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Jayne Jennings Dunlap,
DNP, APRN, FNP-C
Department Editor

ASSESSING ACUTE DIARRHEA

Jayne Jennings Dunlap, DNP, APRN, FNP-C
Sheila Patterson, MSN, APRN, FNP-C

Acute Diarrhea

Acute diarrhea has been linked to more than 30 major pathogens and several unspecified agents, collectively accounting for greater than 45 million episodes, 126,000 hospitalizations, and 3,000 deaths per year in the United States (U.S.) alone (Klapproth, 2018). Worldwide, acute diarrhea has been associated with 2.5 million deaths annually (Barr & Smith, 2014). Following respiratory disease, acute gastroenteritis is the most common family illness in the U.S. (Dains, Baumann, & Scheibel, 2020).

Diarrhea is defined as the passage of abnormally loose stools and is typically associated with excessive defecation frequency (three or more stools per day) plus excessive stool output (Klapproth, 2018). When these changes are present for 14 days or less, acute diarrhea is constituted (Borum & Baumgartner, 2021). Acute diarrhea may be infectious or noninfectious and is often categorized as watery or inflammatory (Table 1).

Pathophysiology

In the U.S., bowel movement frequency varies considerably from person to person. Stool frequency typically ranges from two bowel movements per week to three bowel movements daily. Changes in stool frequency, volume, and consistency may indicate disease (Dains et al., 2020). Greater than 90% of acute diarrhea cases are caused by invasion of the gastrointestinal tract by viruses, bacteria, or parasites (Klapproth, 2018).

Numerous bacterial, viral, and protozoal etiologies may lead to acute diarrheal states (Table 2). Pathogens that cause watery diarrhea typically invade the small bowel, and the diarrhea results from altered electrolyte secretions and/or enterotoxin absorption. Pathogens adhere to mucosal surfaces without invading the epithelium, resulting in no/minimal mucosal damage. In contrast, inflammatory diarrhea results from invasive pathogens that usually infect the colon. The inflammatory response leads to ulcerations and mucosal damage, leading to loss of serum proteins, mucous, and leaking of blood (Klapproth, 2018).

TABLE 1. Acute Diarrhea Classifications

Watery diarrhea
- Implies primary defect in water/electrolyte absorption
- Presents with large-volume watery stools
- Often lack severe abdominal pain
- No blood or pus in stool
- Potential for profound dehydration
- Signs of fever/systemic illness often absent (may have accompanied nausea/vomiting)

Inflammatory diarrhea
- Implies elicitation of inflammatory response
- Characterized by tenesmus and blood/mucous in stool
- Present with fever and may have signs of systemic illness (rash, joint symptoms)
- Experience numerous small-volume stools (bloody, mucoid, or both)
- Are less likely to be dehydrated because of smaller volume stools

Note. From "Causes of Acute Diarrhea," by J. A. Klapproth, 2018, In S. Srinivasan & L. Friedman (Eds.), *Essentials of Gastroenterology* (pp. 71–87), Hoboken, NJ: Wiley.

TABLE 2. Common Etiologies of Acute Diarrhea

Bacterial
- *Salmonella*
- *Escherichia coli*
- *Shigella*
- *Campylobacter jejuni*
- *Vibrio cholerae*
- *Vibrio parahaemolyticus*
- *Clostridium difficile*
- *Yersinia enterocolitica*
- *Staphylococcus aureus*
- *Listeria monocytogenes*
- *Clostridium perfringens*
- *Bacillus cereus*

Viral
- *Norovirus and rotavirus (most common)*
- *Astrovirus*
- *Adenovirus*
- *Cytomegalovirus (immunocompromised status)*

Protozoal
- *Entamoeba histolytica*
- *Giardia lamblia*
- *Cryptosporidium*
- *Cyclospora*
- *Microspora*
- *Isospora belli*

Note. From "Causes of Acute Diarrhea," by J. A. Klapproth, 2018, In S. Srinivasan & L. Friedman (Eds.), *Essentials of Gastroenterology* (pp. 71–87), Hoboken, NJ: Wiley.

General acute diarrhea prevention measures include the following:

- Frequent handwashing;
- Avoidance of uncooked/undercooked meats, unpasteurized milk, and raw shellfish;
- Proper water/food precautions;
- Rotavirus vaccine (infants); and
- Cholera and thyroid fever vaccine (prior to travel to endemic areas).

Presentation

The cornerstone of acute diarrhea assessment is a thorough history (Klapproth, 2018). On the basis of a detailed history, there is often no need for an extensive workup. Elicited information should include the patient's normal stooling pattern compared with the new diarrheal onset. Documenting when the diarrhea began, whether onset was gradual or abrupt, number of stools per 24 hours, consistency and timing of bowel movements with respect to sleep, and mealtimes aids in framing the clinical picture. Any associated symptoms (abdominal cramping, bloating, nausea, vomiting, fever, rash) and improvement or worsening throughout the illness course should be noted (Freshman, 2021). Key questions to assess risk of dehydration in infants include the following: (1) number of wet diapers in the previous 24 hours; (2) presence of tears during crying; and (3) display of thirst signs. Adults suspected of having dehydration should be asked (1) how many voids in the previous 24 hours and (2) presence of thirst and/or dry mouth (Dains et al., 2020).

Alternating patterns of diarrhea and constipation, night-time wakening due to diarrheal episodes, and a history of hemorrhoids will assist in diagnostic determinations (Table 3). A history of chronic constipation, manual disimpaction, or recent narcotic use might lead to suspicion of overflow diarrhea in the setting of possible fecal impaction. Gauge of symptom relief in relation to diet and prescription and/or over-the counter medication use should be included within the history (Freshman, 2021).

