Dysentery (Infectious Diarrhea): Causes and Treatment

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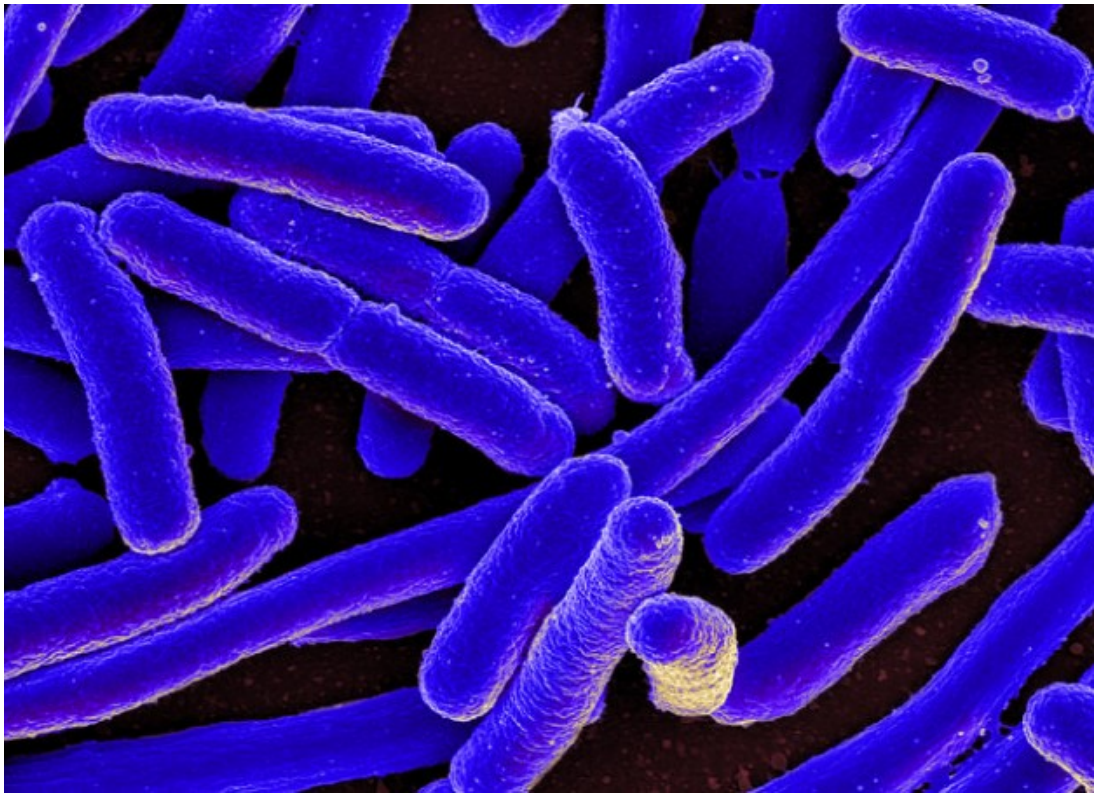
Dysentery can be caused by either bacterial pathogens such as shigella, salmonella or campylobacter, or by the protozoan Entamoeba histolytica. The usual presenting feature is that of bloody diarrhea, associated with fever and being toxic. Children are at risk of developing certain complications such 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

Amoebic dysentery is a disease that is caused by ***Entamoeba histolytica*** and presents with **bloody mucous diarrhea (dysentery)** that lasts less than 2 weeks. Other common causes of dysentery include **campylobacter, shigella,** and **salmonella**.

Epidemiology

The identification of the etiology of dysentery is important, as the clinical course of the disease is usually more severe than that of non-bloody diarrhea. Therefore, the number

of cases of dysentery is usually classified according to the causative organism.

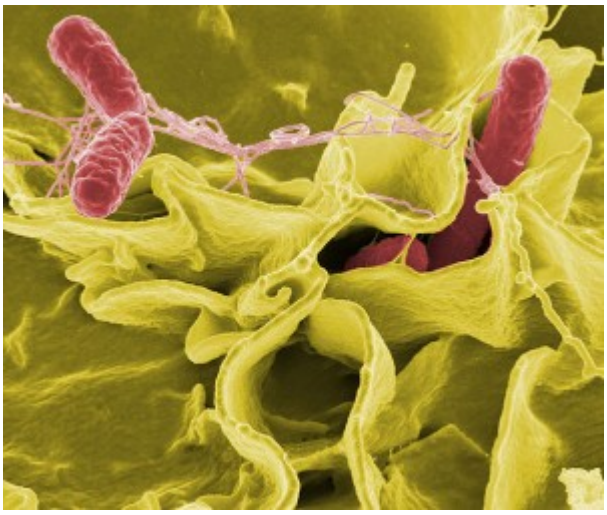


Image: Color-enhanced scanning electron micrograph showing *Salmonella typhimurium* (in red) invading cultured human cells.

