Plesiomonas shigelloides Bacteremia in a Healthy Girl with Mild Gastroenteritis

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Plesiomonas shigelloides is an oxidase- and indole-positive, facultatively anaerobic, gram-negative rod of the family Vibroniaceae, which is closely related to the families Enterobacteriaceae and Pseudomonadaceae. The bacterium is ubiquitous in nature and can be isolated from soil, water, and animals (particularly fish) (1).

The association between this organism and gastrointestinal infections is not clear. Several outbreaks of gastroenteritis in which P. shigelloides has been isolated from the stools of affected persons have been reported (6, 12, 18). On the other hand, several studies in which P. shigelloides has been isolated from the feces of symptomatic patients have not been controlled for the presence of other potential enteropathogens (3).

To our knowledge, the organism has not previously been isolated from the blood of a patient with a clinical picture of mild gastroenteritis who had an uneventful recovery. We report such a case.

Case report. The patient was a 15-year-old previously healthy girl. She lives with her parents and younger sister in the countryside in a house equipped with modern housing facilities. The only domestic animal contact the patient had was with her own dog. She visited Leningrad with her family on a recreational trip, where she claimed to have consumed only prepared foods. She dislikes seafood and did not eat them on the trip. On returning home, the younger sister of the patient had gastroenteritis of a short duration. The illness of the patient began 17 days after the trip. She became febrile (39°C), began to vomit, had up to 10 watery episodes of diarrhea daily, and had a frontal headache. She received one tablet of trimethoprim (160 mg) plus sulfadiazine (500 mg) from her general practitioner before admission to Mikkeli Central Hospital (Mikkeli, Finland), approximately 6 h before a blood sample for culture was drawn. On presentation she was clinically slightly dehydrated, her blood pressure was 100/80 (and remained so on follow-up), her pulse on admission was 120 beats per min, and an electrocardiogram showed sinus tachycardia (which became normal on rehydration). There was no meningeal, but she complained of a frontal headache. She received parenteral fluid replacement for 50 h. The leucocyte count was 6.3 × 10⁹ to 5.3 × 10⁹/liter, the hemoglobin was 137 to 127 g/liter, the sedimentation rate was 13 mm/h, and the C-reactive protein was 64 to 44 to 20 mg/liter and negative on the final day of the 6-day hospital stay. Serum potassium was 3.3 mmol/liter on admission, and sodium was 126 mmol/liter, but both values were corrected within 24 h. The results of tests of liver function, creatinine, blood glucose, and urinary sediment were normal. There was no bacterial growth in the urine, and a pregnancy test was negative. Microscopy for Giardia lamblia and Entamoeba histolytica cysts from fecal samples was negative. Other parasites or viral gastroenteritis agents were not sought.

The patient became afebrile on the second day of admission, and the vomiting and diarrhea subsided within 5 days without intervention. She was feeling well and had a good appetite when she left the hospital. No further medical attention was needed; upon inquiry at 1 month and 3 months after the hospital stay, she said that she had been well all the time. She did not report any sequelae suggestive of arthritis, conjunctivitis, uveitis, carditis, or any other similar reactive symptoms.

Bacteriology. On the day of admission, i.e., on the third day from the start of symptoms, two blood cultures were collected at a 3-h interval. On both occasions, two bottles were drawn (Hemobact Aerobe and Anaerobe; Orion Diagnostica, Espoo, Finland). In addition, a stool sample was sent to a regional laboratory for culturing of enteric pathogens. According to the routine of the laboratory, the blood cultures were examined the next morning after incubation at 35°C. Gram-negative rods were seen in the stained smears of both bottles of the first blood culture. Subcultures on blood and chocolate-agar plates produced an oxidase-positive, fermentative, gram-negative rod which was subsequently identified as P. shigelloides by the API 20E system (API, La Balme Les Grottes, Vercieux, France). The identification, profile no. 7144204, was confirmed by conventional tube biochemical tests (19). The isolated P. shigelloides strain reacted with Shigella dysenteriae serotype 7 antisera (Wellcome Diagnostics, Temple Hill, Dartford, Great Britain), indicating that the strain belonged to the O group 22 of P. shigelloides (15). The stool culture was reported by the regional laboratory to be negative for Salmonella, Shigella, Yersinia, and Campylobacter species.

