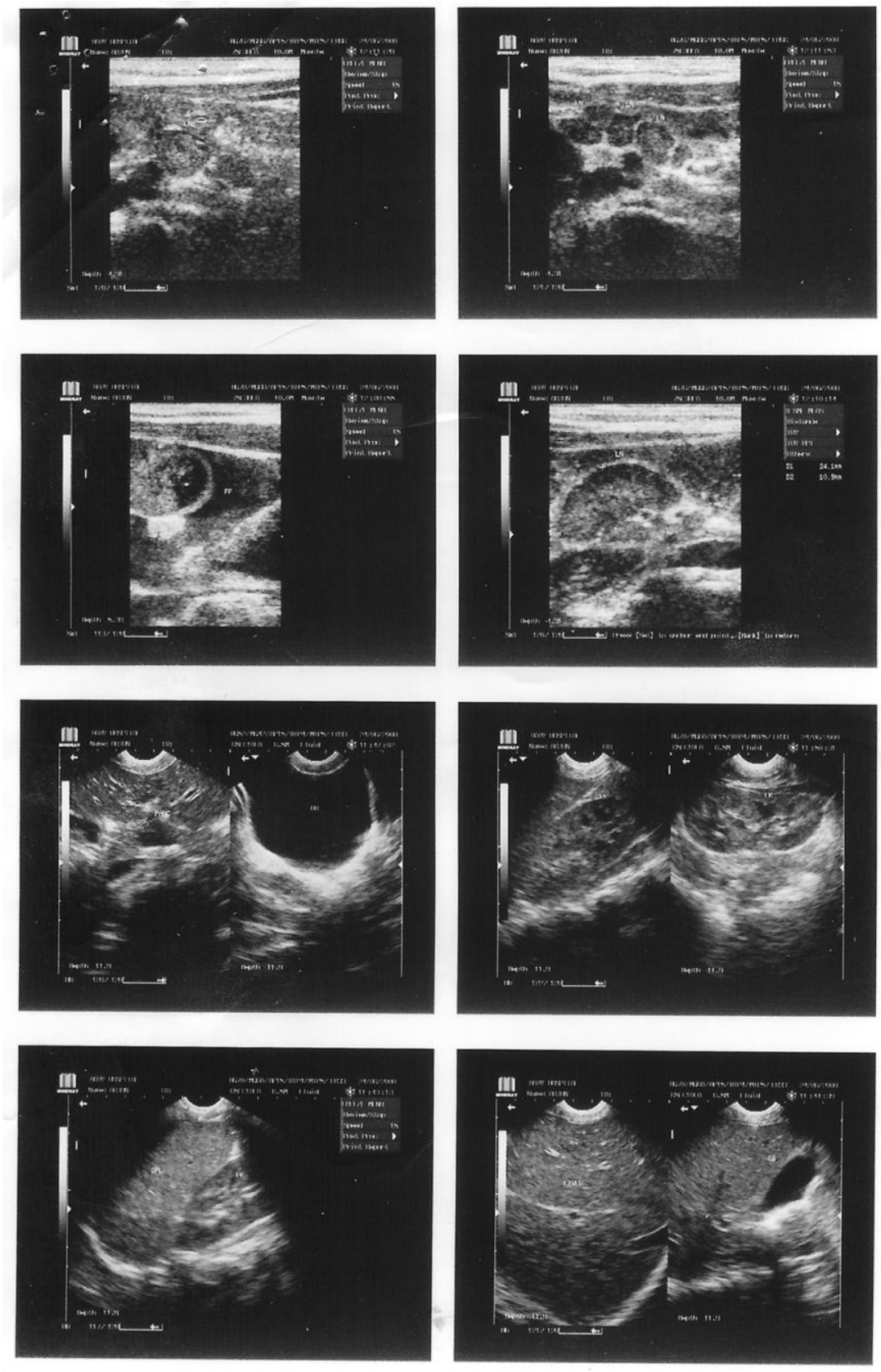
Typhoid fever remains a serious health threat in developing countries including India [1], principally owing to the problem of unsafe drinking-water, inadequate sewage disposal and flooding. The organism is transmitted by the faecal-oral route; thus the disease is often associated with poor sanitation and hygiene. The signs and symptoms of typhoid fever are nonspecific [2]. Even under the best conditions, the organism may not be isolated from blood, especially after antimicrobial treatment is started. Simpler methods for the diagnosis of typhoid fever would be very useful, especially in developing countries where the disease is endemic. Serologic tests based on antibody detection have been suggested as a rapid and easy alternative to culture for the diagnosis of typhoid. The most widely used serologic test is the Widal test [1]. When treating typhoid fever, the widespread multidrug resistance against first-line fluorquinolones should be considered, treatment should include a third-generation cephalosporin such as ceftriaxone.

Case report

A six-year-old boy admitted to Baby Hospital, Erode, India, with a one-week history of intermittent high-grade fever (not associated with rigor), headache, malaise, nausea, and epigastric pain. The physical examination revealed tenderness in the right upper quadrant and lower abdomen. The liver and spleen were not palpable and body temperature was 100°F. Ultrasonogram of the abdomen revealed hepatomegaly (11 cm) and intrahepatic biliary radicals were not dilated, and gall bladder, bile ducts, pancreas and kidney were found normal. No other abnormalities were detected. Spleen size was enlarged at 8.9 cm. Overall results revealed multiple enlarged mesenteric lymph nodes, with the largest measuring 24 x 11 mm in size; mild hepatosplenomegaly; minimal ascitis; and mesenteric lympoadenopathy (Figure 1).

