Sepsis and multiple brain abscesses caused by Salmonella paratyphi B in an infant: Successful treatment with sulbactam-ampicillin and surgical drainage

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Abscess formation by Salmonella species is an uncommon but significant manifestation of salmonellosis, because this type of infection has high morbidity and mortality rates and is a potential nosocomial hazard. In infants, history of consumption of contaminated water should be especially quired.

We report a case who had sepsis and multiple brain abscesses due to Salmonella paratyphi B and who responded to sulbactam-ampicillin (SAM) therapy. Sulbactam-ampicillin combination may be preferable due to its immunomodulator effect.

Key words: abscess, Salmonella, sulbactam-ampicillin.

Supurative abscesses due to Salmonella are reported in less than two percent of patients, and Salmonella choleraesuis is responsible for more than 50 percent of these[1]. However, symptomatic Salmonella infections usually manifest as self-limited gastrointestinal distress unless the patient has underlying systemic disease such as sickle cell anemia or immunodeficiency[1-4]. Abscess due to Salmonella has been described in lymph nodes, perineal tissues, testes, renal parenchyma, subphrenic spaces and, rarely, in the brain[1-5].

Case Report

A two-month-old female infant, suffering from dyspnea, abdominal distention and constipation for the previous two days, was admitted to the hospital in September 1998. Although she was a breast/fed infant, she was given contaminated tap-water occasionally. Physical examination on admission showed temperature 36 °C, pulse 164 beat/min, and blood pressure 72/33 mmHg. There was no skin rash, and her abdomen was distended.

Laboratory evaluation showed hemoglobin 7.9 g/dl, leukocyte count $23x10^9$/µl (segmented 60%, band 3% and lymphocytes 37%) and platelets $160x10^9$/µl. Erythrocyte sedimentation rate was 56 mm/h. Serum electrolytes, blood gases, and liver and kidney functions were all normal. Her roentgenogram showed hyperinflation of the lung and intestines (Fig. 1). Cerebrospinal fluid (CSF) analysis at the beginning showed 40 polymorph/µl, glucose 12 mg/dl (normal range 75-115 mg/dl), and protein 300 mg/dl (normal range 15-45 mg/dl). Ceftriaxone and amikacin were given empirically for sepsis suspicion after blood urine and stool cultures were taken; over the metronidazole was added to this therapy for the probability of necrotizing enterocolitis. Over the subsequent five days, her abdominal distention increased and constipation continued. CSF culture on the 10^{th} day yielded Salmonella paratyphi B, but there were no pathogens in any other cultures. Then, according to the antibiogram, sulbactam ampicilline (SAM) was given and the other antibiotics were stopped. The patient had generalized convulsions on the 15^{th} day. Computerized tomography (CT) scan showed multiple brain abscesses (Fig. 2). Surgical drainage was performed and the same pathogen was also isolated from this material. Ventriculo-peritoneal shunt was placed after the CSF was completely clear.

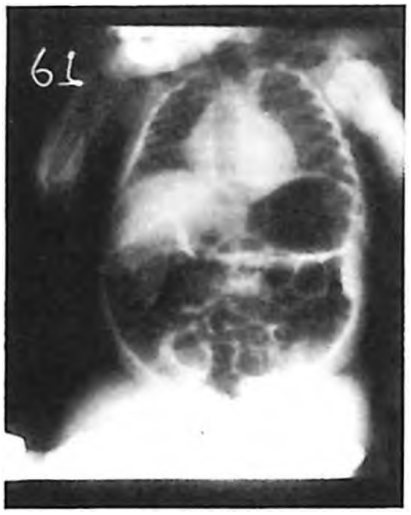

Fig. 1. The roentgenogram showing hyperinflation of the lungs and intestines.

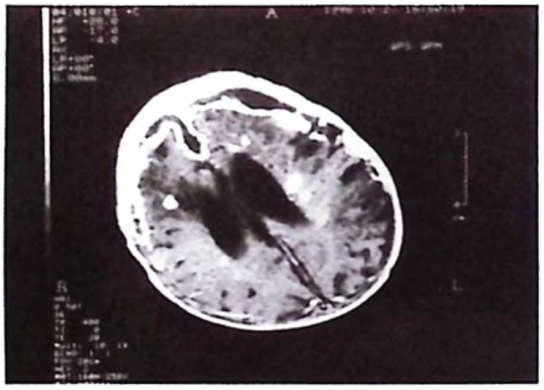

Fig. 2. Computerized tomography (CT) scanshowing multiple brain abscesses.

Discussion

Humans, who are the only hosts of Salmonella species, usually ingest salmonellae from contaminated food, water and milk[6]. The salmonellae produce disease by adhering to and then penetrating intestinal mucosal cells by endocytosis, and bacterial proliferation occurs in the lamina propria and mesenteric nodes. Salmonellae seem to survive in an intracellular location, and are protected from antibodies and antibiotics[3].

This gastrointestinal disease course in humans is usually limited unless the patient has underlying systemic disease such as sickle cell anemia or immunodeficiency[3,4]. In recent years, a major cause of immunocompromisation is human immunodeficiency virus (HIV) infection[3,4]. There was no HIV infection, but cellular and humoral immunity in our case was not completely developed at two months of age, and there was a history of contaminated water consumption. Salmonella infection in the first two years of life exhibits certain differences from the clinical course in adults[3]. Bradycardia and leukopenia are not the rule in this group[3]; our patient had leukocytosis and tachycardia. In most cases, supurative abscesses have been reported due to Salmonella choleraesuis and typhi[1,3]. Salmonella paratyphi B was isolated in our case.

Since Salmonella is seldom suspected as a cause of soft tissue infections, there is usually a dangerous delay in the institution of appropriate antimicrobial therapy and isolation procedures[6]. Abdominal distention, which is a later finding and could lead to intestinal perforation, is well known in adults[3]. Abdominal distention and history of contaminated water consumption in our case alerted us to initiate metronidazole at the beginning of the therapy for the possibility of anerobic infection. Atypically, there was hyperinflation of the lungs in our case. We changed the therapy when the CSF culture was positive for Salmonella.

There were successful treatments with chloramphenicol[3], ciprofloxacin[7] and 3rd generation cephalosporins[8]. But we preferred SAM therapy according to the antibiogram, because there was no sign of improvement with ceftriaxone and amikacin therapy. Sulbactam combination with ampicillin is preferable, because it has an immunomodulator efficacy in inducing the release of TNF, IL-1 alpha, and IL-6 from monocytes, and in releasing IL-4 and IFN-tau from lymphocytes[9,10].

We believe that a history of contaminated water consumption in developing countries and gastorintestinal symptoms, especially abdominal distention, should be evaluated carefully in infants. In such cases, SAM therapy is a good alternative.

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