Salmonella is the most common cause of dysentery, with an estimated 1 million cases per year (see image). The second most common cause 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 (131,000) compared with other common causes.

These figures include all cases affected by the given organism and not only true bloody-diarrhea cases. Approximately 36% of patients infected with shigella will develop dysentery. However, 65% of patients who present with salmonella are at risk of developing dysentery.

Description

***Escherichia coli* O157:H7**, which produces **shiga toxin,** is significantly associated with dysentery, as approximately 85% of infected patients will develop bloody diarrhea.

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

Etiology

The most commonly identified organisms of dysentery are **shigella**, **salmonella**, **campylobacter,** and ***E. histolytica***. Fortunately, most laboratories can identify all of these causative organisms from a single stool culture.

While bacterial causes of dysentery are common, *E. histolytica* should be excluded in these patients. Other less common organisms include **aeromonas**, **plesiomonas**, and ***Yersinia enterocolitica***. *Y. enterocolitica* is an important trivial etiology. as approximately 65% of patients go on to develop bloody diarrhea.

Complications

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

Patients with dysentery are more likely to require **hospitalization** compared with 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 dying from diarrheal illness.

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

Image: Campylobacter jejuni, which triggers about 30% of cases of Guillain-Barré syndrome. License: Public domain.

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. Patients may present with dyspnea, bleeding tendencies, and uremic features.

Campylobacter-associated dysentery may be associated with **Guillain-Barré syndrome** (see image). One-third of patients develop neurological disturbances. **Reactive arthritis** is also commonly associated with salmonella and campylobacter dysentery.

Clinical Presentation

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

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

Patients who come from the developing world are more likely to have amoebic dysentery, rather than bacterial dysentery. Children who develop bloody diarrhea may be severely **dehydrated**.

Diagnostic Work-up

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

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

Immunocompromised patients are at risk of developing **cytomegalovirus dysentery** in addition to ***Clostridium difficile–***related dysentery. Testing for cytomegalovirus and for *C. difficile* toxins is therefore indicated.

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

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

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

Treatment

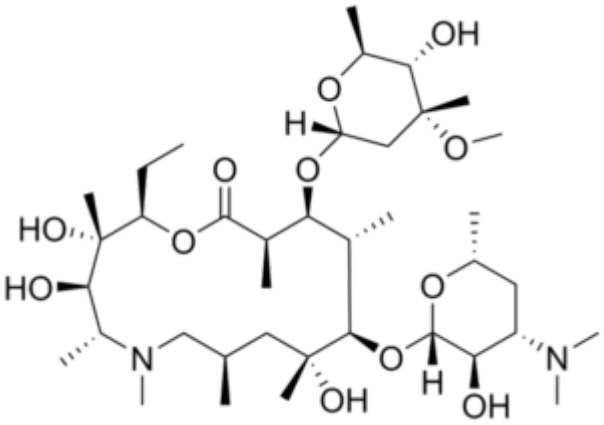


Image: Chemical structure of azithromycin. By: Edgar181.
License: Public domain.

Patients who present with very high fever and severe dysentery should be put on **empirical antibiotic therapy** until the stool culture results confirm the diagnosis.

Patients with suspected shigella, salmonella, or campylobacter infection should receive **azithromycin,** as this antibiotic is effective for treating all of these organisms. Adults with suspected salmonella infection should be started on **ciprofloxacin,** rather than azithromycin.

Patients with *C. 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**. *E. 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 a 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 shiga toxin by the bacteria; hence, there is an increased risk of developing hemolytic-uremic syndrome.

Additionally, current diagnostic approaches, though helpful and easy to perform, are costly in 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

Pfeiffer ML, DuPont HL, Ochoa TJ. The patient presenting with acute dysentery – a systematic review. J Infect. 2012 Apr;64(4):374-86. doi: 10.1016/j.jinf.2012.01.006. Review. PubMed PMID: 22266388

Notes