Prompt medical evaluation is indicated if acute diarrhea is linked with fever, significant or severe abdominal pain, dehydration, bloody stools, or significant unintentional weight loss. Patients with a family history of colorectal cancer in a first-degree relative younger than 50 years, in two or more second-degree relatives, or of inflammatory bowel disease warrant referral to a specialist (Freshman, 2021).

Acute diarrhea is rarely life-threating if hydration is maintained (Borum & Baumgartner, 2021). Acute diarrhea in a neonate or young infant is more serious than that in older children due to low tolerance of fluid volume shifts and a greater likelihood of congenital anomalies and/or associated infections (Dains et al., 2020). Older adults have a higher fat-to-lean muscle ratio, exacerbating risk for dehydration, fluid volume deficit, and electrolyte imbalances. These potential complications put older adults with acute diarrhea

TABLE 3. Acute Diarrhea

Differential diagnosis
- Malabsorption
- Inflammatory bowel disease
- Spastic irritable colon
- Cholinergic agents
- Chemotherapy
- Magnesium-containing antacids
- *Clostridium difficile* secondary to antibiotic use
- Diverticulitis
- Fecal impaction
- Neoplasia
- Endocrinopathies (thyroid disease)

Risk factors
- Failure to observe water/food precautions
- Travel to developing countries
- Daycare exposure
- Antibiotic use
- Proton pump inhibitor use
- Pregnancy (increase in listeriosis)
- Fecal/oral sexual contact
- Nursing home residence

Commonly associated conditions
- Immunocompromised status (HIV infection, chemotherapy, malignancy, autoimmune disease treatment, organ transplant recipient)
- Inflammatory bowel disease

Note. From "Acute Diarrhea," by M. Borum & S. Baumgartner, 2021, In *The 5-Minute Clinical Consult* (pp. 290–291), Philadelphia, PA: Wolters Kluwer.

especially at risk for falls and greater morbidity and mortality rates (Weber & Kelley, 2018).

Physical Examination

Careful physical examination should be performed when a patient presents with acute diarrhea and is most useful in determining symptom severity (Klapproth, 2018). Obtaining accurate weight and vital signs is of key importance. Determination of whether unintentional weight loss (acute or gradual) has occurred is crucial (Freshman, 2021). Elevated pulse and decreased blood pressure can indicate fluid volume depletion. Poor skin turgor may also indicate dehydration. The presence of fever is likely more suggestive of inflammatory diarrhea (Borum & Baumgartner, 2021).

Physical assessment of the abdomen, including inspection, auscultation, percussion, and palpation (Weber & Kelley, 2018), must be completed with alertness for the presence of abdominal distention, rebound tenderness, and/or rigidity. Evaluation of rectal tenderness, stool consistency, and presence of blood may also be helpful (Borum & Baumgartner, 2021).

Diagnostic Workup

Attempts at etiological diagnosis may be recommended for epidemiological purposes such as concern for

transmission, during outbreaks, and in circumstances when antimicrobial treatment might be indicated. These may include patients with the following:

- Moderate to severe diarrheal symptoms with or without abdominal pain;
- Symptoms for more than 7 days;
- A history of recent international travel/dysentery (Riddle, DuPoint, & Conner, 2016);
- Profuse watery diarrhea;
- Immunosuppression;
- Diabetes;
- Extremes of age (infants, older age); and
- Malignancy (Klapproth, 2018).

Laboratory testing is typically reserved for patients who fall into these categories. Initial laboratory tests may include the following:

- Complete blood cell count;
- Serum glucose and electrolytes;
- Creatinine and blood urea nitrogen;
- Stool sample; and
- Inflammatory markers (C-reactive protein, sedimentation rate).

Radiographic or direct imaging including sigmoidoscopy, colonoscopy, computed tomography of the abdomen, upper endoscopy with biopsy, or small bowel follow through may be considered in patients with persistent diarrhea. These are appropriate when empirical or supportive therapy is ineffective and there is no clear diagnosis following blood and stool testing (Borum & Baumgartner, 2021; Freshman, 2021).

Clinical Pearls

Most acute diarrhea is caused by infections, with identification of a specific causative organism occurring only in a minority of cases (Taylor & Gallagher, 2021). The majority of acute diarrhea cases are self-limited without need for diagnostic evaluation. A thorough history and examination enable classification of acute diarrheal illness, assessment of severity, and determination of whether further investigation is warranted. Investigations should be performed on a case-by-case basis only if results will influence the plan of care and outcome (Klapproth, 2018). The mainstay of acute diarrhea treatment is avoiding dehydration through oral rehydration therapy. Intravenous (<- ? sp?) fluids should be utilized in the presence of severe dehydration and/or intolerance of oral rehydration (Borum & Baumgartner, 2021).

During periods of active acute diarrhea, dairy products, coffee, alcohol, vegetables, fruits, red meats, and spicy or heavily seasoned foods may worsen symptoms (Borum & Baumgartner, 2021). Caffeinated products and chewing gum should be avoided. Soft, easily digestible foods are often better tolerated. Antibiotic treatment

is not required for most patients with an acute diarrheal illness (Klapproth, 2018). Stool cultures are recommended if patients present with fever, bloody diarrhea, severe dehydration, signs of inflammatory disease, if patients have symptoms for more than 7 days, or a history of immunosuppression (Borum & Baumgartner, 2021). Empirical antibiotics may be initiated in patients who are severely ill or immunocompromised. Complications of acute diarrhea across the life span can include anemia, volume depletion, shock, and sepsis—occurring most often among the elderly population (Klapproth, 2018).

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