Editorial

Yersinia enterocolitica: A New or Unrecognized Nosocomial Pathogen?

William R. Jarvis, MD

Yersinia enterocolitica is a facultative anaerobic gram-negative bacterium first described as a human pathogen in 1939.[1] Since that time, *Y enterocolitica* has emerged as a cause of gastroenteritis throughout the world. Although numerous serotypes exist, human disease usually is associated with a small number of serotypes, in particular serotypes 0:3, 0:9, 0:5, 27, and 0:8. Thus, although *Y enterocolitica* commonly can be isolated from environmental sources, including terrestrial and freshwater ecosystems, these are usually nonpathogenic variants. Similarly, all *Y enterocolitica* isolated from human sources are not pathogenic; therefore, strains should be serotyped to document that they are pathogenic strains.

In some countries, such as Belgium, the Netherlands, Australia, and Canada, *Y enterocolitica* has become almost as common as *Salmonella* and *Campylobacter* as causes of acute bacterial gastroenteritis. In these countries, serotypes 0:3 and 0:9 predominate, and outbreaks are rarely reported. In contrast, in the United States, sporadic cases have involved a variety of serotypes, and until recently, most outbreaks were serotype 0:8. In industrialized countries where *Y enterocolitica* infections are most common, food derived from pigs has been the major source of human infection.[2]

In the past 20 years, there have been seven reported foodborne outbreaks of *Y enterocolitica* infection in the United States.[1,3] These have involved 16 to 159 persons (median 38), have had primary attack rates of 10% to 76%, and have had very low secondary attack rates. The incubation period has ranged from one to 11 days. The sources of these outbreaks have been pets, chocolate or powdered milk, chow mien, tofu packed in spring water, bean sprouts immersed in well water, and chitterlings. Serotypes involved include 0:8 (5), 0:13a, 13b (1), and most recently 0:3 (1).

Before April 1987, there were only three reported episodes of *Y enterocolitica* sepsis associated with packed red blood cells; none had occurred in the United States. Since April 1987, 13 episodes have occurred in ten states.[4-6] In each episode, an in- or outpatient received a transfusion of packed red blood cells that had been contaminated with *Y enterocolitica*. Subsequently, these patients developed hypotension, respiratory failure, or renal failure. Seven of the 13 patients died despite aggressive supportive therapy. In each episode, the contamination was traced to the blood donor who was asymptomatic at the time of donation. Approximately half of the donors reported gastrointestinal symptoms within three weeks before donation or immediately after donation. All donors had serologic evidence of recent *Y enterocolitica* infection. Serotypes involved include 0:3 (6), 0:5, 27 (4), 0:1,2,3 (2), and 0:20 (1). The Centers for Disease Control, Food and Drug Administration, and blood banking community continue to seek a preventive intervention.

These recent outbreaks suggest that *Y entero-*

From the Infection and Prevention Branch, Hospital Infections Program, National Center for Infectious Diseases, Centers for Disease Control US Public Health Service, Atlanta, Georgia.

Address reprint requests to William R. Jarvis, MD, Mailstop A07, Hospital Infections Program, Centers for Disease Control, Atlanta, GA 30333.

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colitica has become more widespread in the United States. In particular, serotype 0:3, which predominates in Europe but has been infrequently recovered in the United States in the past, appears to be increasing. This serotype may have become more prevalent among US swine herds, If the United States follows the pattern of other industrialized countries where this serotype predominates, an increase in human *Y enterocolitica* infections should be expected.

In this issue of *Infection Control and Hospital Epidemiology,* Cannon and Linnemann reviewed their hospitals experience with recovery of *Y enterocolitica* over a four-year period.[7] Of 18 patients identified with Y *enterocolitica* infection, five appeared to be hospital-acquired. In most episodes, a patient admitted with community-acquired *Y enterocolitica* gastroenteritis appeared to be the source of transmission via direct or indirect contact. Medical personnel appeared to play an important role in transmission of *Y enterocolitica* from patient to patient.

Y enterocolitica is a rarely reported nosocomial pathogen. In the last decade, only *two Y enterocolitica* infections have been reported through the National Nosocomial Infections Surveillance System, and since 1973, only three nosocomial outbreaks have been reported in the world's literature; no nosocomial Y *enterocolitica* outbreaks have been reported in the United States.[1,7] This and previous reports provide several clues as to why *Y enterocolitica* infections rarely are recognized. First, many clinicians do not maintain a high index of suspicion for *Y enterocolitica* infections. Second, many laboratories either do not routinely culture for *Y enterocolitica* or they fail to use techniques, such as cold enrichment, enhancement broth, or selective media, that enhance Y *enterocolitica* recovery. Third, *Y enterocolitica* transmission appears to be relatively inefficient-large, explosive hospital outbreaks have not been reported, and when transmission is suspected, it is usually in a small number of patients or healthcare workers with close contact. In four years of surveillance, Cannon and Linnemann identified only five episodes of possible nosocomial transmission; in three episodes, a community-acquired case was the likely source and, in each episode, transmission was documented to only one patient. Lastly, when infection occurs, disease may not necessarily follow, or if gastroenteritis develops, Y *enterocolitica* may not be recoverable from the stool.

This report shows the value of collecting and examining nosocomial infection surveillance data. With frequent review of these data, unusual nosocomial pathogens will be identified. This will permit intensive investigation by the infection control staff to identity the source and mode of transmission and introduce control measures.

Little is known about the epidemiology of nosocomial *Y enterocolitica* infections. Because of the frequency of nonpathogenic serotypes, serotyping is helpful in supporting the role of the isolate causing the illness and in establishing links between cases. lb further our knowledge, when infection with pathogenic serotypes is detected, further epidemiologic studies are warranted. These studies should evaluate whether food, blood, other patients, or personnel is the source of infection, whether asymptomatic carriers are present, whether personnel are epidemiologically linked to transmission, and what host factors place patients at greatest risk. With advances in *Y enterocolitica* typing systems, isolates should be examined not just by serotype but also by restriction endonuclease digest analyses or restriction frequent length polymorphism.[8]

These cases serve as a reminder of the importance of carefully evaluating each hospitalized patient for symptoms of gastroenteritis and placing them in enteric isolation precautions, reinforcing the importance of handwashing to all hospital staff, and removing infected hospital personnel from patient or food contact. Only through the careful practice of these proven infection control precautions can we prevent the person-to-person transmission of nosocomial enteric pathogens, including *Y enterocolitica.*[9]

Prevention of foodbome *Y enterocolitica* infections requires strict attention to food preparation and handling. Prevention of packed red cell transmission-associated *Y enterocolitica* infections remains a high priority but awaits the identification of a simple, practical and inexpensive prevention intervention.

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