



ACUTE GASTROENTERITIS

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- Diarrhea is the passage of loose or watery stools at least three times in a 24 hour period.
- any deviation from the child's usual pattern should raise concern (particularly with ill appearance, the passage of blood or mucus, or dehydration) regardless of the actual number of stools or their water content.
- **second** leading cause of child mortality; among children younger than 5 years worldwide, it causes an estimated 1.5 to 2 million deaths annually
- duration

ETIOLOGY

- **infectious gastroenteritis**
 - symptom of a systemic illness
- or
- an intra-abdominal surgical emergency

- Infective + Inflammatory
- infective + Non inflammatory
- Non infective + inflammatory
- Non infective + Non inflammatory

TYPE OF INFECTION

PARAMETER	I	II	III
Mechanism	Noninflammatory (enterotoxin or adherence/superficial invasion)	Inflammatory, epithelial destruction (invasion, cytotoxin)	Penetrating
Location	Proximal small bowel	Colon	Distal small bowel
Illness	Watery diarrhea	Dysentery	Enteric fever
Stool examination	No fecal leukocytes Mild or no ↑ lactoferrin	Fecal polymorphonuclear leukocytes ↑↑ Lactoferrin	Fecal mononuclear leukocytes
Examples	<i>Vibrio cholerae</i> ETEC <i>Clostridium perfringens</i> <i>Bacillus cereus</i> <i>Staphylococcus aureus</i> Also [†] : <i>Giardia intestinalis</i> Rotavirus Noroviruses <i>Cryptosporidium</i> spp. EPEC, EAEC <i>Cyclospora cayetanensis</i>	<i>Shigella</i> EIEC STEC NTS <i>Vibrio parahaemolyticus</i> <i>Clostridium difficile</i> <i>Campylobacter jejuni</i> <i>Entamoeba histolytica</i> *	<i>Yersinia enterocolitica</i> <i>Salmonella</i> Typhi, S. Paratyphi, and occasionally NTS, <i>Campylobacter</i> , and <i>Yersinia</i>

Viral Diarrhea

- begin with vomiting
- followed by frequent passage of watery nonbloody stools,
- associated with fever in about half the cases
- The diarrhea lacks fecal leukocytes,
- but stools from 20% of cases contain mucus.
- Recovery with complete resolution of symptoms generally occurs within 7 days.
- disaccharide malabsorption is found in 10–20% of episodes,

❑ Rotavirus

- **winter months.**
- moderate to severe disease in infancy but is less severe later in life.
- The rotavirus vaccine

❑ Norovirus occurs in people of

- all ages,
- year round,
- **the most common cause of outbreaks of acute GE**

- Other viral causes of acute gastroenteritis include astroviruses, sapovirus, and enteric adenoviruses (serotypes 40 and 41).

- Food-borne diarrhea can also result from ingestion of preformed enterotoxins produced by bacteria, such as **Staphylococcus aureus** and **Bacillus cereus**,
- After a short incubation period, vomiting and cramps are prominent symptoms, and diarrhea may or may not be present.

Bacterial Diarrhea

- Fever $>40^{\circ}\text{C}$,
- overt fecal blood,
- abdominal pain,
- no vomiting before diarrhea onset,
- and high stool frequency (>10 per day)

- Nontyphoidal Salmonella produces diarrhea by invading the intestinal mucosa.
- The organisms are transmitted through contact with infected animals (**chickens, iguanas, other reptiles, turtles**) or from contaminated food products, such as **dairy products, eggs, and poultry**.
- A large inoculum of organisms is required for disease because Salmonella is killed by gastric acidity.
- The incubation period for gastroenteritis ranges from 6 to 72 hours but is usually less than 24 hours.

- *Shigella dysenteriae*
- The incubation period is 1-7 days.
- Infection is spread by person-to-person contact or by the ingestion of contaminated food with 10-100 organisms.
- The colon is selectively affected.
- **High fever and febrile seizures** may occur in addition to diarrhea.