Hemotological analysis (CPC Medical systemz pvt., Chennai, India) revealed a white blood count of 6,300 cells mL-1 (normal value 3,500-10,000 cells mL-1) and a platelet count 206000 cells mL-1. Lymphocytes were slightly elevated at 51.9%

Figure1. Real time B-mode ultrasonogram of abdomen impression with hepatosplenomegaly, minimal ascitis and mesenteric lympoadenopathy



(normal value 17.0-48.0%), with granulocyte at 42% (normal value 43.0 – 76.0%). Mean corpuscular volume (MCV) was within a normal range at 73.2 (normal value 80-97 cu.mm) whereas mean corpuscular hemoglobin (MCH) was low at 23.8 (normal value 26.5- 33.5 pg). The erythrocyte sedimentation rate was 1 24 mm/hr, and the hemoglobin level was 11.5 g/dl, Widal testing revealed the patient's serum was agglutinated with the lipopolysaccharide (TO); the titre value was 1:320 dilution and flagellar (TH) titre value was 1:640 dilution; and antigen of serotype *S.* Typhi was present.

The urine analysis report exhibited pus cells 2-3; occasional RBC; epithelial cells 1-2; bile salt and bile pigment were negative; and bacterial cells absent. Blood cultures were negative with no history of antimicrobial therapy in the previous seven days.

The patient received ceftriaxone intravenously at 750 mg per day along with Ranial (ranitidine) and Pantoprazole in two divided doses, and oral calpol (paracetamol, diphenhydramine hydrochloride) syrup once every four hours until the axiliary temperature remained below 100°F for at least 24 hours. The therapy was then maintained for an additional five days' at the same dose. All data were recorded on previously prepared special forms. The patient was examined twice daily and symptoms and clinical signs recorded. Axiliary temperature, arterial blood pressure, respiratory rate and pulse rate were recorded every six hours. The response to treatment was assessed by improvement in symptoms and signs of typhoid fever. After three days of treatment, clinical symptoms such as fever, headache, malaise, nausea, and abdominal pain disappeared. No adverse effects were observed clinically and biochemically from the patient's treatment with ceftriaxone. An infection is considered clinically cured if clinical signs and symptoms are resolved and the patient remains well during follow-up. Cefixime was administered at 100 mg, pantacid (Pantoprazole) 20 mg, and becosule (vitamin B complex) 5 ml per day for one week to avoid relapse.

Discussion

Typhoid is still a serious disease, with mortality that ranges between 5% and 20% [3]. Global estimates are difficult; however, the greatest estimate of burden of disease is in Asia. The World Health Organization statistics estimate over 22 million cases annually, with at least 200,000 deaths [4]. Annual incidence rates of up to 980 per 100,000 have been reported from Delhi, India [5].

The present study's clinical parameters of the patient have been previously described and provide useful markers for typhoid fever in children with prolonged fever that could be lead to hepatosplenomegaly and lympho-adenopathy. Tatli *et al.* [6] reported similar common presenting symptoms, *i.e.*, high-grade fever with headache, myalgia and anorexia. Another study reported that 75% of patients had hepatomegaly and 54% of patients had splenomegaly [7], while others have reported that typhoid fever in children was associated with fewer chills than in adults[3,5]. This difference may be due to poorer verbal reporting by pediatric patients. Gastrointestinal symptoms, such as abdominal pain, diarrhea, and nausea/vomiting, were the second most common manifestations of typhoid. Eosinopenia has also been a common and useful marker for typhoid fever in children with prolonged fever and hepatosplenomegaly [7,2]. The Widal tests in our study revealed that the H antigen had a higher titer value than the O antigen, and other reports have described similar observations [6,2]. In our study, ceftriaxone was used for five days and no relapse occurred during follow-up. This therapy was based on previous treatment of children with typhoid fever in our hospital. The results suggest that the course of therapy used in this study had a better outcome than the use of short-term ceftriaxone. Similar results were observed by Tatli *et al.* [6]; in their study, ceftriaxone was used for about 10 days and no relapse occurred during follow-up. Acharya *et al.* [8] reported intravenous doses of ceftriaxone75mg/kg once daily in children for five days, with clinical cure defervescence without complication or relapse, and no further treatment was required. The recommended treatment of multidrug-resistant (MDR) typhoid cases with broad-spectrum cephalosporins is uncertain; in some studies children with culture-proven MDR typhoid cases were treated with intravenous ceftriaxone (CRO) (65 mg/kg of body weight/day) for seven days (short course; *n* 529) or 14 days (conventional; *n* 528). The response to therapy was evaluated by the serial monitoring of the typhoid morbidity. In contrast to the conventional therapy, 14% of the children receiving CRO for seven days had a confirmed bacteriological relapse within four weeks of stopping therapy [9].

Appropriate antibiotic treatment is important to cure typhoid fever with minimal complications. The choice of drug and the duration of therapy depend on

several factors such as the clinical severity of the case, the patient's condition, and drug resistance, as well as the physician's experience and available resources. The increasing antibiotic resistance of *S. typhi* is a concern. The treatment of typhoid fever with third-generation cephalosporins, such as ceftriaxone is associated with higher cure rates.

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