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Outbreak of Food-Borne Infection with Hepatitis A Virus

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Three cases of hepatitis A virus (HAV) infection were successively reported to the Niigata City Public Health and Sanitation Center (the Niigata City Public Health) by clinics in Niigata City, Japan on May 15 and 16, 2006. Another case of HAV infection was reported to the Niigata Prefectural Nagaoka Public Health Center on May 10, 2006. The Niigata City Public Health suspected a mass outbreak of food-borne infection, and started an investigation which revealed that all four patients had eaten at the same sushi bar in Niigata City between April 1 and 15, approximately 2 weeks before they experienced hepatitis symptoms (between May 2 and 4). The Niigata City Public Health suspected the sushi bar as a source of infection, and conducted a more detailed investigation.

Thirty-two foodhandlers of the sushi bar, 20 employees, 3 notification patients, and 42 contact persons were extracted, and detection of HAV was conducted at the Niigata City Institute of Public Health. The detection of HAV was performed by the real-time PCR method (light cycler; Roche, Tokyo, Japan) or the RT-PCR method according to the "Inspection Manual of National Institute of Infectious Diseases" and the "Inspection Method of the Hepatitis A Virus in Stool and Food (No. 081600 on August 16, 2002)". Genotyping of HAV was also carried out on the positive samples using a Gene Rapid sequencing system (Amersham Pharmacia, Tokyo, Japan).

The HAV gene was detected in the 3 patients reported to the Niigata City Public Health and in 1 employee (employee A, Table 1) who consulted a medical clinic with a cold early in April. Furthermore, the HAV gene was also detected in this employee's wife. Although she did not visit the sushi bar,

she did develop a fever with some cold late in April (Table 1). From the genetic analysis, the detected viruses were all IA type HAV, and the sequences of the VP1/2A domain were identical. In the BLAST search in DDBJ, the detected viruses had high homology with the Serpukhov-2001-101 (Ac. No. AY226610). None of the other samples taken from the foodhandlers and none of the foods themselves showed positivity for the HAV gene by the PCR method, and we were unable to determine what foods the affected individuals had eaten in common, since the incident went back more than a month and the patients could not remember everything they had eaten.

The Niigata City Public Health concluded that the sushi bar was the origin of the outbreak of the food-borne infection with HAV, and decided to close the bar from May 27 to 29. Moreover, in order to prevent expansion of the HAV infection, a telephone consultation system was conducted on May 27 and 28. There were more than 400 consultations, resulting in a diagnosis of hepatitis A in 5 additional individuals who had recently eaten at the sushi bar. After the telephone consultations, another 8 cases were also considered as hepatitis, however they were found not to be infected with HAV. Moreover, re-consultation and stool sample screening, etc. were recommended for 14 persons who were suspected of having hepatitis due to symptoms such as fever and fatigue.

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Table 1. Investigated data of the hepatitis A patients

	Patient A	Patient B	Patient C	Employee A	Employee A's wife	
Date of eating at sushi bar	April 15	April 3	April 1	unknown	not eating	
Date of shown hepatitis symptoms	May 3	May 4	May 2	a cold early in April	a cold with fever late in April	
RT-PCR						
1st PCR	positive	positive	positive	weak positive	positive	primer HAV+2799/-3273 (498bp)
Nested PCR	nt	nt	positive	positive	positive	primer HAV+2907/-3162 (280bp)
Real time PCR (copies)	1,090	1,580	15 ¹⁾	3 ¹⁾	66 ¹⁾	per RNA extraction liquid 5 μ l

¹⁾: out low range of standard curve.
nt, not tested.

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