CASE REPORT

Typhoid Fever Due to *Salmonella* Kapemba Infection in an Otherwise Healthy Middle-Aged Man

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We report the case of a patient with a *Salmonella* Kapemba infection, who suffered, 3 weeks after a holiday in Israel, occurrences of high fever and lower back pain for 10 days and icterus for 2 days before admission. Laboratory findings revealed a slight cholestasis and elevation of acute phase protein levels. In the blood culture a *Salmonella* Kapemba-type organism was cultured. The patient was afebrile for 10 days after hospitalization and then suddenly developed a temperature of 40°C again. At the same time leukopenia, thrombocytopenia, and a rise of D-dimer levels were detected. The patient was admitted to the intensive care unit for a few days, because a disseminated intravascular coagulation was suspected. With magnetic resonance imaging and bone scintigraphy no osteomyelitis or abscess formation could be found. A transesophageal ultrasonography of the heart revealed no signs of endocarditis. In multiple stool cultures no salmonellas could be detected. After antibiotic treatment with ciprofloxacin the fever and lower back pain subsided, and the patient was discharged a fortnight later. This is the first reported case of typhoid fever due to the bacterium *Salmonella* Kapemba.

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CASE REPORT

We report the case of a patient who, 3 weeks after a 14-day trip to Israel, presented with fever up to 40.2°C, icterus, anorexia, weight loss of 4 kg in 2 weeks, and lower back pain. He was not coughing and had no diarrhea. The disease began 10 days before admission to the hospital with lower back pain, nausea, vomiting, and brown urine. He had taken acetaminophen, metamizole, benzodiazepine, and nonsteroid anti-inflammatory drugs to control pain and fever.

For 10 years the patient had had hypertensive disease, which was drug treated, and he reported a chemical-toxic hepatitis caused by carboxychlorids 23 years ago.

The 57-year-old man was in a reduced health status and 184 cm tall, with a body weight of 85.6 kg and a temperature of 37.9°C. A physical examination revealed bradycardia (52 beats per min and rhythmical) and a blood pressure of 160/90 mm of Hg, and the liver was palpable at a position 5 to 6 cm mediodiaphragmatic below the right rib bow. No heart murmur was found, pulmonary, renal, and spleen findings were normal, no clinical signs of meningitis or other neurological abnormalities were found, and lymph nodes were not palpable. Pressure caused pain at the lumbar part of the spine.

Laboratory studies showed slightly elevated levels of cholestatic enzymes and transaminases. Screening for hepatitis, tuberculosis, and malaria was negative.

An X-ray of the lumbar spine revealed lumbarization of the first sacral segment with failure of fusion of the laminae of the neural arch. In ultrasonography a splenomegaly (140 by 55 mm) and two renal cysts smaller than 5 cm in the left upper kidney were found. Endoscopy and magnetic resonance imaging findings of the upper gastrointestinal tract and biliary system were normal. The magnetic resonance imaging of the spine revealed a slightly increased intensity of the T2 sequence and decreased intensity of the T1 sequence between L2 and L3, giving a hint of an initial spondylitis with a minimal increased level of radioactivity in the bone scan. The trans tho racic and transesophageal ultrasound of the heart showed a left ventricular hypertrophy without valvular failure in the sense of endocarditis.

Initially no focus of the infection could be found: a chest X-ray, a urine sample, and stool samples were normal or negative. In the anaerobe blood tube a *Salmonella* serovar, Kapemba, was cultured. As the patient was without fever on the third day of hospitalization and the lower back pain was treated sufficiently with analgetics, no antibiotic treatment was initiated. Suddenly, 14 days after admission, he became very sick again with shivering and fever up to 40°C. Three blood cultures revealed the same bacterium as before: in both the aerobe and anaerobe tubes: *Salmonella* Kapemba. It is a salmonella of type D in the Kauffmann-White classification (4) and its O antigen is identical with that of *Salmonella enteritidis*. It is serologically classified with the formula 9,12:1,v:1,7 (somatic antigen [O]:flagellar antigen [H] phase I:phase II).

