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An Outbreak of Gastroenteritis of Unknown Origin in Tehran, July 2003

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Abstract: Aim of this study was to determine the causative agent and source of a large gastroenteritis outbreak occurred in a national financial center (CBIRI) in July 2003. A patient definition was defined staff were interviewed in the clinic of the Bank and their information were collected by means of a standardized questionnaire. A total of 110 fecal specimens were collected within 48 h of symptom onset from 100 patients with symptoms of gastroenteritis and 10 restaurant staff. The specimens were processed within 12 h to detect ova and parasites by direct microscopy and common bacteria by standard methods. The outbreak started on 22 July 2003 lasted 4 days. From a total of 1300 staff. 535 persons experienced a severe gastrointestinal illness. None but one of tested fecal samples were positive for bacterial enteric pathogens. *S. paratyphi B* was isolated from the positive case. Definitive association between illness and isolated *S. paratyphi B* remained to be determined since it was isolated only from one case. There is a need, however, for increased awareness among both professionals and the public to implement appropriate prevention measures and monitoring of food and water.

Key words: Gastroenteritis, outbreak, Tehran

INTRODUCTION

In 22 July 2003, the physician of clinic of the CBIRI reported a large outbreak of gastroenteritis in the CBIRI. The Building of CBIRI is located in north of Tehran, capital of Iran and has approximately 1300 staff.

This study was therefore undertaken to determine the causative agent and the source of a gastroenteritis outbreak in the building of the CBIRI in the period from 22 through 25 July 2003.

MATERIALS AND METHODS

Outbreak occurred from 22 to 25 July 2003 in the CBIRI. To find the suspected cases of the gastroenteritis, we defined a case patient of disease with diarrhea three or more times in a 24 h period or bloody diarrhea or vomiting (at least one episode). Fever greater than or equal to 38°C and abdominal pain were considered additional symptoms. Respondents were excluded if they considered their symptoms to be due to non-infectious causes of diarrhea or vomiting such as ulcerative colitis, pregnancy, menstruation, or medication known to cause vomiting (e.g., chemotherapy). We interviewed staff and collected their information by means of a standardized questionnaire, included questions about gender, type of food consumed during the last 72 h before onset of symptoms; if ill, type, date and time of onset of symptoms.

From 22 through 25 July 2003, a total of 110 fecal specimens were collected within 48 h of symptom onset from 100 patients with symptoms of gastroenteritis and 10 restaurant staff. The specimens were processed within 12 h to detect ova and parasites by direct microscopy and common bacteria by the standard microbiological methods (Ewing, 1986).

The cultures were directed to detect *Salmonella*, *Shigella*, *Yersinia*, *Campilobacter* and *Listeria*. Food and water samples obtained from restaurant were also analyzed during the outbreak. Antimicrobial susceptibility test was performed according to the standard CLSI guideline (Clinical and Laboratory Standards Institute, 2005).

RESULTS

From a total of 1300 staff of the CBIRI, 535 persons experienced a severe gastrointestinal illness. Of these, 283 (53%) were female and 252 (47%) were male. The

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Table 1: Number of patients with gastroenteritis by onset date

	Date (days) (July 2003)			
No. of cases	22	23	24	25
Female	56	200	25	2
Male	51	170	27	4
Total	107	370	52	6

The clinical pattern of the disease was characterized by the presence of diarrhea (95%), abdominal pain (86%), fever (76%) and vomiting (10%). The outbreak started on 22 July 2003 lasted 4 days. The epidemic curve shows a single peak with 370 cases on 23 July (Table 1). None of food and water samples taken during the outbreak from CBIRI restaurant was positive in microbiological analysis. None but one of tested fecal samples were positive for bacterial enteric pathogens. *Salmonella* was isolated from the positive case. By slid agglutination using specific antiserum (BioMerieux), the isolate was identyfied as *S. paratyphi B*. This isolate was sensitive to Amikacin, Cefotaxim, Ciprofloxacin, Gentamycin and was resistant to Ampicillin, Chloramphenicol, Co-trimoxazole, Kanamycin, Nalidixic acid, Nitrourantoin and Tetracyclin. No deaths occurred among the patient cases. Since clinical signs and symptoms were consistent with classical bacterial gastroenteritis, isolation procedures were not directed for viral diagnosis.

DISCUSSION

Enteric infections comprise the second commonest medical problem after respiratory infectious disease (Ranjbar *et al*., 2004) Acute gastroenteritis is a common and important public health problem with significant economic cost. There are several causes of gastroenteritis, most of which infective (virus, bacterium, parasite). Bacterial gastroenteritis is frequently a result of poor sanitation, the lack of safe drinking water, or contaminated food conditions common in developing nations. Common types of bacterial gastroenteritis can be linked to *Salmonella* and *Campylobacter* bacteria. Salmonella infections cause an estimated 1.4 million human illnesses and 400 deaths annually in the United States (CDC, 2006; Mead *et al*., 1999).

