Kentucky Antimicrobial Stewardship Innovation Consortium

Educational Pearl

Don't Let the Bug Beat You: Diarrheagenic *E. coli*

Escherichia coli is a gram-negative bacteria known to cause infectious diarrhea. There are six different kinds of diarrheagenic *E. coli* including enterohemorrhagic (Shiga toxin-producing) *E. coli* (EHEC/STEC), enterotoxigenic *E. coli* (ETEC), enteropathogenic *E. coli* (EPEC), enteroinvasive *E. coli* (EIEC), enteroaggregative *E. coli* (EAEC), and diffusely adherent *E. coli* (DAEC). What is the difference between these *E. coli*? When a stool specimen tests positive for one of these *E.coli*, how should they be managed?

What is the difference between these *E. coli*?

The six major types of diarrheagenic *E. coli* are categorized by different virulence factors. There is overlap in clinical presentations (e.g. watery diarrhea) with some differences in primary symptoms, transmission, and geographical etiology. While all will cause diarrhea, bloody diarrhea is seen with STEC and EIEC. Transmission through contaminated food is primarily seen with STEC and ETEC. EAEC and ETEC are causes of traveler's diarrhea. STEC and EAEC may be seen in high-income countries whereas the others are seen in low-income countries.[1]

How is diarrheagenic *E. coli* diagnosed?

A specific pathogen in patients with diarrhea is often not identified. Microbiological identification is of limited clinical utility as management does not differ between different diarrheagenic *E. coli* with the exception of STEC. Stool culture and Shiga toxin assay testing are recommended to detect STEC in patients with diarrhea with fever, bloody or mucoid stools, severe abdominal cramping or tenderness, or signs of sepsis. Testing for STEC is also recommended in those with diarrhea who have recently swam in or drank untreated fresh water, been exposed to healthcare, long-term care, day-cares, or visited a farm or petting zoo.[2]

Molecular gastrointestinal panels are also available and capable of detecting several different types of diarrheagenic *E. coli*.

How should diarrheagenic *E. coli* be managed?

Diarrhea is mostly self-limiting and management is primary rehydration and supportive care. The IDSA Infectious Diarrhea guidelines recommend against empiric antibiotics, however they note that empiric antibiotics may be considered in those with bloody diarrhea who are immunocompromised, < 3 months of age, recently traveled with temperatures ≥ 38.5°C/101.3°F and/or signs of sepsis, or immunocompetent patients with fever, abdominal pain, and bacillary dysentery. Empiric antibiotics options include fluoroquinolones or azithromycin for adults and third generation cephalosporins for children depending on local susceptibilities and travel history.[2]

If STEC is identified, specifically *E. coli* 0157 or Shiga toxin 2, antibiotics should be AVOIDED, as they have been associated with hemolytic uremic syndrome.[2]

Key Takeaway: Several diarrheagenic *E. coli* exists, but specific identification is often not done and of limited clinical utility. An exception is STEC, where antibiotics should be AVOIDED to decrease risk for hemolytic uremic syndrome.

References:

1. Kinds of E. coli. CDC. Updated May 14, 2024. Accessed June 23, 2025. Available at: https://www.cdc.gov/ecoli/about/kinds-of-ecoli.html
2. Shane AL, Mody RK and Crump JA et al. 2017 Infectious Diseases Society of America Clinical Practice Guidelines for the Diagnosis and Management of Infectious Diarrhea. *Clin Infect Dis*. 2017;65(12):e45-80.

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