

Miscellaneous enterics

1. Name of the Organism:

Miscellaneous enterics, Gram-negative genera including: *Klebsiella*, *Enterobacter*, *Proteus*, *Citrobacter*, *Aerobacter*, *Providencia*, *Serratia*

2. Name of Acute Disease:

3. Nature of Disease:

These rod-shaped enteric (intestinal) bacteria have been suspected of causing acute and chronic gastrointestinal disease. The organisms may be recovered from natural environments such as forests and freshwater as well as from farm produce (vegetables) where they reside as normal microflora. They may be recovered from the stools of healthy individuals with no disease symptoms. The relative proportion of pathogenic to nonpathogenic strains is unknown.

Gastroenteritis is name of the disease occasionally and sporadically caused by these genera.

Acute gastroenteritis is characterized by two or more of the symptoms of vomiting, nausea, fever, chills, abdominal pain, and watery (dehydrating) diarrhea occurring 12-24 hours after ingestion of contaminated food or water. Chronic diarrheal disease is characterized by dysenteric symptoms: foul-smelling, mucus-containing, diarrheic stool with flatulence and abdominal distention. The chronic disease may continue for months and require antibiotic treatment.

Infectious dose--unknown. Both the acute and chronic forms of the disease are suspected to result from the

elaboration of enterotoxins. These organisms may become transiently virulent by gaining mobilizable genetic elements from other pathogens. For example, pathogenic *Citrobacter freundii* which elaborated a toxin identical to *E. coli* heat-stable toxin was isolated from the stools of ill children.

4. Diagnosis of Human Illness

Recovery and identification methods for these organisms from food, water or diarrheal specimens are based upon the efficacy of selective media and results of microbiological and biochemical assays. The ability to produce enterotoxin(s) may be determined by cell culture assay and animal bioassays, serological methods, or genetic probes.

5. Associated Foods:

These bacteria have been recovered from dairy products, raw shellfish, and fresh raw vegetables. The organisms occur in soils used for crop production and shellfish harvesting waters and, therefore, may pose a health hazard.

6. Relative Frequency of Disease:

Acute gastrointestinal illness may occur more frequently in undeveloped areas of the world. The chronic illness is common in malnourished children living in unsanitary conditions in tropical countries.

7. Usual Course of Disease and Some Complications:

Healthy individuals recover quickly and without treatment from the acute form of gastrointestinal disease. Malnourished children (1-4 years) and infants who endure chronic diarrhea soon develop structural and functional abnormalities of their intestinal tracts resulting in loss of ability to absorb nutrients. Death is not uncommon in these children and results indirectly from the chronic toxigenic effects

8. Target Populations:

which produce the malabsorption and malnutrition.

All people may be susceptible to pathogenic forms of these bacteria. Protracted illness is more commonly experienced by the very young.

9. Food Analysis:

These strains are recovered by standard selective and differential isolation procedures for enteric bacteria. Biochemical and in vitro assays may be used to determine species and pathogenic potential. Not being usually thought of as human pathogens, they may easily be overlooked by the clinical microbiology laboratory.

10. Selected Outbreaks:

Intestinal infections with these species in the U.S. have usually taken the form of sporadic cases of somewhat doubtful etiology.

Citrobacter freundii was suspected by CDC of causing an outbreak of diarrheal disease in Washington, DC. Imported Camembert cheese was incriminated.

For more information on recent outbreaks see the [Morbidity and Mortality Weekly Reports](#) from CDC.

CDC/MMWR

The CDC/MMWR link will provide a list of Morbidity and Mortality Weekly Reports at CDC relating to this organism or toxin. The date shown is the date the item was posted on the Web, not the date of the MMWR. The summary statement shown are the initial words of the overall document. The specific article of interest may be just one article or item within the overall report.

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January 1992 with periodic updates

Hypertext last updated by mow/xxz/ear 2000-MAR-08