- ✓ enterotoxigenic (ETEC),
- ✓ enterohemorrhagic (EHEC) or Shiga toxin-producing (STEC),
- ✓ enteroinvasive (EIEC),
- ✓ Enteropathogenic (EPEC),
- ✓ or enteroaggregative (EAEC).

- ETEC : heat-labile (cholera-like) enterotoxin, heat-stable enterotoxin , or both.
- ETEC is a frequent cause of traveler's diarrhea .

➤ EHEC or STEC, especially the E. coli O157:H7 strain:

- hemorrhagic colitis and most cases of diarrhea associated HUS
- STEC is associated with contaminated food, including unpasteurized fruit juices and especially undercooked beef, and can present with nonbloody diarrhea that then becomes bloody.
- Often no fever

- EIEC invades the colonic mucosa, producing widespread mucosal damage with acute inflammation similar to Shigella.
- EIEC diarrhea is usually watery and is often associated with fever.
- EPEC causes mild watery diarrhea but can cause severe dehydration in young children in resource-poor countries in sporadic or epidemic patterns.

- *Campylobacter jejuni* is spread by person-to-person contact and by contaminated water and food, especially poultry, raw milk, and cheese.
- The organism invades the mucosa of the jejunum, ileum, and colon.
- GBS

- *Yersinia enterocolitica*:
- is transmitted by pets and contaminated food, especially chitterlings.
- Infants and young children characteristically have a diarrheal disease,
- whereas older children usually have acute lesions of the terminal ileum or acute mesenteric lymphadenitis mimicking **appendicitis** or **Crohn disease**.
- Post-infectious **arthritis**, **rash**, and **spondylopathy** may develop.

➤ Clostridium difficile causes diarrhea and/or colitis

- is usually associated with prior antibiotic exposure.
- The organism produces spores that spread from person to person and also as fomites on surfaces.
- Infection is generally hospital-acquired,
- Diagnosis is made by detection of toxin in the stool.
- Infants <12 months of age should not be tested for C. difficile as they are frequently asymptotically colonized

➤ Amebiasis occurs in **warmer** climates,

- *E. histolytica* infects the colon;
- amebae may pass through the bowel wall and invade the liver, lung, and brain.

- Diarrhea is of acute onset,
- **is bloody**,
- and contains leukocytes.

- *G. lamblia* is transmitted through ingestion of cysts
 - The organism adheres to the microvilli of the duodenal and jejunal epithelium.
 - Insidious onset of progressive anorexia, nausea, gaseousness, abdominal distention, watery diarrhea, secondary lactose intolerance, and weight loss is characteristic of giardiasis.

- *Cryptosporidium* causes mild, watery diarrhea in immunocompetent persons that resolves without treatment.
 - It produces severe, prolonged diarrhea in persons with acquired immunodeficiency syndrome

Associated conditions

- Systemic infections :

influenza
Measles
HIV
Malaria
covid

- Serious bacterial infections :

pneumonia
urinary tract infection
meningitis
Sepsis
TSS
AOM

- Surgical emergencies :

intussusception
appendicitis

- Antibiotic-associated diarrhea (AAD)
- Functional diarrhea
- Congenital diarrhea
- Lactase deficiency
- Intoxication
- Heavy metal
- Laxative-induced diarrhea
- Other : specially cause chronic diarrhea

