

**Laboratory and Epidemiology Communications**

**A Foodborne Outbreak of Group A Streptococcal  
Infection in Fukuoka Prefecture, Japan**

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Communicated by Makoto Ohnishi

(Accepted April 8, 2014)

*Streptococcus pyogenes*, also known as group A *Streptococcus* (GAS), is a gram-positive bacterium often found in human throat and skin. GAS causes several human diseases, including pharyngitis, tonsillitis, impetigo, scarlet fever, and streptococcal toxic shock-like syndrome (1). Foodborne disease caused by GAS is rare (2), but some foodborne outbreaks have been reported in Japan (3–13) (Table 1). The suspected sources of infection for these outbreaks were varied, but egg was often implicated as a vehicle (e.g., egg sandwich [4,7] and Japanese omelet in boxed lunches [5,6]).

Here we describe the second foodborne outbreak of GAS since 1997 in Fukuoka Prefecture, Japan. The outbreak involved 27 attendees of a meeting held in July 2013. Several types of sandwich for lunch were obtained from a shop near the meeting venue; these included egg with mayonnaise, tuna with mayonnaise, as well as ham and chicken. Of the 26 individuals who consumed the

sandwiches, 20 (76.9%) developed symptoms within 13–41 h after consumption, including sore throat (100%), fever of 37.2–40.5°C (95%), chill (60%), nausea (25%), diarrhea (20%), and stomach ache (10%). Furthermore, all the individuals who became sick had eaten the sandwiches.

GAS was isolated from the pharyngeal washings obtained from the patients and from a food handler at the shop from which the sandwiches were procured, using sheep blood media (Nissui Pharmaceutical, Tokyo, Japan). T serotyping using anti-GAS antibodies (Denka Seiken, Tokyo, Japan) showed that all the isolates were of T-B3264 serotype. Pulsed-field gel electrophoresis patterns of the GAS isolates obtained from the patients and the food handler were identical (Fig. 1); the restriction enzyme *SmaI* was used for DNA digestion (Takara Bio, Shiga, Japan). Furthermore, M protein gene (*emm*) typing revealed that all the GAS isolates obtained from the patients and the food handler were of *emm89* type (14,15), suggesting that this outbreak was caused by GAS-contaminated sandwiches, although the same batch of sandwiches could not be tested. Surveillance information on GAS isolates obtained from nasopharyngeal specimens in Kyushu area, including Fukuoka Prefecture, revealed that GAS T-B3264 accounted for

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Table 1. Documented outbreaks of foodborne group A streptococcal infection in Japan

| Date           | Suspected source | District | No. of patients | Symptom            | T-type  | M-type        |
|----------------|------------------|----------|-----------------|--------------------|---------|---------------|
| July 1969      | Noodle           | Saitama  | 69              | Pharyngitis, fever | T-12    | —             |
| July 1983      | Sandwich         | Tokyo    | 583             | Pharyngitis, fever | T-13    | —             |
| May 1996       | Boxed lunch      | Aichi    | 244             | Pharyngitis, fever | T-1     | <i>emm1</i>   |
| May 1997       | Boxed lunch      | Fukuoka  | 943             | Pharyngitis, fever | T-B3264 | <i>emm104</i> |
| August 1998    | Boxed lunch      | Ibaraki  | 342             | Pharyngitis, fever | T-22    | <i>emm22</i>  |
| September 1998 | Sandwich         | Kumamoto | 254             | Pharyngitis, fever | T-28    | <i>emm28</i>  |
| September 2003 | Boxed lunch      | Chiba    | 67              | Pharyngitis, fever | T-B3264 | <i>emm68</i>  |
| July 2005      | Boxed lunch      | Kanagawa | 116             | Pharyngitis, fever | T-25    | —             |
| August 2012    | Rice ball        | Ehime    | 46              | Pharyngitis, fever | T-B3264 | <i>emm89</i>  |
| June 2013      | Boxed lunch      | Gifu     | 143             | Pharyngitis, fever | T-B3264 | —             |

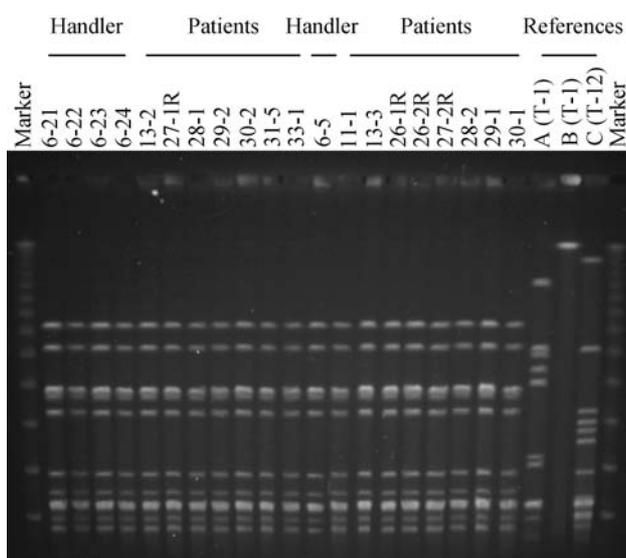


Fig. 1. Pulsed-field gel electrophoresis analysis of *SmaI*-digested GAS isolated from a food handler and patients in the present outbreak. Lambda Ladder PFG Marker was purchased from New England BioLabs (Ipswich, MA, USA).

11.3% (47/415) of all GAS isolates and was not the dominant serotype during 2011–2012 (unpublished results). The current data reveals that at least a fraction of GAS infections can be transmitted via food items. Although it is difficult to distinguish foodborne transmission from respiratory transmission in a clustered group of GAS pharyngitis patients, the possibility of GAS transmission through contaminated foods should be considered, as suggested (Table 1).

**Acknowledgments** This work was partially supported by grants-in-aid from the Ministry of Health, Labour and Welfare of Japan (H24-Shinko-Ippan-005).

We thank Dr. T. Hirata, Dr. K. Chijiwa, and Dr. K. Horikawa, Fukuoka Institute of Health and Environmental Sciences, for invaluable advice.

**Conflict of interest** None to declare.

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