There have been several reports of large outbreaks of gastroenteritis caused by *Salmonella*. A large community outbreak of *S. typhimurium* infections occurred in September and October 1984 in Dalles, Oregon. A total of 751 persons with *Salmonella* gastroenteritis associated with eating or working at area restaurants. This outbreak was caused by intentional contamination of restaurant salad bars by members of a religious commune (Torok *et al*., 1997). Other large outbreak due to food poisoning occurred in September 1996 and involved at least 116 workers at a shipyard in Jurong. *S. weltevreden* was isolated from the stool specimens of 24 hospitalized cases and three food handlers. Extensive investigation suggested that contamination may have occurred through unauthorized use of industrial water for washing the fresh produce (Ooi *et al*., 1997).

Taylor *et al*. (2000) investigated outbreak contamination of a tank water supply system that led to an infection of *S. Saintpaul* with 28 cases of gastroenteritis amongst over 200 workers at a large construction site in March 1999 in central Queensland, Australia. The source of infection was identified as contaminated drinking water through environmental sampling and confirmed by epidemiological investigations. In the another study, Camps *et al*. (2005) investigated a large outbreak of gastroenteritis that occurred in Catalonia, Spain in June 2002 with 1435 cases and 117 hospitalizations. Consumption of a hard pastry with vanilla cream was strongly associated with illness. *S. enteriditis* was identified as causative agent (Camps *et al*., 2005).

We could not determine definitive association between illness and isolated *S. paratyphi B* since it was isolated only from one case. However, since clinical signs and symptoms were consistent with classical bacterial gastroenteritis, isolation procedures were not directed for viral detection. The origin of outbreak was to be unknown since we could not isolate the causative agent from food, water and fecal specimens taken from restaurant staff.

There is a need for increased awareness among both professionals and the public regarding the appropriate monitoring of food and water. Surveillance for human *Salmonella* infections plays a critical role in understanding and controlling foodborne illness due to *Salmonella* (Swaminathan *et al*., 2006).

Measures to prevent acute gastroenteritis are simple. By implementing simple measures like proper hand washing and following the rules of safe food preparation, the burden of illness can be reduced.

REFERENCES

Camps, N., A. Dominguez, M. Company, M. Perez, J. Pardos, T. Llobet, M.A. Usera, L. Salleras, 2005. Working Group for the Investigation of the Outbreak of Salmonellosis in Torroella de Montgri. A foodborne outbreak of *Salmonella* infection due to overproduction of egg-containing foods for a festival. Epidemiol. Infect., 133: 817-822.

Centers for Disease Control and Prevention (CDC), 2006. Multistate outbreak of Salmonella typhimurium infections associated with eating ground beef-United States, 2004. MMWR. Morb. Mortal. Wkly Rep., 55: 180-182.

Clinical and Laboratory Standards Institute, 2005. Performance standards for antimicrobial susceptibility testing; fifteenth informational supplement. Approved standard M100-S15. Clinical and Laboratory Standards Institute, Wayne, Pa.

Ewing, W.H., 1986. Edwards and Ewing's identification of *Enterobacteriaceae*, Elsevier Science Publishing Co. New York, pp: 169-181.

Mead, P.S., L. Slutsker, V. Dietz, L.F. McCaig, J.S. Bresee, C. Shapiro, P.M. Griffin and R.V. Tauxe, 1999. Food-related illness and death in the United States. Emerg. Infect. Dis., 5: 607-625.

Ooi, P.L., K.T. Goh, K.S. Neo and C.C. Ngan, 1997. A shipyard outbreak of salmonellosis traced to contaminated fruits and vegetables. Ann. Acad. Med. Singapore, 26: 539-543.

Ranjbar, R., M.M. Soltan Dallal, M.R. Poursha Fie, M.M. Aslani, R. Majdzadeh and M.R. Khorramizadeh, 2004. Serogroup distribution of Shigella in Tehran. Iran J. Publ. Health, 33: 32-35.

Swaminathan, B., T.J. Barrett and P. Fields, 2006. Surveillance for human Salmonella infections in the United States. J. AOAC. Int., 89: 553-559.

Taylor, R., D. Sloan, T. Cooper, B. Morton and I. Hunter, 2000. A waterborne outbreak of *Salmonella Saintpaul*. Commun. Dis. Intell., 24: 336-340.

Torok, T.J., R.V. Tauxe, R.P. Wise, J.R. Livengood, R. Sokolow, S. Mauvais, K.A. Birkness, M.R. Skeels, J.M. Horan and L.R. Foster, 1997. A large community outbreak of salmonellosis caused by intentional contamination of restaurant salad bars. JAMA., 278: 389-395.