Original Article

An Outbreak of Shigellosis due to *Shigella flexneri* Serotype 3a in a Prison in Iran

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Abstract

Background: On June 16 and 17, 2007, the medical clinic of a prison in Isfahan, Iran received multiple reports of gastrointestinal illness among prisoners. A cross-sectional study was therefore undertaken to determine the extent, causative agent and possible source of the outbreak.

Methods: A case-patient was defined and patient information was collected with a standardized questionnaire. Stool samples were collected from the patients and restaurant employees, and analyzed for the presence of enteric bacteria by routine bacteriological methods. *Shigella* isolates were identified and serotyped by commercially available antisera. The relationship between the strains was determined using antimicrobial drug resistance pattern analysis and enterobacterial repetitive intergenic consensus polymerase chain reaction (ERIC-PCR).

Results: Seven hundred one inmates experienced gastrointestinal illness and severe diarrhea. The attack rate was 14.02%. Rectal swabs and stool cultures recovered from patients tested positive for *Shigella flexneri* serotype 3a. All tested isolates had a similar antibiotic resistance and ERIC-PCR pattern. Our findings demonstrated that raw vegetables were more likely to be the causative agent of this outbreak.

Conclusion: The results indicated that a single clone of *S. flexneri* was responsible for this outbreak. Although we could not trace the exact origin of the organism, the consumption of raw vegetables one day prior to the onset of illness was strongly associated with an increased risk of *S. flexneri* infection. This study emphasizes the need for accurate monitoring and surveillance of food and vegetables consumed in prisons.

Keywords: outbreak, prisoners, *Shigella flexneri*, Shigellosis

Introduction

Infections caused by *Shigella* species remain a major cause of diarrheal disease in developing countries such as Iran.[1–3] The *Shigella* species is readily spread by person-to-person transmission via the oral-fecal route; however, contaminated water, food and vegetables have also been implicated as vehicles of transmission.[4] Many foodborne and waterborne outbreaks of shigellosis have been reported. Some studies have shown that the ingestion of raw or fresh vegetables is an effective and potential source of infection caused by *Shigella* organisms.[5,6]

On June16 and 17, 2007, the medical clinic of a prison in Isfahan, Iran received multiple reports of gastrointestinal illness among prisoners. We conducted a cross-sectional study to determine the extent, causative agent, and possible source of the outbreak.

Materials and Methods

A case-patient was defined as an individual with acute gastroenteritis and diarrhea with at least three loose stools per 24 hr and/or vomiting and/or abdominal pain. A standardized questionnaire was used to interview case-patients about age, gender, and type of food consumed during the previous two days, timing, symptoms, possible sources, and presence of illness in close contacts. Restaurant employ-

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Accepted for publication: 24 February 2010