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Outbreak of Norovirus Gastroenteritis Involving Multiple Institutions

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We report here an outbreak of norovirus gastroenteritis in September 2006 involving three institutions in Yamanashi Prefecture, Japan: a special nursing home for the aged (Institute A), a facility for the handicapped (Institute B) and a vocational aid institution for the handicapped (commuting only) (Institute C).

On September 17, the regional health center received notification from Institute A of a patient with vomiting and diarrhea. Investigation revealed that, on September 15, an individual, identified here as Mr. A, sent from Institute B to Institute A for cleaning work, had defecated while working in the building. The floor where Mr. A defecated was cleaned up after this incident; however, Mr. A had then continued his cleaning activity throughout the building, using a mop contaminated by his feces. In the evening, all of the staff of Institute A participated in emergency evacuation training on a different floor.

Mr. A had consulted a doctor and received a prescription for medicine for intestinal disorders. In Institute B, he shared a room with three other people, two of whom had diarrhea. Examination of the feces of Mr. A's roommates using the real-time polymerase chain reaction (PCR) method described by

Kageyama et al. (1) showed the norovirus GII genome. Mr. A's fecal specimens could not be obtained for examination.

In the morning of September 17, the interior of Institute A was cleaned thoroughly by wiping with an adequately diluted hypochlorous acid solution. At midnight on the same day, however, one resident and five employees of Institute A developed diarrhea and vomiting. On the next day, emergency measures were taken (hand washing and cleaning of the environment with the hypochloride solution), and stools were collected for microbiological investigation from five residents of Institute A and eight kitchen employees. The stools of all five residents and three of the employees were positive for the norovirus GII genome. Swabs of the kitchen were also taken for bacterial investigation, but gave negative results. The health center ordered Institute A to cease meal service and instructed the staff on the prevention of secondary infection.

On September 20, Institute C notified the health center of one of their members who became ill after visiting Institute B. The health center immediately ordered Institute C to take preventive measures against the spread of the infection, and initiated an investigation. The stool of one of two members of Institute C was found to be positive for norovirus GII.

The outbreak ended quickly, probably because all three institutions took prompt infection prevention measures including the restriction of external contact. On September 24, the last four patients involved in this outbreak developed symptoms; they were an employee of Institute A and three

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Table 1. Daily distribution of patients with acute gastroenteritis

Institute		September 15	16	17	18	19	20	21	22	23	24	25	Total
A	Resident		2	30	11	6	4	5					58
	Staff		7	5	5	4	2	1			1		25
	Contact										3		3
B	Resident	1	1	1	6	6	4	1					20
	Staff		1										1
C	User					1							1
Total		1	11	36	22	17	10	7	0	0	4	0	108

family members of residents of Institute A.

At total 108 individuals (for Institute A, 58 among 108 residents, 25 among 112 employees and 3 contacts; for the Institute B, 20 among 80 residents and 1 among 29 employees; for the Institute C, 1 in 23 users) developed symptoms. The number of patients whose stools were positive for norovirus GII was 20 in total (for the Institute A, 5 in 5 residents examined and 8 in 17 employees examined; for the Institute B, 5 in 6 residents examined and 1 in 6 employees examined; for the Institute C, 1 in 2 users examined). The daily distribution of patients with acute gastroenteritis is shown in Table 1.

The capsid region of the norovirus was amplified following the reverse transcription (RT)-PCR method reported by Kojima et al. (2) and sequenced. All the detected norovirus sequences were identical and were of genotype GII/4 (3).

Because there were a significant number of patients who had not eaten food served by any of the institutions in question, food-borne infection was excluded. The interchange of people among the institutions surely expanded the outbreak in this case.

In Yamanashi Prefecture, slightly before the present outbreak, there was an outbreak of norovirus GII in a nursing

home for the elderly. It is important to note that, in institutions where many people live together, there is a risk of norovirus outbreak even in non-epidemic seasons, and preventive measures should be taken as a matter of routine.

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