

Laboratory and Epidemiology Communications

Outbreak of Hepatitis A Virus Infection Caused by Food Served in a Restaurant

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Communicated by Takaji Wakita

(Accepted March 19, 2007)

We report here an outbreak of hepatitis A virus (HAV) infection caused by food served in a restaurant under the jurisdiction of the N Health Center in Shiga Prefecture, Japan.

On September 3, 2006, the health center received a report from a hospital that six patients had been admitted with a diagnosis of acute hepatitis, and three of them were found to be infected with HAV. All six of the patients had dined at Restaurant K in M City on July 29. Furthermore, in 14 groups who dined in the same restaurant on July 29 and 30, five people in three groups developed the same symptoms. On July 30, Cook C in Restaurant K was admitted to the hospital with abdominal pain and was diagnosed with HAV infection.

The N Health Center concluded that the outbreak of HAV was caused by food served by the restaurant, given that all of

the patients in question had dined at Restaurant K during the period in which Cook C had the HAV infection.

Twenty-nine stool specimens obtained a total of 17 symptomatic patients (including the 11 patients [mentioned above]) implicated in this incident and 12 employees of the restaurant (excluding Cook C) were subjected to HAV detection by real-time polymerase chain reaction (PCR). Samples positive in the real-time PCR were subjected to reverse transcriptase (RT)-PCR for confirmation using a different primer set (1). The HAV genome was detected in the specimens of 12 patients but not in those of the others. A total of 20 serum specimens from the 17 symptomatic patients and three additional patients who developed acute hepatitis were examined by the Department of Virology 2, National Institute of Infectious Diseases, Japan, and 15 (including the 12 HAV genome-positive patients) were found to be positive for the HAV IgM antibody. All of the patients whose samples were negative for the HAV genome also tested negative on IgM tests.

Seven hundred twenty clients (62 groups) who dined in the

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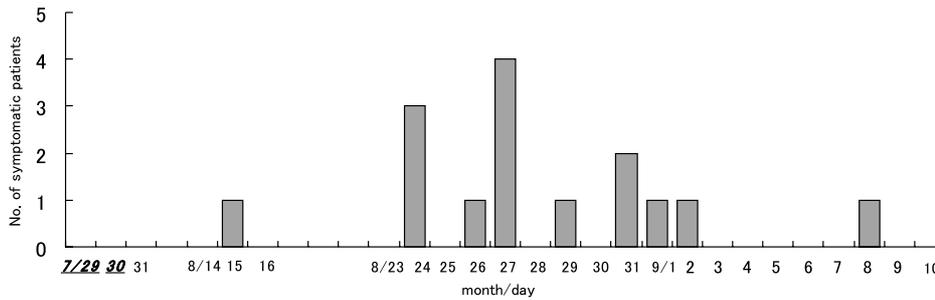


Fig. 1. Time course of appearance of symptomatic patients. Dates of ingestion HAV-contaminated food are underlined.

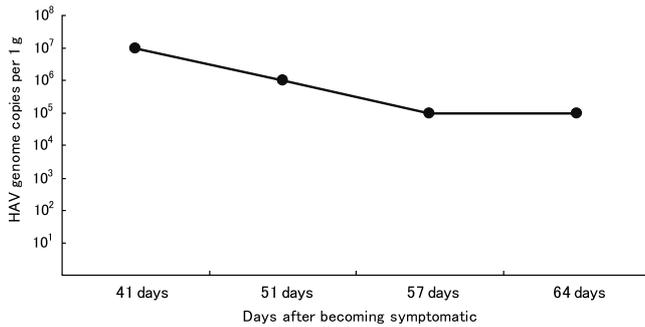


Fig. 2. Time course of HAV copy number in 1 g stool specimen of Cook C. Stool specimen is measured by the real-time PCR.

restaurant during the 2 weeks from July 20 to August 2, when Cook C fell ill and was admitted to the hospital were examined to determine their health status. The patients belonged only to groups who dined on July 29 and July 30. Of the 235 people who dined on these dates, 15 had HAV infection. Assuming that all 235 people ingested HAV-contaminated food, the attack rate was calculated to be 6.4%. The mean latent period was 29.3 days (Fig. 1).

A family member of Cook C also developed HAV hepatitis. Since the patient had not eaten in Restaurant K, a secondary

infection within the family was suspected.

The cook carried the HAV for at least 64 days after becoming symptomatic (Fig. 2). Fourteen specimens from 12 symptomatic patients, including Cook C and his family member, were used for direct sequencing of the HAV genome using the primer pair HAV+2799/HAV-3273. The seven specimens that yielded analyzable results showed an identical sequence belonging to genogroup (G) IA. A BLAST search in DDBJ (DNA Data Bank of Japan) revealed a close relationship to the HAV sequence with accession no. AB020567.

The route of infection to Cook C was unclear. The cook had no history of traveling abroad and could not remember ingesting any food that may have been infected.

We thank Dr Hiroshi Yoshikura, Emeritus Researcher of the National Institute of Infectious Diseases for advice on preparing the manuscript.

This article appeared in the *Infectious Agents Surveillance Report (IASR)*, vol. 27, p. 341-342, 2006 in Japanese.

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