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Food Poisoning Outbreak of *Salmonella* Enteritidis Caused by Box Lunch in Shiga Prefecture, Japan

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In October 2005, a large-scale food poisoning outbreak of *Salmonella* Enteritidis originated from a box lunch supplied by a caterer under the jurisdiction of the Shiga Prefecture Otsu Public Health Centers. This report discusses the outbreak.

On October 5, 2005, a clinic in Otsu notified the Otsu Health Center of a food poisoning outbreak. The health center's investigation revealed that 238 of 711 persons who had eaten a box lunch on October 2 prepared the same day by a caterer in Otsu showed gastroenteritis symptoms. The 711 persons fell into two categories: those who ate the whole box lunch and those who ate only a side dish in the box lunch).

The symptoms included diarrhea (227 patients), abdominal pains (186), fever (166) and headaches (81), followed by fatigue, chills, nausea, vomiting, and so on.

The incubation period was 4 - 246 h (mean 54 h). In 8 patients, the incubation period exceeded 100 h (Fig. 1).

To investigate the etiologic agent, a total of 74 samples were examined at the Shiga Prefectural Institute of Public Health: 29 swab specimens from the facilities and cooking tools of the caterer, 13 food ingredients and foods (remaining stock or lot food identical to that in the box lunch), 8 stool specimens from employees of the caterer, 22 stool specimens from symptomatic patients, and 2 from unsanitary insects (cockroach) found at the caterer's facilities. As a result, 21 strains of *S*. Enteritidis were isolated from 2 stool specimens from the employees, and 19 stool specimens from symptomatic patients. The positive samples included the stool of the symptomatic person who had the longest incubation period (246 h). The strain was isolated in the hospital, and serologic typing was carried out at our institute. However, *S*. Enteritidis was not detected from any swab specimens, from the food or

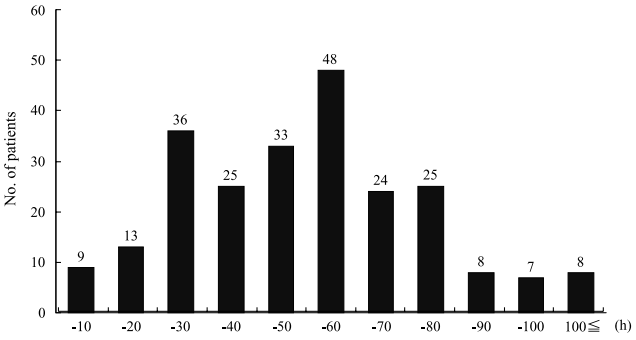

Fig. 1. Distribution of incubation period from patients.

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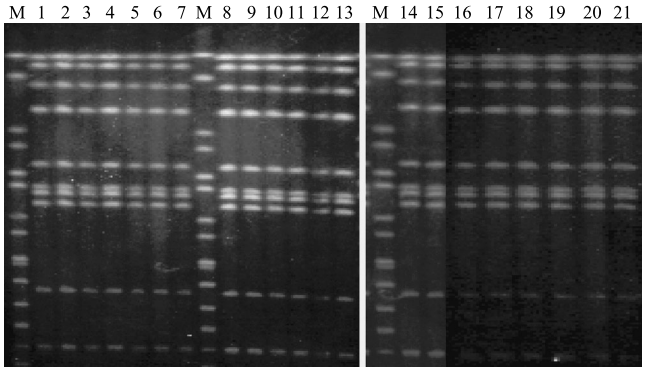

Fig. 2. PFGE patterns of *S*. Enteritidis digests with *Bln*I. Lanes 1 to 13 and 16 to 20, strains from patients. Lanes 14 and 21, starins from caterer employee. Lane 15, strain from patient (incubation period, 246 h). Lane M, DNA size maker (*S*. Braenderup H9812 digest with *Xba*I)

ingredients, or from the unsanitary insects.

To examine the epidemiological relatedness among the 21 isolated strains of *S*. Enteritidis, pulsed-field gel electrophoresis (PFGE) was carried out. The PFGE patterns of the *Bln*I digest were similar for all the isolates (Fig. 2). Besides, the 21 isolated strains all had an identical phage type (PT), PT47.

As the only common meal among the patients was the box lunch of October 2 and the situation of the crisis was the same among the patients, it was concluded that the cause of *Salmonella* food poisoning was the facility where the caterer had prepared the box lunch. However, we could not identify the contaminated sources, since *S*. Enteritidis was not detected from swab specimens or from the food or ingredients, and the 2 caterer employees who tested positive for *S*. Enteritidis had eaten the box lunch on the same day.

Although the average incubation period of *Salmonella* food poisoning is generally for 12 h, in this outbreak the period was dispersed; the mean incubation period was 54 h, and in some patients it exceeded 100 h. There were small quantities of fungus in the causative meals, and half of the symptomatic persons were children younger than 10 years old. Both of these seemed to be factors contributing to the long incubation periods.

Finally, *S*. Enteritidis was also isolated from the symptomatic person with the longest incubation period (246 h) in this outbreak. As a result of a retrospective investigation of dietary histories, this individual was judged to be one of the outbreak patients. However, this decision was difficult to make, because recently *S*. Enteritidis of PT47 had been the main isolate from sporadic patients in Shiga Prefecture. In addition, the PFGE patterns of these strains were high similar to each other (1).

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