Acute Infectious Diarrhea

Prepared By

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Intended Learning Outcomes

By the end of the lecture the student should be able to:

▶1- Mention the causes of acute infectious diarrhea

▶2- Select from different clinical symptoms and signs the ones that help reaching diagnosis for the type of diarrhea.

▶3- Interpret data acquired through case scenario to differentiate between inflammatory and non inflammatory diarrhea.

▶4- Have the ability to manage and describe treatment to a case of acute diarrhea.

Definition

Acute infectious diarrhea is defined as an abnormal increase in stool frequency and or fluidity (liquidity) that has an acute onset and lasts for less than 14 days and caused by an infectious agent.
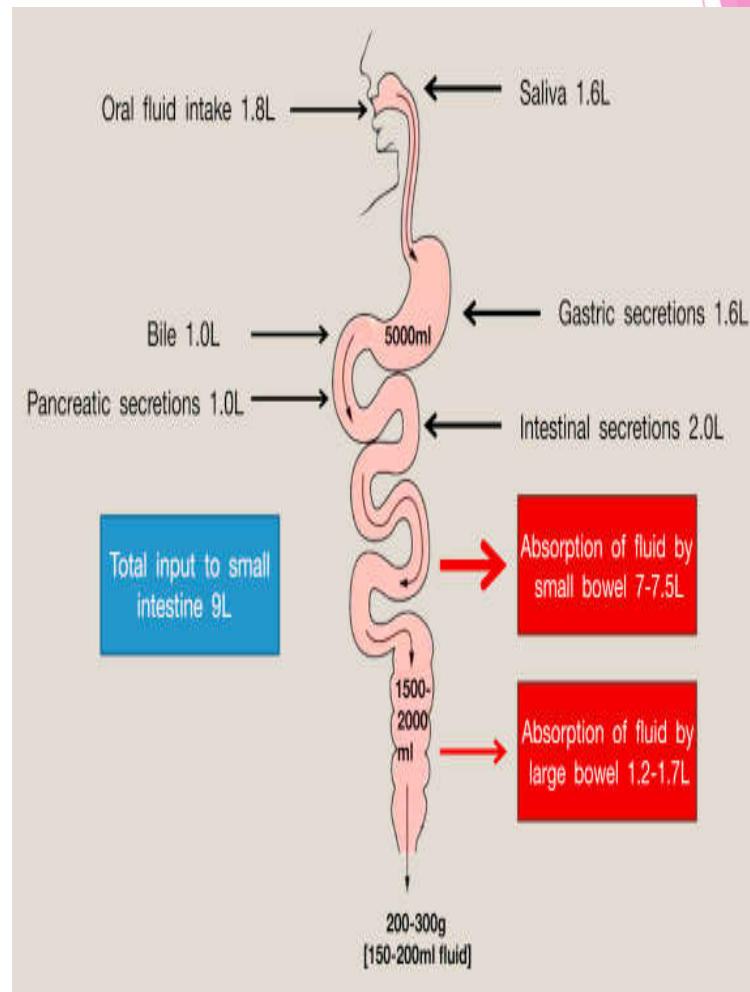
N.B:

Normal bowel frequency in adults ranges from three times/ week up to 2-3 times a day.

Pathophysiology

◆ Normal fluid and electrolyte absorption and secretion: Approximately 8-9 L of fluid enter the intestines daily. Most of the fluid absorbed in small intestine and proximal colon leaving a stool output of about 100-300g/day

Oral fluid intake 1.8L

Saliva 1.6L

Bile 1.0L

Gastric secretions 1.6L

Pancreatic secretions 1.0L

5000ml

Intestinal secretions 2.0L

Total input to small intestine 9L

Absorption of fluid by small bowel 7-7.5L

1500-2000 ml

Absorption of fluid by large bowel 1.2-1.7L

200-300g
[150-200ml fluid]

Causes of Acute Infectious Diarrhea

Diarrhea is classified according the cause into:

A- Inflammatory diarrhea:

Often with systemic features including fever, fecal leukocytes with or without gross blood is usually present.

1-Viral:

▶ Cytomegalovirus infection in immunocompromised patients as AIDS.

2-Bacterial:

▶ **Cytotoxin production**

Fecal leucocytes -ve

E. coli O157:H7
   (Enterohaemorrhagic E.coli)

Vibro parahaemolyticus

Clostridium difficile

3- Parasitic :

Protozoa *as Entamoeba histolytica, Balantidium coli*

Helminths *as Schistosoma mansoni*

▶ **Mucosal invasion**

Fecal leucocytes +ve

Shigella

Salmonella sp.

Enteroinvasive E.coli

Yersinia enterocolitica

Aeromonal

Campylobacter

Differential diagnosis of acute infectious inflammatory diarrhea

▶ It must be differentiated from non infectious causes of inflammatory diarrhea including

❖ Mesenteric ischemia

❖ Radiation colitis

❖ Inflammatory bowel diseases

Non inflammatory Diarrhea

1- Viral:

Norwalk and Rota viruses

2- Parasitic:

Protozoa : *Giardia lamblia*

Cryptosporidium

Helminths: *Strongyloidus stercoralis*

Non inflammatory Diarrhea (Cont..)

