* Corresponding author. Mailing address: Department of Internal Medicine, Kitasato University School of Medicine, 1-15-1 Kitasato, Sagamihara, Kanagawa, 228 Japan. Phone: 81-427-78-9347. Fax: 81-427-78-8441. E-mail: shige@med.kitasato-u.ac.jp.

Yersinia enterocolitica serotype O:8 Septicemia in an Otherwise Healthy Adult: Analysis of Chromosome DNA Pattern by Pulsed-Field Gel Electrophoresis

SHIGERU HOSAKA,1,* MASUMI UCHIYAMA,1 MAMORU ISHIKAWA,1 TOHRU AKAHOSHI,1 HIROBUMI KONDO,1 CHIEKO SHIMAUCHI,2 TAKESHI SASAHARA,2 AND MATSUHISA INOUE2

Departments of Internal Medicine1 and Microbiology,2 Kitasato University School of Medicine, 1-15-1 Kitasato, Sagamihara, Kanagawa, 228 Japan

Received 12 June 1997/Returned for modification 24 July 1997/Accepted 19 September 1997

We report the first case of blood-culture-positive Yersinia enterocolitica serotype O:8 septicemia in Japan. Y. enterocolitica serotype O:8 infection is very rare, but chromosomal DNA analysis suggested that this bacterium may persist latently in healthy carriers throughout Japan.

Yersinia enterocolitica is enteropathogenic for humans and rodents. Serotype O:8 has been considered the most pathogenic among those of Y. enterocolitica, and outbreaks associated with serotype O:8 have been documented in North America (1, 2, 5). However, Y. enterocolitica serotype O:8 infection is rare in Japan; it has been found sporadically and solely limited to Aomori Prefecture (6, 7, 20). Here we report a case of Y. enterocolitica serotype O:8 septicemia in an area of Japan outside of Aomori Prefecture. We have analyzed the chromosome DNA by pulsed-field gel electrophoresis (PFGE).

A 47-year-old Japanese man living in Kanagawa Prefecture, located 750 mi south of Aomori Prefecture, was admitted to Kitasato University Hospital because of high fever, sore throat, unproductive cough, polyarthralgia, and skin rash on 18 June 1996. He did not have gastrointestinal complaints and previous illnesses. On physical examination, his temperature was 38.5°C. The pharynx appeared reddish. Chest findings were negative. Mild hepatitis was noted. Active synovitis was evident in the bilateral knee and ankle joints. Small, tender skin lesions were present on his trunk and the extremities. Laboratory findings showed a blood gas analysis as follows: pH 7.498; PaO2, 67.5 torr; PCO2, 34.7 torr; HCO3−, 26.9 mmol/liter. Urinalysis results were as follows: protein 1+, 20 to 30 leukocytes per high-power field, 5 to 8 erythrocytes per high-power field, granular and hyaline casts positive; leukocyte count, 20,700/mm3; erythrocyte sedimentation rate, 38.5°C. The pharynx appeared reddish. Chest findings were negative. Mild hepatitis was noted. Active synovitis was evident in the bilateral knee and ankle joints. Small, tender skin lesions were present on his trunk and the extremities. Laboratory findings showed a blood gas analysis as follows: pH 7.498; PaO2, 67.5 torr; PCO2, 34.7 torr; HCO3−, 26.9 mmol/liter. Urinalysis results were as follows: protein 1+, 20 to 30 erythrocytes per high-power field, 5 to 8 leukocytes per high-power field, granular and hyaline casts positive; leukocyte count, 19,700/mm3; erythrocyte sedimentation rate, 110 mm/h; total bilirubin, 1.2 mg/dl; glutamic-oxaloacetic transaminase, 78 IU/liter; glutamic pyruvic transaminase, 98 IU/liter; lactate dehydrogenase, 458 IU/liter; alkaline phosphatase, 702 IU/liter; C-reactive protein, 13,848 mg/dl. Chest X-ray and computerized tomography scan showed tiny nodular lesions in the bilateral lung fields. Pathological findings for the skin biopsy specimens were erythema nodosum. On the third day after his admission, treatment with 1 g of panipenem-betamipron was started because the blood culture grew gram-negative rods. The blood specimens were drawn into a Bactec culture bottle (Becton Dickinson, Sparks, Md.), and skin biopsy specimens were cultured directly on Mueller-Hinton agar, MacConkey agar, and bromthymol blue-lactose agar plates at 35°C. A stool culture was not performed because the patient had no gastro-
intestinal symptoms is considered to be extremely unusual. In addition, this is the first reported case of a blood culture-positive septicemia of *Y. enterocolitica* serotype O:8 in Japan.

Food-borne transmission of *Y. enterocolitica* has been suggested; however, a specific food has not been determined for our patient. Furthermore, the patient had not been exposed to small rodents, which are considered to be carriers of this pathogen in Japan (6, 8, 21), and had not traveled to Aomori Prefecture.

Strains of the same evolutionary lineage should show similar or identical patterns by PFGE (14, 15). The result of our PFGE analysis may indicate that the same strain is distributed in both Aomori and Kanagawa prefectures. The 70-kb plasmid is shown to be related to the virulence of *Y. enterocolitica* (10, 16), such as in proliferation in the host tissue and establishment of infection (13). We speculated that strain KU14 lost the 70-kb virulence plasmid under culture conditions (9, 17).

From our experience, *Y. enterocolitica* is not a common causative pathogen for septicemia, but its presence should be considered in healthy subjects with signs of septic features, even if they do not have symptoms of gastroenteritis. *Y. enterocolitica* serotype O:8 infection is still uncommon in our community, but it should be emphasized that the bacterium may persist latently in healthy carriers throughout Japan and possess a potential virulence even in immunocompetent hosts.

FIG. 1. PFGE patterns of *XbaI*-digested genomic DNA from *Y. enterocolitica*. Lanes 1 and 2, serotype O:3; lanes 3 to 7, serotype O:8; lane 8, strain KU14; lanes M, the sizes of yeast chromosomal DNA standards and λ DNA ladder standards are indicated on the left and on the right of the figure, respectively.

REFERENCES