We began antibiotic treatment with 400 mg of the gyrase inhibitor ciprofloxacin intravenously twice a day. A decrease in all three blood cell line levels (leukocytes, 3.8/μl; hemoglobin, 13.5 g/dl; and thrombocytes, 131/μl) in combination with bradycardia and high body temperature led us to the presumptive diagnosis of a salmonella sepsis with initial disseminated intravascular coagulation. This suspicion was heightened by the finding of slightly increased amounts of D-dimers (1.0 mg/...
As a result the patient was transferred to the intensive care unit. A transesophageal echocardiography did not show signs of endocarditis, and a colonoscopy did not reveal signs of infection. Three days later the patient was retransferred, and he recovered under further antibiotic treatment. The intravenous administration was changed to an oral administration after 14 days, and the patient was dismissed with the recommendation to take the antibiotic for the whole of the next month.

Four months later the patient was well and had nearly no back pain, and the fever did not return.

Discussion. Typhoid fever is a distinctive acute systemic febrile infection of the mononuclear phagocytes usually caused by Salmonella typhi, S. paratyphi A and B, and occasionally S. typhimurium. Due to improvements in environmental sanitation in the United States the incidence of typhoid cases dropped to 0.2 per population of 100,000 in the last 50 years. At the same time the infections acquired abroad increased over 60%. The bacterium is endemic to Mexico, Peru, Chile, India, Pakistan, Egypt, and Indonesia (6).

The most common infection route of the almost always human-adapted salmonella is contaminated water or food ingestion of more than 100,000 bacteria. The organisms invade the upper small bowel and produce a transient bacteremia before they are phagocytized by mononuclear cells and multiply intracellularly. The incubation period varies from 3 to 60 days and depends on the number of ingested bacteria and the patient’s immune status.

The disease usually begins with a gradual rise of body temperature to 40 to 41°C and is associated with headache and malaise. It is characterized by a prolonged fever of 4 to 8 weeks if untreated. Typical findings are bradycardia, leukopenia, and sometimes pancytopenia, along with “rose spots” on the chest and abdomen. In severe cases it is complicated by disseminated intravascular coagulation, encephalomenigitis, necrotizing cholecystitis, intestinal bleeding and perforation, osteomyelitis, nephritis, and infections of other parenchymatous organs. The outcome is lethal in 2% of cases. Three to five percent of patients, some of whom never have symptoms, become long-term carriers.

The patient mentioned above did not suffer from abdominal cramping or diarrhea, and in several stool samples no bacterium could be cultured. Because of the initial fever and the slightly elevated level of bilirubin, it was first suggested to be a spontaneous loss of a gall stone. The choledothas duct could not be visualized by two retrograde endoscopic cholangiopancreatographies, and a gall culture for a microbiological investigation was not taken, because the patient was afebrile at that time. The bile system was shown to be absolutely normal with the magnetic resonance cholangiopancreatography. Because of the transient icterus, the positive blood cultures, and the return of the fever without any positive stool culture for salmonellae, the source of the bacterium was thought to be the biliary system.

This was actually the first time that this Salmonella serovar has been isolated in Ludwigshafen. A review of the existing literature showed very few studies of this organism after its first description in 1954 by Kaufmann et al. (3, 4). In the existing literature this serovar has been associated with gastroenteric symptoms in humans.

Typhoid fever does not provide much information. Horvath in 1976 described a cerebral and cerebrocortical necrosis caused by a Salmonella Kapemba infection in a newborn (2). Ketyi et al., also Hungarians, found in 1979 that the heat-labile enterotoxin of Salmonella Kapemba fails to exert a biological effect, although it is antigenically related to the heat-labile enterotoxin of Escherichia coli (5). A Spanish group found that Salmonella Kapemba is one of the most commonly isolated serotypes in irrigation waters and crops. In humans, S. typhimurium and S. enteritidis were found to be the most common (1).

According to our national reference center for salmonella and enteritis infections Salmonella Kapemba is a seldom-encountered but universal strain without any endemic preference. Most of the infections with this bacterium are accompanied by gastroenteritis with typhoid symptoms in only very few cases. It is not known as an exceptionally virulent strain. Israel is not known to be a region where this type is endemic. We are not sure that this case of typhoid fever is due to the virulence of the bacterium alone, and we do not know if there is a special disposition for this reaction in our patient.

This is the first reported case of a patient with typhoid fever due to Salmonella Kapemba without any gastroenteric symptoms.

REFERENCES