Dysentery (Infectious Diarrhea) — Causes and Treatment

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Dysentery can be caused by either bacterial pathogens such as shigella, salmonella or campylobacter, or by the protozoan Entamoeba histolytica. The usual presenting feature is that of bloody diarrhea, associated with fever and being toxic. Children are at risk of developing certain complications such as seizures, toxic mega-colon or intestinal perforation. Patients presenting with dysentery should undergo a stool analysis and culture testing to identify the causative organism. Empirical therapy with azithromycin is usually sufficient.

Definition of Dysentery

Amoebic dysentery is a disease that is caused by Entamoeba histolytica and presents with bloody mucous diarrhea (dysentery) that lasts less than two weeks in duration. Other common causes of dysentery include Campylobacter, Shigella and salmonella.
Epidemiology of Dysentery

The identification of the etiology of dysentery is important because the clinical course of the disease is usually more severe compared to non-bloody diarrhea. Therefore, the reported number of cases of dysentery is usually classified according to the causative organism.

Salmonella is the most common cause of dysentery with an estimated 1 million cases per year. The second most common cause of dysentery is campylobacter, which is responsible for approximately 845,000 new cases per year in the United States. Shigella is associated with more severe illness but is responsible for a significantly lower number of cases compared to the other common causes, only 131,000 cases per year.

It is important to note that these figures include all cases affected by the given organism and not only true bloody-diarrhea cases. Approximately, 36% of people infected with shigella are going to develop dysentery. On the other hand, 65% of the patients who present with salmonella are at risk of developing dysentery.

E. coli O157:H7, which produces shiga-toxin, is significantly associated with dysentery as approximately 85% of the infected population would develop bloody diarrhea.

Dysentery is more common in children, but the condition can also happen in adults.

Etiology of Dysentery

The most commonly identified organisms of dysentery are shigella, salmonella, campylobacter and Entamoeba histolytica. Fortunately, most laboratories are able to identify these causative organisms from a single stool culture.

While bacterial causes of dysentery are common, the protozoan Entamoeba histolytica should be also excluded in these patients. Other less common organisms include aeromonas, plesiomonas, and yersinia enterocolitica. Yersinia enterocolitica is not a trivial etiology as approximately 65% of the cases are expected to develop bloody diarrhea.
Complications of Dysentery

In addition to acute dehydration, more specific complications of dysentery are common and should be identified early and prevented if possible.

First, patients with dysentery are more likely to require hospitalization, compared to people with non-bloody diarrhea. Hospitalization puts the patient at risk of acquiring hospital-based infections which are caused by multi-resistant organisms.

Shigella-related dysentery, especially in children, can be associated with significant mortality. Patients who are malnourished are at a significantly higher risk of developing severe dysentery and possibly die from the diarrheal illness.

Shigella is also associated with ileus, toxic mega-colon and intestinal obstruction in children. Patients can also develop seizures, headaches, and become confused or lethargic. Urinary tract infections, as a complication of Shigella, are common.

Non-typhoid salmonella and campylobacter are invasive organisms that can cause bacteremia, especially in the immunocompromised.

Shiga-toxin producing E. coli and shigella spp can cause hemolytic-uremic syndrome. This condition is characterized by acute hemolysis leading to anemia and thrombocytopenia and renal failure. Thus, patients may present with dyspnea, bleeding tendencies and uremic features.

Campylobacter associated dysentery might be associated with Guillain-Barré syndrome. One third of the patients develop neurological disturbances. Reactive arthritis is also commonly associated with salmonella and campylobacter dysentery.

Clinical Presentation of Dysentery

The most important clinical presentation of dysentery is the passage of grossly bloody stools. Patients are also usually ill and have a fever.

The immunocompromised might develop bloody diarrhea without significant systemic illness, or might develop severe invasive disease. Patients with hemolytic-uremic syndrome develop acute renal failure, pallor and might become short of breath.

People coming from the developing world are more likely to have amoebic dysentery,
rather than bacterial dysentery. Children who develop bloody diarrhea might be severely dehydrated.

**Diagnostic Workup for Dysentery**

Once a patient presents to the emergency department with bloody stools, it is usually beneficial to actually identify the causative organism rather than starting empirical therapy. The choice of investigations depends largely on the immunologic state of the patient.

Immune-competent patients should undergo a stool analysis and culture. A stool culture can identify *shigella*, *campylobacter*, *salmonella*, *E. coli*, and *E. histolytica*.

The immunocompromised population are at risk of developing cytomegalovirus dysentery in addition to *clostridium difficile* related dysentery. Therefore, testing for cytomegalovirus and for C. difficile toxins is indicated.

**Fecal leukocytes** are common in dysentery. Patients with invasive pathogens might also develop leukocytosis.

Patients with severe disease, who appear toxic, might have developed complications such as toxic mega-colon. In that case, abdominal computerized tomography is useful as it can visualize the colon and exclude the condition.

Finally, patients who are suspected to have the hemolytic-uremic syndrome should undergo renal function testing and a peripheral blood smear in addition to complete blood counting. These tests help identify this severe complication.

**Treatment of Dysentery**

Patients who present with very high fever and severe dysentery should be put on empirical antibiotic therapy until the results are back from the stool culture.

Patients with suspected shigella, salmonella or campylobacter infection should receive azithromycin because this antibiotic covers these three organisms. Adults with suspected salmonella infection are better off with ciprofloxacin, rather than azithromycin.

Patients with clostridium difficile dysentery should receive oral Vancomycin. These
patients are usually immunocompromised or have a recent history of hospital admission.

Children and adults with recent **travel history** to the developing world are at risk of **amoebic rather than bacterial dysentery**. These patients should receive **tinidazole** or **metronidazole**. It is important to note that Entamoeba histolytica can be easily identified with stool analysis, therefore, specific treatment with metronidazole or tinidazole is usually possible early in the disease.

Finally, patients with confirmed diagnosis of shiga-toxin producing E. coli should receive azithromycin or **rifaximin**. While the organism is sensitive to other antibiotics, other antibiotics are thought to be responsible for the increased production of the shiga-toxin by the bacteria; hence, an increased risk of developing the hemolytic-uremic syndrome.

Additionally, the current diagnostic approaches, even though are helpful and easy to perform, are considered as costly to the developing world where diarrheal illness is more common. Therefore, the identification of the causative organism and specific treatments are usually difficult to obtain in areas where dysentery is endemic.

**References**


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