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An Acute Self-Limited Gastrointestinal Illness at a Company Picnic

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야유회에서 발생한 食中毒에 관한 調査

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ABSTRACT—On May 23, 1990, an acute self-limited gastrointestinal illness was reported by twenty-seven persons. They were some of the employees and family members who attended a company open house picnic in Bergen County, New Jersey.

Food questionnaires implicated that ziti was the vehicle of transmission (chi square 9.05). Median incubation period was 9.0 hours, and the median duration of illness 24 hours *Clostridium perfringens* organisms and enterotoxin were isolated from stool samples.

Keywords□Gastrointestinal illness, *clostridium perfringens*, Enterotoxin

On May 23, 1990, plant manager of a company informed the Bergen County Health Department that a few people who atended the open house picnic on May 19, 1990 developed symptoms of gastroenteritis. Immediately following the reception of this information, an epidemiological investigation was initiated. On Saturday, May 19, 1990, a company held an open house picnic for employees and their families at the company in Bergen County, New Jersey.

Between 900 and 1,000 people, including relatives and friends of employees, attended the picnic. A delicatessen catered the food for the picnic. The catered foods included meatballs, chicken, ziti, sandwiches, and salad.

The foods were prepared around 9 : 00 a.m. at the caterer's and brought to the picnic around 8 : 00 a.m. to be served starting 9 : 00 a.m.

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METHODS

Epidemiologic Investigation

Case definition—A case was defined as an individual with stomach cramps and diarrhea occurring within 24 hours of the picnic.

Asertainment and Selection of Controls: On Thursday, May 24, 1990, thiry-four (34) employees (16 sick and 18 healthy persons) were interviewed at the Plant and seventeen (17) family members (11 sick and 6 healthy people) who had attended the party were interviewed over the telephone on Friday, May 25, and Monday, May 28, 1990.

Survey—The following information was sought by interview: Age, sex, symptoms of illness, duration and onset of illness and food history.[1)]

Attendees of the picnic who were not ill (control) were also interviewed and their age, sex and food history were tabulated.[2,3)]

Analysis—Odd ratios were calculated and statistical significance was tested using the Fisher

Table 1. Symptoms Reported Cases

Symptoms	No.of Cases	(% of Cases Reporting Each Sympton)
Diarrhea	27	100.0
Abdominal pain	22	81.5
Nausea	7	26.9
Headache	5	18.5
Chills	2	7.4
Vomiting	2	7.4

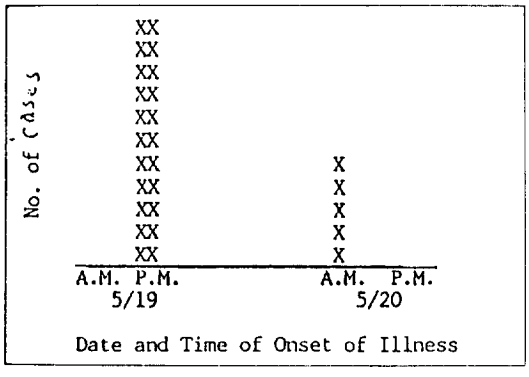

Fig. 1. The Time of Oneset of Illness

exact test or chi square test as indicated. $P<0.05$ was considered significant.

Microbiological Test—Stool specimens were collected and cultured for *clostridium perfringens* at the State Health Department of New Jersey.

Environmental Health Evaluation—Environmental health of the catering place was evaluated by Health Department.[4]

RESULTS

Case characteristics—A total of 51 people were interviewed and 27 people met the case definition. The median age of cases was 45 years old with a range of 1 to 60 years.

Among the people not meeting the case definition, the median age was 48 years old with a range of 16 to 62 years.

Diarrhea and abdominal pains were the most common symptoms reported. The symptoms reported by the cases are listed in Table 1. The median onset time was 9 hours. The time of onset

Table 2. Food Specific Attack Rates Among Persons Attending Company Open House Picnic

Persons Who Ate Specified Food

Food	Ill	Not ill	Total	Attack rate(%)
Ziti	24	11	35	68.6
Meatball	19	14	33	57.6
Sausage	16	19	35	45.7
Chicken Parmesan	18	13	31	58.0

Persons Who Didn't Eat Specified Food

Food	Ill	Not ill	Total	Attack rate(%)
Ziti	3	13	16	18.7
Meatball	8	10	18	44.4
Sausage	11	5	16	68.7
Chicken Parmesan	9	11	20	45.0

is shown in Figure 1. In persons meeting the case definition, the illness was reported to last from 3 to 72 hours with a median 8 to 24 hours.

Food History—Food specific attack rates were collected for the following foods: Ham, turkey, roast beef, pepperoni, potato salad, cole slaw, ziti, meatballs, sausage, chicken parmesan and hot dogs. Of these, ziti, meatballs, sausage and chicken parmesan had elevated attack rates, (Table 2). Ziti was the most suspected food causing illness among the picnic attendees, (chi square is 9.03) and it is highly significant statistically.

Microbiological Test—Sixteen stool samples were collected from the ill people, and twelve samples were positive for *clostridium perfringens* with entrotoxin.

Discussion—In this outbreak, the epidemic curve suggests a common source. The incubation period, the clinical symptoms and the duraion of symptoms are compatible with *clostridium perfringens* food poisoning. 1) The bacteriological findings-isolation of *clostridium perfringens* with enterotoxin from stools-provide supporting evidence of this conclusion.

The vehicle of this outbreak was traced to ziti, which was prepared early morning at 2 : 00 a.m. on 19 day and put into the refrigerator until brought to the picnic site. Neither meat nor chicken

were involved in ziti. It is assumed that ziti was cross-contaminated with the bacteria while it was prepared, and the bacteria (*clostridium perfringens)* multiplied and produced toxin during cooling process. Sanitary evaluation report revealed that the food prepation area is not big enough for sanitary handing of foods. Most outbreaks are associated with inadequately heated or reheated meats; usually stews, meat pies, or gravies made of beef, turkey or chicken.[5] This outbreak was traced to ziti, which is a kind of macaroni dish with cheese and tomato sauce.

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국문요약

1990년 5월 23일, 27列의 食中毒이 보고되었다. 그들은 美國 New Jersey州의 Bergen Country에 있는 한 회사의 개업기념 야유회에 참석한 직원과 가족들 중 일부였다. 섭취한 음식에 대한 설문조사로 ziti가 전파매체였던 것으로 생각되었다(Chi Square 9.05). 잠복기는 9시간, 증세 지속시간은 평균 24시간이었다. 대변 검사결과 *Clostridium perfringens*와 엔테로톡신이 분리되었다.

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