DUMBELS

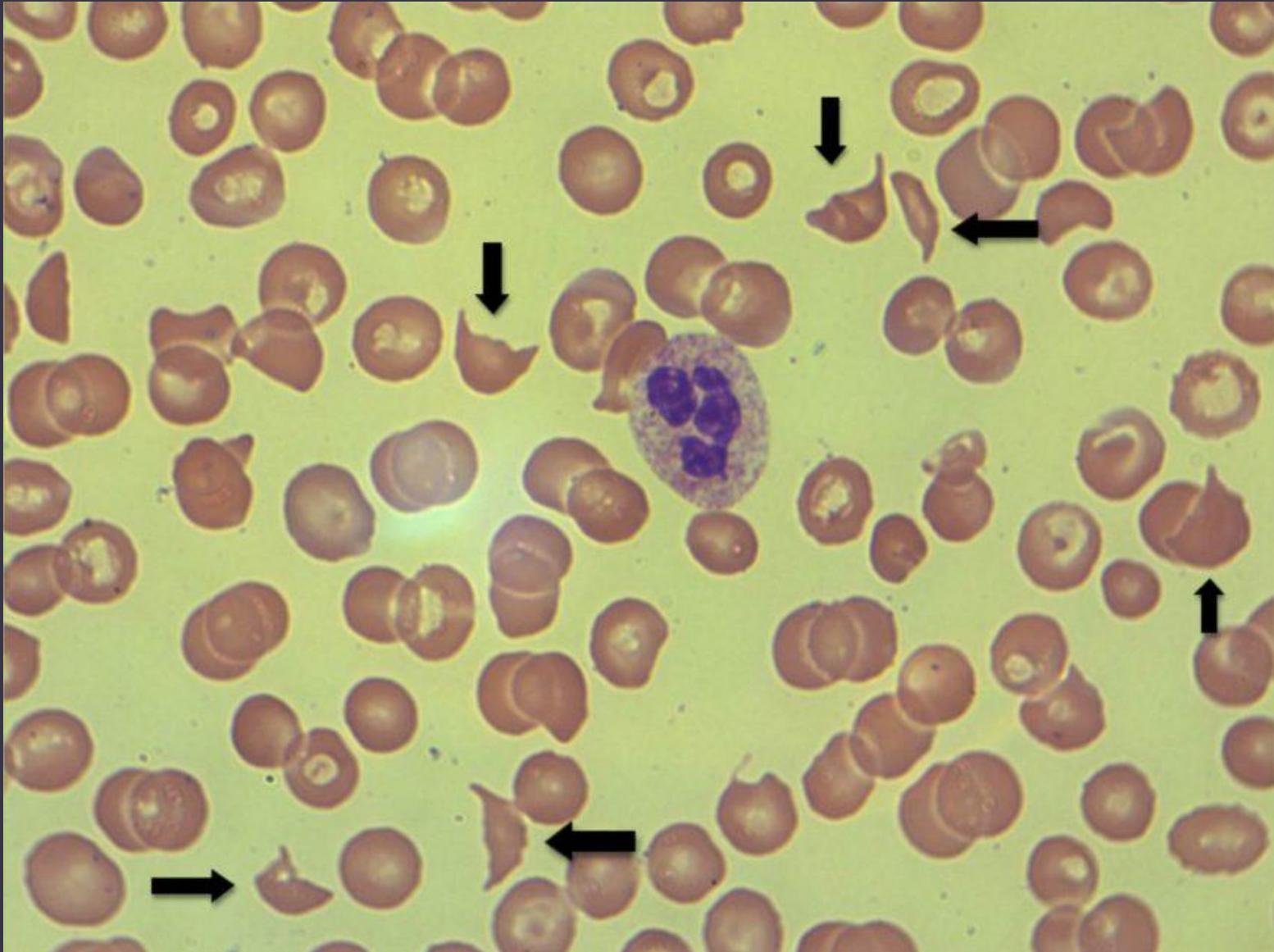
- Diarrhea
- Urination
- Miosis
- Bronchospasm
- Bradycardia
- Bronchorrhea
- Emesis
- Lacrimation
- Salivation





Dx

- Electrolyte measurements
- Renal function test
- CBC – PBS
- Blood culture : fever and/or blood in the stool
who are younger than 3 mo,
immunocompromised,
hemolytic anemia
Other risk factors



- WBC >5
- STEC and *E. histolytica* usually have negative tests
- Stool cultures : clinical features predictive of bacterial moderate or severe disease
immunocompromised
outbreaks with suspected hemolytic-uremic syndrome,

Thank
you

