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Group A β -hemolytic streptococcal pharyngotonsillitis outbreak

ABSTRACT

The aim was to describe an outbreak of group A β -hemolytic streptococcal pharyngotonsillitis in health care professionals. This is a cross-sectional descriptive study of 17 clients who dined at the same table in a restaurant in Barcelona in July 2012. The frequency, timing and severity of symptoms were analyzed, as were demographic variables and others concerning the food ingested. The attack rate was 58.8%. Six of the 10 clients were positive for group A β -hemolytic streptococcal. Six of the 13 individuals who handled the food involved in the dinner had symptoms. No association was identified with the food consumed. There is epidemiological evidence of foodborne group A β -hemolytic streptococcal transmission, but respiratory transmission could not be ruled out.

DESCRIPTORS: Streptococcal Infections, epidemiology. Tonsillitis. Pharyngitis. Food Contamination. Disease Outbreaks.

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INTRODUCTION

B-hemolytic streptococci are Gram (+) microorganisms which form part of humans' respiratory and digestive flora.⁴ Group A β -hemolytic streptococcal pharyngotonsillitis (GABHS) is more common in childhood and is usually transmitted by direct contact with nasal secretions or saliva.⁴ Although less common, epidemics due to food- or water-based transmission have also been documented.⁴ Most GABHS outbreaks in which person-person transmission has been verified occur in health centers for older adults.⁵

The majority of food poisoning outbreaks caused by GABHS are related to food contaminated at origin or by food handlers who are ill or carriers of respiratory infections or of skin infections on the hands.¹ There have also been reports of outbreaks in military bases, industrial plants,² restaurants, prisons¹ and at family get-togethers.²

GABHS infections are of great significance to public health.

This study aimed to describe an outbreak of pharyngotonsillitis in a group of diners at a restaurant in Barcelona, Spain.

METHODS

This was a descriptive cross-sectional study of a pharyngotonsillitis outbreak affecting 17 individuals dining together in a restaurant in Barcelona, Spain, on July 13, 2012 and notified to the Barcelona Public Health Agency on July 17 of the same year.

Of the 17 diners, 16 were health care professionals (doctors, nurses, psychologists, medical residents and other workers), as well as a three-year old girl who was also present. The clinical presentation was of abrupt onset characterized by pultaceous tonsillitis, fever, severe odynophagia and general illness. These symptoms were also present in six of the 13 food handlers who prepared and served the meal. On the July 11 (two days before the outbreak) the head chef fell ill and did not work on the day of the dinner, presenting the same symptoms as the others affected. No patients with respiratory symptoms were identified among those with whom the health care professionals had had contact.

A case was marked suspect if the patient had participated in the dinner or as a food handler on preceding days or during the dinner on July 13 in the restaurant involved and presented signs of pharyngotonsillitis. Probable cases are suspect cases with pultaceous tonsillitis, fever, severe odynophagia and/or general illness, but not confirmed by bacteriological studies. Confirmed cases were constituted by the groups of those affected presenting clinical signs before exposure, and with GABHS confirmed by bacteriological studies. For purposes of seeking cases and to declare the infectious period, the incubation period was deemed to be the time between one hour after the dinner and the fourth day after.

The frequency, time and severity of symptoms in those affected were analyzed, as were demographic variables (mean age, sex or profession), food consumed and history of contact with sick individuals (including patients of the health care professionals affected), among other

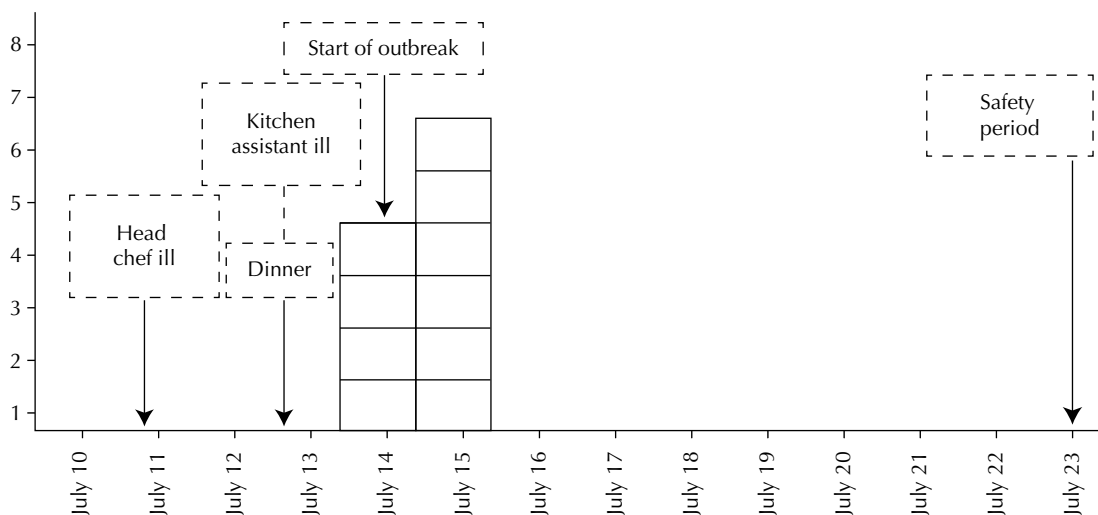


Figure. Distribution of cases according to the date of onset of symptoms in an outbreak of pultaceous group A β -hemolytic streptococcal pharyngotonsillitis (GABHS) affecting a group of diners in a restaurant. Barcelona, Spain, July 2012.

factors. The dependent variable was having the disease (case) and the independent variable was consumption of each dish, in order to perform statistical analysis of the results. The attack rate was calculated and associations evaluated using the Chi-square test, with $p < 0.05$ as the level of significance, using the SPSS 18.0 statistical program.