Discussion. Thus far, 12 cases of P. shigelloides bacteremia have been described; two of these patients have survived (for reviews, see references 7 and 13 and the case reports in references 11 and 20). Of these 12 patients, 10 were immunocompromised either because of perinatality or because of underlying morbidity (Hodgkin’s disease, sickle cell disease, diabetes, and the like) (1, 7). Five more cases have been described since this paper was submitted (4, 10, 13, 14). Of these four immunocompromised patients, two also died of sepsis. To date, six cases of P. shigelloides bacteremia in nonimmunocompromised patients have been reported, one of whom died (2, 15, 20).

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cell disease, Felty's syndrome, or alcoholic liver disease). Of the two immunocompetent patients, one was a bisexual male with an aortic valve prosthesis who had proctitis and fatal *P. shigelloides* sepsis. The other survived after having sustained septic arthritis and osteomyelitis (7).

These reports are in marked contrast to that of our patient, who also had bloodstream infection but who had mild or moderately severe gastroenteritis, such as might be encountered in patients with common intestinal pathogens. Finding *P. shigelloides* in the blood culture was certainly unexpected. Other pathogens could not be identified in examinations of blood and stools.

The role of *P. shigelloides* in gastroenteritis has not been firmly established. Several case reports and epidemiological studies support the role of *P. shigelloides* as an etiological agent of diarrheal illness (3). Infection with this organism has often been associated with travel to tropical and subtropical countries or with ingestion of raw seafood (7, 17). However, laboratory studies with *P. shigelloides* have generally shown it to lack properties typically found in known enteric pathogens. Tests (e.g., for enterotoxin and cytoxigen production) have been negative (5, 8, 14), but a few strains may be invasive (2). Data from volunteer studies also do not support the contention that *P. shigelloides* is etiologically related to diarrheal illness (5).

The patient we describe had *P. shigelloides* bacteremia, and the same organism was probably isolated from the stool sample but mistaken for *Pseudomonas* sp. on the xylose-lysine-deoxycholate agar culture plate because the oxidase test was the only differentiating test used. In the regional laboratory where the fecal cultures are made, screening for *P. shigelloides* is not routine. When the blood isolation was later streaked onto xylose-lysine-deoxycholate agar, it grew well with colonies closely resembling those of *Pseudomonas* strains.

The patient had received one tablet of trimethoprim-sulfadiazine 6 h before the blood and stool cultures were taken. The *P. shigelloides* strain isolated from the patient was susceptible to this antimicrobial agent as determined by standard disk diffusion testing (16). This oral, very suboptimal dose of antimicrobial therapy may, however, have had some effect on the favorable outcome and rapid improvement of our patient.

We can only speculate about the route of infection. The patient and her sister had returned from Leningrad 17 days before the patient became ill. The sister had a much shorter diarrheal illness within a week of returning from the trip; she did not need medical attention. Because of the short incubation time, usually 48 h (6), it does not seem possible that the patient got the infection in Leningrad. This assumption is corroborated by the lack of known similar infections associated with traveling to the northern parts of European Soviet Union.

The patient lives in the countryside in a building with modern facilities. It is known that *P. shigelloides* may survive in stagnant water in tropical regions (10) and that birds may be natural reservoirs of the bacterium (4). Although the bacterium may also colonize domestic animals (1), it is rare to find *P. shigelloides* in dogs (9). Whether the pet dog of our patients was the source of the infective agent is speculative.

The case we report shows that there is a need to reevaluate the pathogenicity of *P. shigelloides* in patients with bacteremia; isolation of the organism from the blood is not necessarily associated with a fatal disorder or, indeed, with a fulminant disease at all.

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**LITERATURE CITED**


