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Norwalk-like Virus Strikes Anchorage Workers

On November 10, 1999, staff from Company A in Anchorage called the Section of Epidemiology to report unusually high absenteeism. Employees had acute gastrointestinal symptoms and there was speculation that about 20% of approximately 500 employees were out sick.

Restaurant B had catered a luncheon at Company A on November 8. About 450 plates of food were served, but the luncheon was in a public area and non-employees may have eaten. The plate count also did not account for second helpings served on new plates.

Investigation - On November 11, staff from the Anchorage Department of Health and Human Services and the Section of Epidemiology prepared a questionnaire that was sent by e-mail to all Company A employees in the building where the luncheon had been held. Within 2-3 hours, 247 questionnaires were returned. By November 15, 456 questionnaires were returned and approximately 40 ill persons were contacted by telephone or in person. The case definition was any Company A employee who ate food served at the November 8 luncheon and had onset of nausea, vomiting, or diarrhea 1-72 hours later. Stool samples and throat swabs were collected from ill persons. Sanitarians from the Municipality inspected Restaurant B. Potentially contaminated leftover foods were removed from the restaurant and submitted for testing.

Results - The attack rate among Company A employees who had attended the luncheon was significantly higher than among those who had not (Table 1). Fifty-six percent (n=191) of 343 employees who ate luncheon food and completed a questionnaire were ill. The median incubation period was 33 hours and the duration of symptoms ranged from 4-96 hours.

	Ill	Not ill	Attack rate
Attended luncheon	191	152	55.7%
Did not attend	4	76	5.0%

Odds ratio = 23.9 (95% confidence interval 8.6, 91.4), $p < 10^{-6}$

*Thirty-three persons were not included because they were not in the building on November 8.

Anecdotally, three persons were hospitalized and approximately a dozen others visited emergency rooms. These reports, as well as several reports of secondary transmission to household members, have not been confirmed by the Section of Epidemiology.

Consumption of potato salad was strongly associated with illness: of 236 persons who ate potato salad, 183 became ill (Table 2). Cornbread was the only other food item associated with illness; this association disappeared after stratifying on potato salad.

The potato salad was made at Restaurant B by two food preparers. One was ill with gastrointestinal symptoms at the time the salad was made - this person reportedly mixed the ingredients by hand. Since restaurant B did not have the permit required for off-site catering, enforcement action was initiated by the Municipality. Preliminary results of follow-up of Restaurant B patrons who paid by credit card during November 8-11 suggests that some became ill after eating potato salad.

Laboratory results - Fifteen stool samples were sent to the US Centers for Disease Control and Prevention. Ten were from ill luncheon attendees, three were from food handlers at Restaurant B (including one ill food handler), and two were from Restaurant B patrons who ate potato salad and became ill. Preliminary results from direct electron microscopy of stools from five ill luncheon attendees revealed small round structured virus, which is consistent with Norwalk-like virus. Confirmatory test results are expected in early December. Several stool samples were negative for *Shigella*, *Salmonella*, and *Campylobacter* at the State Public Health Laboratory. Results for throat swabs and stool samples submitted to the State Virology Laboratory for enterovirus testing are pending.

Potato salad leftover from the batch served at the luncheon was tested at the Department of Environmental Conservation Laboratory in Palmer. *Shigella*, *Salmonella*, and fecal coliforms were not isolated. Results for *Listeria* and *Staphylococci* are pending. Results from tests for Norwalk-like virus, conducted at North Carolina State University Food Science Laboratory, are expected in early December.

Discussion - Norwalk-like viruses have been implicated in a third of the nonbacterial gastroenteritis outbreaks in the United States. Symptoms typically include nausea, vomiting, diarrhea, abdominal pain, myalgia, headache, low-grade fever, and malaise. Illness is usually self-limited and lasts 24-48 hours. Norwalk-like viruses are spread via the fecal-oral route, although airborne or fomite transmission may contribute to rapid spread in confined populations. Because the infectious dose is extremely low, the attack rate in common source outbreaks can be high and secondary transmission to family members is common.

Testing for Norwalk-like viruses in stool specimens is complicated by the fact that these viruses cannot be cultivated *in vitro*. Testing depends on electron microscopy and molecular probes, tests which are not widely available. A few specialized research laboratories can detect virus in food but testing is indicated only when an investigation implicates a particular food item.

Conclusion and Recommendations -

1. This was a common source outbreak of Norwalk-like viral gastroenteritis. The investigation implicated potato salad made by an ill food handler. The outbreak reinforces the need for public health inspections and oversight of food service establishments.

2. Frequent and thorough hand-washing will prevent or reduce transmission of enteric diseases. Commercial food handlers should always wash their hands after using the bathroom and should not handle food if they have gastrointestinal symptoms.

	Ill	Not ill	Attack rate
Ate potato salad	183	53	77.5%
Did not eat potato salad	8	99	7.5%

Odds ratio = 42.7 (95% confidence interval 18.6, 101.7), $p < 10^{-6}$

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