Yersinia enterocolitica, an Enigmatic Microbial Entity

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Description

Y. enterocolitica is a gram negative bacterium which is basically an important cause of acute gastroenteritis. While taxonomically related species Yerainia pseudotuberculosis and Yersinia pestis have been known since the 18th century. In the United States Y. enterocolitica was first reported in 1939 by Schleifstein and Coleman [1] who isolated a bacterium which in retrospect was identified as Yersinia enterocolitica 08 and followed by a bacteremia case in 1974 authored by keet [2]. However in the United States the most important event was the 1974 outbreak in Holland Patent in upstate New York [3] in which 227 school children and employees in 5 area schools ingested Yersinia enterocolitica contaminated chocolate milk resulting in 12 children undergoing appendectomies unnecessarily. This epidemic outbreak was investigated by doctor RF Black et al who published his report in 1978 [3]. Interestingly, the doctors learned that the abdominal symptoms were not attributable to appendectomies revealed that Y. enterocolitica gastrointestional infection could mimic appendicitis. Amazingly, 5 years later [3] a second outbreak occurred in a summer camp also in upstate which involved 239 campers of which five underwent appendectomies.

Both outbreaks were attributed to serotype 0:8 Y. enterocolitica which has been thought to exist only in limited areas of North America. Based on this data, Y. enterocolitica was described as psychrophilic and can survive and replicate at temperatures ranging from 0 to 44 degrees. This finding was confirmed by Keet who reported a hiker who developed a Y. enterocolitica septicemia after drinking melted water from a frozen mountain stream. Keet subsequently cultured water from the frozen stream and recovered a strain of Y. enterocolitica identical to the isolate responsible for the hikers’ septicemia that was indole positive and serotype 0:8 (Figures 1 and 2).

Clinically E. enterocolitica over the years has widened its capacity to cause a wide range of nongastrintestinal primary infections worldwide inclusive of cutaneous infections, endocarditis, abscesses, pneumonia, nosocomial infections, meningitis, osteomyelitis, mycotic aneurism, urinary tract infections, and septic arthritis. Yersinia enterocolitica can evade host defense to cause infections in both immunocompromised and immunocompetent individuals.

Figure 1: Bacillary forms are a methylene blue stained smear of Yersinia enterocolitica after growth on agar media.

Figure 2: Gram stained smear showing coccobacilli Yersinia enterocolitica some with capsules (clear halos around them).

References