

## Laboratory and Epidemiology Communications

# Outbreak of Enterohemorrhagic *Escherichia coli* O111 among High School Participants in Excursion to Korea

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On July 7, 2004, a health center in Kanazawa City received a report of enterohemorrhagic *Escherichia coli* (EHEC) O111 (VT1 and 2) infection. The patient was a high school student who participated in a school excursion to Korea from June 28 to July 1. Upon investigation of the 358 students who went to Korea for the school excursion, 107 responded that they had similar intestinal symptoms. The onset of the symptoms of the patients was distributed from June 28 to July 8 with a peak on July 2 (Fig. 1). As few students who did not participate in the excursion had such symptoms, infection during the excursion to Korea was strongly suspected.

From July 8 to 23, the health centers responsible for the communities with the patients examined stool specimens from 358 students, 16 teachers and 4 travel agency guides who went to Korea for the excursion, and from 337 family members of the EHEC-positive patients. EHEC was isolated from 103 individuals (98 students, 4 teachers and one family

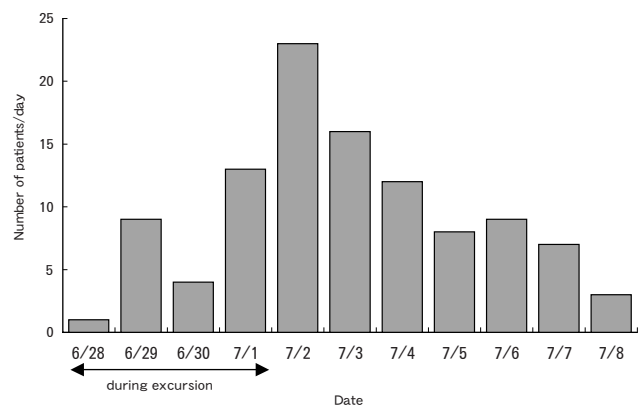


Fig. 1. Number of students with the first sign of infection.

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member). The dominant serotype of the isolated EHEC was O111, isolated from 78 individuals. O26, O146, O157, OUT and other serotypes were also isolated. There were individuals infected with two serotypes (Table 1). Among isolates of the same serotype, the pattern of pulsed-field gel electro-

Table 1. Serotypes of isolates from 103 patients (including family members of the excursion participants)

Serotype	Students positive	Teachers spositive	Family members positive	Total (with symptom)
O111:HNM (VT1, 2)	69	3	1	73 (53)
O26:H11 (VT1)	6			6 ( 2)
O146:H19 (VT2)	2			2 ( 1)
O157:H7 (VT1, 2)	1			1 ( 1)
O169:H19 (VT1)	6	1		7 ( 2)
O103:H2 (VT1)	5			5 ( 2)
OUT:H18 (VT2)	1			1 ( 1)
OUT:H19 (VT1)	1			1 ( 1)
OUT:H25 (VT1)	1			1 ( 0)
OUT:H33 (VT1)	1			1 ( 0)
O111:HNM (VT1, 2) O26:H11 (VT1)	3			3 ( 3)
O111:HNM (VT1, 2) O169:HNM (VT1)	1			1 ( 0)
O111:HNM (VT1, 2) O169:H19 (VT1)	1			1 ( 1)
Total	98	4	1	103 (67)

phoresis (PFGE) of *XbaI*-digested chromosomal DNA was identical (data not shown). In one case, we found the same PFGE pattern for EHEC O111 isolated from a patient and his younger brother, which suggested familial secondary infection. The source of infection was not identified, as investigation is difficult in foreign countries including Korea. The students recalled that they consumed insufficiently cooked meat and gravy in which the raw meat was soaked, sometimes in street restaurants.

School excursions abroad have become frequent, but it

appears that schools are ill prepared for the risk of infections during such excursions. Health risk management planning should be incorporated in the planning of excursions.

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