The restaurant was inspected, verifying the generic hazard control plans: controlling water and temperature, suppliers, pests, hygiene, allergens, food handler training and maintenance, among others.

Samples of nasal and pharyngeal swabs were taken from the food handlers ($n = 13$) and the patients affected ($n = 10$). Cultures in blood agar and blood agar nalidixic acid and colistin. Colonies were identified using β -hemolysis and metabolism tests and through determining group A by Lancefield latex grouping. No studies of antibiotic sensitivity were conducted on the isolated strains, as *Streptococcus pyogenes* is highly sensitive to penicillin.

All confirmed cases were given antibiotics and an active search for cases was conducted as well as education on GABHS being given to those affected and to the food handlers as a control measure.

All criteria of the Declaration of Helsinki were met throughout the investigation. All participants gave their informed consent.

RESULTS

Ten of the 17 diners fell ill, with an attack rate of 58.8% and mean age of 33 (three to 48) years old. Nine were female. No contacts (relatives, friends, patients) related to the diners were identified as having respiratory disease, nor were there secondary cases in their environment.

The diners' symptoms began between the July 14 and 15, with four and six cases, respectively, with an average incubation period of 30.4 (four to 45) hours. The safety period for considering the outbreak over was set as the July 23, equivalent to two times the incubation period (eight days after the last case was reported) (Figure).

Ten of the 17 suspected cases were classified as probable and, of these, seven had pultaceous tonsillitis, eight had a fever $> 38^{\circ}\text{C}$, all had severe (very painful) odynophagia. GABHS was identified through bacteriological studies, in six of the 10 suspected cases, five being adults and one a minor (the three year old girl). The latter had previously shown symptoms of otitis and was finishing a course of amoxicillin on the day of the dinner.

Of the 13 food handlers studied, six had symptoms related to pultaceous pharyngotonsillitis. One had symptoms the day before the dinner (the head chef), another during

the dinner (assistant) and four later: A waiter had symptoms of fever and odynophagia, the worker in charge of preparing salads had odynophagia and another two workers had respiratory symptoms.

At the time of taking the samples, all symptomatic food handlers had been treated with amoxicillin or macrolides. However, on the day of the meal, none of them had taken antibiotics. Seven of the 13 food handlers tested negative, including the head chef and the principal assistant.

The server with symptoms on the night of the dinner not only handled the dessert (tiramisu) and served it to a table at room temperature but also served other dishes without using a mask during his activities. No samples of the food could be taken as there were none available. The four dishes most consumed by those affected were salad (62.5%; $p = 0.811$), *paella* (62.5%; $p = 0.811$), *calamares a la romana* (62.5%; $p = 0.811$) and *tiramisu* (62.5%; $p = 0.811$). No statistical association was found between the dishes and the variables analyzed.

DISCUSSION

There is epidemiological evidence of food based transmission of GABHS, without being able to rule out airborne transmission.

Epidemic outbreaks of GABHS transmitted via food are not common.^{3,4} Respiratory transmission with such a short incubation period (all cases within 48 hours) such a high attack rate and such an abrupt clinical presentation and evident epidemiological connection between cases (60.0% of diners affected showed GABHS) is, from an epidemiological point of view, uncommon. Added to this, one of the food handlers was ill during the meal and had the same symptoms as the diners. Although there were no significant differences between the different dishes consumed, it could be supposed that they probably acted as the vehicle of transmission for the infection. Dishes such as salad and those containing eggs,³ such as tiramisù, have a high possibility of participating in the transmission of GABHS. The tiramisù was exposed to room temperature (in July, European summer) and to heat in the kitchen, which may have facilitated the transmission of GABHS.

There were limitations to the investigation, such as the lack of samples of the dishes served and consumed at the dinner and in no streptococci being detected in the cultures of samples taken from the food handlers, as they started taking antibiotics before the cultures were performed. For such reasons, we cannot rule out respiratory (person to person) transmission, especially as there was a child finishing treatment for otitis among the diners. It would have been useful to have conducted

analysis of samples using molecular techniques to determine GABHS in food handlers, the child and other affected individuals.

This outbreak was detected in time due to those affected being health care workers, contributing to notification of the disease and to rapid intervention.

Despite the study's limitations, we consider it important to communicate the results, which may be useful to the medical community as it considers the possibility

of food based transmission and may aid in characterizing this type of outbreak.

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The authors declare that there is no conflict of interest.