How to Diagnose a Foodborne Illness

Michael S. Donnenberg, MD[a,b,c,*], Shivakumar Narayanan, MD[d]

KEYWORDS

• Outbreaks • Diagnosis • Foodborne illness • Food poisoning • Microbiology
• Stool culture • Pulsed-field gel electrophoresis • Stool antigen detection

KEY POINTS

- Foodborne infections are of major public health importance, owing to their potential to cause widespread illness.
- The timely recognition of foodborne origin of a gastrointestinal illness, appropriate testing, and reporting to public health authorities can help curtail further spread of an outbreak.
- Identification of common food-vehicle exposures and knowledge of incubation periods of common foodborne pathogens can provide epidemiologic clues to diagnosing a pathogen in an outbreak.
- Stool cultures can be ordered when signs of inflammatory diarrhea are observed. The "3-day rule" is a useful guide to selective ordering of cultures in hospitalized patients.
- Culture-independent methods of stool identification of pathogens present their own advantages and disadvantages.
- Molecular subtyping and surveillance by pulsed-field gel electrophoresis has greatly aided investigation and confirmation of foodborne outbreaks.

Funding: Public Health Service awards R01 AI 32074, U19 AI 090873, R03 AI 097953 from the National Institute of Allergy and Infectious Diseases (M.S. Donnenberg); None (S. Narayanan). Conflict of Interest: None.

[a] Department of Medicine, University of Maryland School of Medicine, 20 Penn Street, S243, Baltimore, MD 21201, USA; [b] Department of Microbiology and Immunology, University of Maryland School of Medicine, 20 Penn Street, S243, Baltimore, MD 21201, USA; [c] Medical Scientist Training Program, University of Maryland School of Medicine, 20 Penn Street, S243, Baltimore, MD 21201, USA; [d] Division of Infectious Diseases, Department of Medicine, Institute of Human Virology, University of Maryland Medical Center, 725 West Lombard Street, Room N149, Baltimore, MD 21201, USA
* Corresponding author. Health Sciences Facility II, University of Maryland School of Medicine, 20 Penn Street, S243, Baltimore, MD 21201.
E-mail address: mdonnenb@umaryland.edu

Infect Dis Clin N Am 27 (2013) 535–554
http://dx.doi.org/10.1016/j.idc.2013.05.001 **id.theclinics.com**
0891-5520/13/$ – see front matter © 2013 Elsevier Inc. All rights reserved.

INTRODUCTION

Acute diarrheal illnesses are a significant cause of global morbidity and mortality, especially among those at the extremes of ages and those who are malnourished. On a global scale, diarrhea is estimated to account for 18% of all deaths in children younger than 5 years.[1] Foodborne diseases are challenges in both developing and developed countries, owing to changes in our food production and supply chains, changes in our environment leading to contamination, new and emerging pathogens, antibiotic resistance among pathogens, and the propensity of the known pathogen vehicles to cause multistate outbreaks. The Centers for Disease Control and Prevention (CDC) estimate that each year roughly 48 million people in the United States become ill, 128,000 are hospitalized, and 3000 die from infections from foodborne pathogens.[2] In addition to the acute morbidity and mortality, some of these infections can cause significant long-term sequelae, for example, hemolytic-uremic syndrome causing renal failure following infection with Shiga toxin–producing *Escherichia coli*, and Guillain-Barré syndrome following *Campylobacter jejuni* infection.[3] An estimated $6 billion is spent each year in the United States on medical care and lost productivity attributable to foodborne illnesses.[4]

The Foodborne Diseases Active Surveillance Network (FoodNet) is a system of active population-based surveillance of laboratory-confirmed cases of infection in 10 geographic regions in the United States caused by 9 common foodborne pathogens of public health importance. FoodNet estimates that, during 2011, 18,964 cases of foodborne illness were documented, which resulted in 4398 hospitalizations and 82 deaths.[5] Advances in pathogen detection and discrimination in identification by molecular methods have enabled early and effective surveillance for specific foodborne pathogens and the detection and control of outbreaks.[6]

More than 30 pathogens cause the major burden of foodborne illnesses in the United States (**Table 1**). Of these, Norovirus accounted for 58% of all illness followed by nontyphoidal *Salmonella* spp (11%), *Clostridium perfringens* (10%), and *Campylobacter* spp (9%). *Salmonella* was also the leading cause of hospitalization and death.[7]

ASSESSMENT

The health care provider's initial approach to patients with a suspected foodborne illness is to conduct a careful history and physical examination, and to evaluate and treat for dehydration if present. The provider often assumes responsibility not just to the individual patient but to the community as a whole if an outbreak is suspected. A clinician should be alert to the possibility that any patient with foodborne illness may represent the sentinel case of a more widespread outbreak. A foodborne disease outbreak (FBDO) is defined as an incident whereby 2 or more persons experience a similar illness resulting from the ingestion of a common food.[12] The CDC's Outbreak net Web site (http://www.cdc.gov/outbreaknet/report_healthcare.html) can be accessed for descriptive criteria, incubation periods, descriptions of clinical syndromes, and guidelines for confirmation, as well as contact information of the CDC.

The provider should ascertain how and when the illness began, stool characteristics (frequency, consistency, and quantity), signs or symptoms of dehydration, and previous significant medical conditions. The history should include symptoms suggesting severity (ie, fever, blood in stool, weight loss, lethargy, voluminous diarrhea, proctalgia, tenesmus, or abdominal pain). A clinician should also be aware that not all foodborne illnesses have gastrointestinal manifestations.

An epidemiologic history requires asking about specific foods consumed in the period leading up to the symptoms, the onset of symptoms in relation to the time of

Download English Version:

https://daneshyari.com/en/article/3404108

Download Persian Version:

https://daneshyari.com/article/3404108

Daneshyari.com