3- **Bacterial**

A) Preformed enterotoxin

Staphylococcus aureus

Bacillus cereus

Clostridium perfringes

B) Intra-intestinal enterotoxin production

Enterotoxigenic E. coli

Vibreo Cholerae

Clinical features

▶ **Non inflammatory diarrhea** (small intestinal): high volume, watery, dehydration is frequent, upper or para-umbilical abdominal pain or cramping.

▶ **Inflammatory diarrhea** (colonic involvement): frequent small volume stool, presence of blood, and urgency, lower abdominal cramping and sometimes fever.

Some associated features depend on pathogen:

- **In toxigenic bacteria** as S. aureus or B. cereus; and viral diarrhea: There are nausea and vomiting as prominent symptoms along with watery diarrhea

- **Giardiasis** may be associated with mild steatorrhea and bloating.

- **Invasive bacteria** such as Shigella, Salmonella, Campylobacter, *Enteroinvasive E. coli*: result in abdominal pain, fever, bloody diarrhea

- **Yersinia**: right lower quadrant pain and tenderness mimic acute appendicitis.

Clinical approach for evaluation of acute diarrhea

- **A careful history** is the most important tool to uncover the origin of diarrhea, Th focus should be be on

- **1-Possible causative factors**

- ❖ Travel history

- ❖ Foods eaten including types of food or liquids ingested and location at which food was eaten.

- ❖ Recent hospitalization or closed community confinement as nursing home, boot camp etc..

- ❖ Recent use of antibiotic.

* Exposure to other similarly affected individuals.

* Sexual history including homosexual activity

* History of shellfish ingestion

* Ingestion of canned foods

* Presence of systemic disease as enteric fever

2- Severity of illness: determined from history and examination

* Appearance of stools including presence of blood, mucous or pus.

- Frequency of bowel movements

- Presence of other symptoms including fever, abdominal pain or volume depletion

- **3- Duration of illness**: most infectious diarrhea are self limited. If persists more than 5 days it indicates a more severe illness or a systemic illness with GIT manifestations.

- **Physical examination**: to determine the need for more aggressive therapy or hospitalization.

  Examination should include

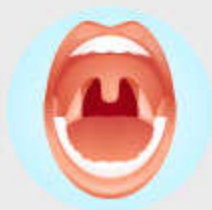- Classification of severity of dehydration

Examination (cont...)

- ▶ Rectal examination for tenderness

- ▶ Measurement of temperature

- ▶ Abdominal examination for tenderness or peritoneal signs.

Sign and Symptoms of Dehydration

Skin with decreased turgor remains elevated after being pulled up and released

- Dry or sticky mouth
- Lethargy
- Sunken eyes
- Weight loss
- Low or no urine input
- Dark yellow urine
- Poor skin turgor
- Delayed capillary refill
- Dizziness
- Confusion/changes in mental status
- Lack of tears/sweat
- Falls/difficulty walking
- Low blood pressure
- Rapid heart rate
- Abnormal labs/electrolytes

Classification of severity of dehydration in adults

	Mild	Moderate	Severe
Subjective			
General state	Alert, active, up and about	Weak, lethargic, able to sit and walk	Dull, inactive, unable to sit or walk
Ability to perform daily activities	Able without difficulties	Able with some difficuty	Unable, stays in bed or needs hospitalization
Thirst	Not increased	Increased	Feels very thirsty
Objective			
Pulse	Normal	Tachycardia	Tachycardia
Bp	Normal	Normal or ↓10-20 mmHg systolic	↓>20 mmHg systolic
Postural hypotension	-ve	±	+ve
Jugular venous pressure	Normal	Normal or slightly flat	Flat
Dry mucosa (mouth, tongue)	No	Slight	Severe
Skin turgor	Good	Fair	Poor
Sunken eye balls	No	Minimal	Sunken
Body weight loss	<5%	5-10%	>10%

Diagnostic tests

▶ Fecal leucocytes determination to differentiate inflammatory from non inflammatory cause. Stool smear is prepared and stained with Methylene blue. The presence of 3 or more PMNLs /HPF in 4 or more fields is considered positive.

- Stool culture for enteric pathogens.
- Stool examination for parasites.
- C. difficile toxin in stools
  - Endoscopy: Usually not needed but may be useful in patients with signs and symptoms of proctitis (rectal pain, tenesmus and discharge).
  - Pseudomembrane is highly suggestive of C. difficile infection.
  - It may help in the diagnosis of other causes of bloody diarrhea.

Therapy of Acute Diarrhea

▶ **Rehydration**:

In severe diarrhea dehydration can occur quickly especially in children. Oral rehydration with solution containing Na+, K+, Cl-, HCO3 or citrate is preferred than IV root which is kept for more severe cases.

▶ **Diet**: Avoid high fiber food, fats, milk product, Caffeine to rest the bowel.

Frequent feeding with fruit drinks, tea, soft easily digested food as soups, crackers is recommended.

