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Shigellosis in Kobe City, Japan, after School Excursion to Malaysia and Singapore

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Shigella sonnei was isolated from six high school students in Kobe, Japan after a January 2006 excursion to Malaysia and Singapore and from a member of one student's family in Kobe.

A medical facility reported a case of shigellosis to the Kobe Public Health Center on January 31, 2006. Five days earlier the patient, a 17-year-old boy, had complained of a fever (39°C), diarrhea and abdominal pain. He did not receive any antibacterial treatment, but his stool was examined in a fecal culture test. His symptoms and signs subsided on January 28. However, *S. sonnei* was isolated in the fecal culture test.

The patient had taken part in a school excursion to Malaysia and Singapore from January 21 to January 25. They left Kansai International Airport on January 21 and arrived in Malaysia via Singapore; they visited Kuala Lumpur, Malacca and Johor Bahru, then returned to Singapore on the morning of January 24. They left Singapore late at night and arrived at Kansai early in the morning of January 25.

This shigellosis was suspected to have been imported to Japan via the excursion, which included 332 students, 16 teachers and 5 couriers. After the first patient was diagnosed, all other participants in the excursion were given a fecal culture test, and *S. sonnei* was isolated from an additional five students. Moreover, a retrospective health check interview revealed that 11 students suffered from diarrhea during the excursion and 11 students developed diarrhea after the excursion. However, nobody reported their symptoms at the quarantine station upon their return to Japan. None of the teachers or couriers had any symptoms, and their fecal cultures were negative.

The five culture-positive students developed a fever (38–40°C range) and diarrhea upon their return to Japan (January 25) or on the next day. Two of them saw a physician but had no fecal examination. When the Kobe Public Health Center investigated these five students, they were already free from symptoms.

All six of the culture-positive students stayed at the same hotel and dined at the same facilities. Most of the meals were served smorgasbord style, so it was rather difficult to remember which foods were eaten or to identify the common suspect foods consumed by these six students. In this excursion, the common carriers of shigellosis are thought to include

unboiled water, juice, sliced fruits, salad, milk, ice cream, rice ball, and so on.

When *S. sonnei* was isolated from the fecal cultures of the six students, all six were recommended to have a medical consultation, followed by sterilization of their houses and a full health check, including a fecal culture test for their family members. However, no family members developed any symptoms of diarrhea and all fecal culture tests were negative.

The first reported patient (index case) was already free from symptoms of diarrhea on the reported day of January 31; therefore, antibiotics were not prescribed throughout the course of his recovery. Fecal culture was negative on both January 31 and February 6, which led to a diagnosis of full recovery from the pathogenic bacteria. However, a fecal culture test done on February 13 (20 days after his return) again detected *S. sonnei* despite the continuous absence of any symptoms since his return from the excursion.

As a secondary infection, his father developed fever and diarrhea on February 12, and 2 days later visited a medical facility for a fecal culture test. The antibacterial medication cleared his symptoms smoothly, while *S. sonnei* was isolated from his fecal culture on February 18. Thus, this secondary case was an intrafamilial infection from the son, who had never been treated with antibacterial drugs. Probably, the son continued to excrete *S. sonnei* in small amounts without clinical signs. In addition, this family had not been fully cooperative with the Kobe Public Health Center before the father's illness; sterilization of their home and guidance on clean hand-washing had not gone well. This further suggested the inducement of secondary infection.

On the other hand, the high school was cooperative in the sterilization and in carrying out health guidance on topics such as adequate hand-washing for all years of students. A subsequent health observation verified normal conditions, thus excluding any possibility of secondary infection.

Recently, a number of schools in Japan have chosen overseas destinations for their school excursions. To prevent infection, schools and boards of education ought to convey the basic principles of hygiene before the trip begins. While traveling abroad, students need to pay more attention to the contents of their meals and to washing their hands, in addition to understanding the importance of medical consultation at quarantine stations upon their return, if necessary.

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