Antibiotic Treatment

A) Empiric antibiotic therapy:

As the great **majority** of patients with acute infectious diarrhea have mild and self limited illness caused by viruses or non invasive bacteria, so empiric antibiotic use has limited indications

Fluoroquinolones 500 mg twice daily for 5-7 days

Trimethoprim/ sulfamethoxazole 160/800 mg twice daily

Erythromycin 250-500 mg x4 daily

Indications of empirical antibiotic in acute diarrhea

▶ Moderate to severe traveler's diarrhea to accelerate resolution of symptoms (Quinolone).

▶ For persistent or life threatening diarrheal infections as in cholera epidemics (Tetracycline).

▶ Diarrhea caused by highly infectious agents as Shigella to reduce fecal excretion and environmental contamination (Quinolone).

▶ Symptoms that continue for more than one week in immuosuppred patients, and in those who require hospitalization.

▶ In presence of signs of invasive pathogen with moderate to severe symptoms of fever, tenesmus, bloody stools and positive fecal leucocytes.
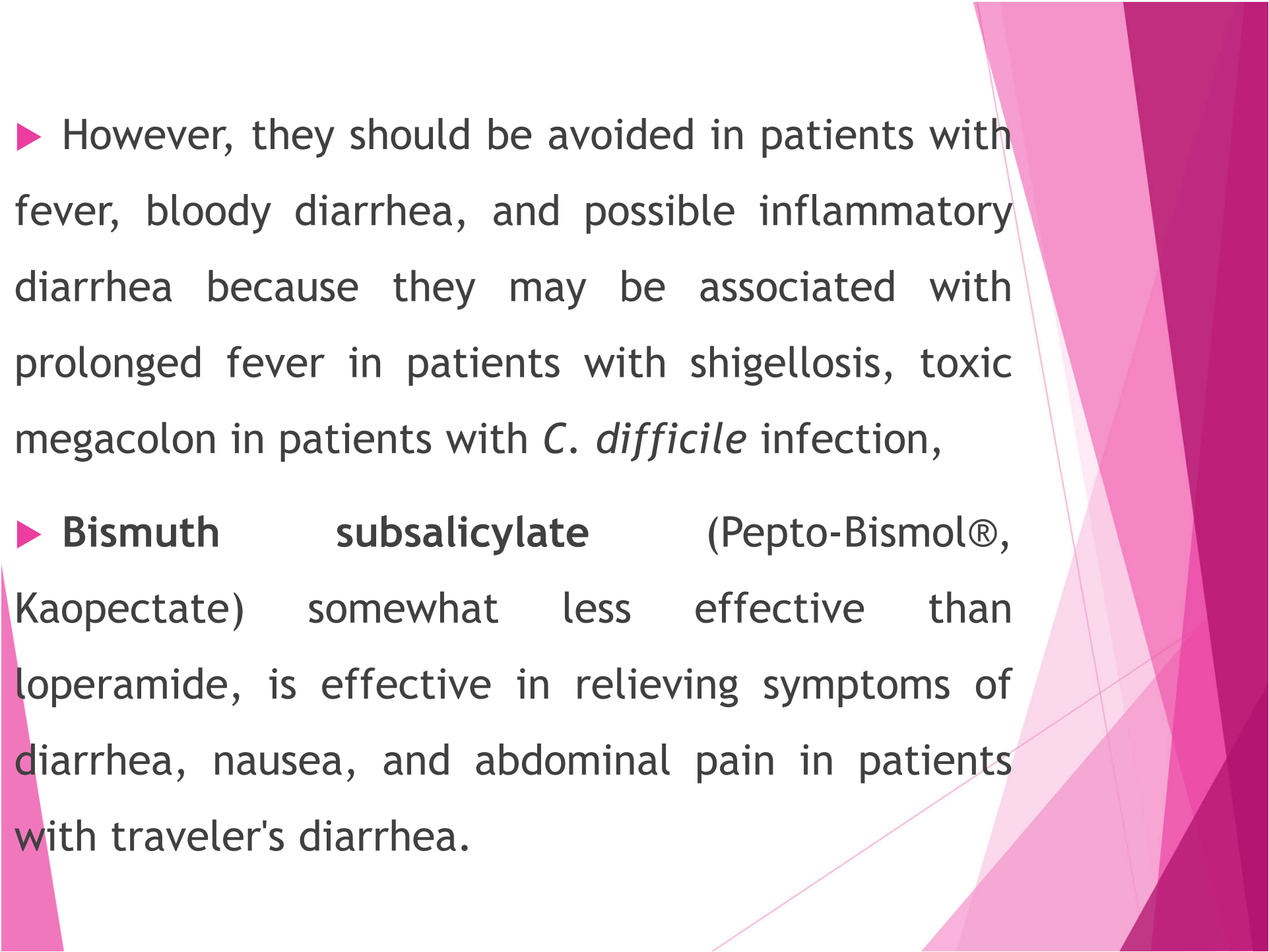
B) Specific antibiotic treatment

They are clearly recommended in treatment of

➢ Shigellosis→ Ciprofloxacin

➢ Cholera → Tetracycline

➢ Extra intestinal salmonellosis →3rd generation Cephalosporin, fluroquinolone

➢ *C. difficile* →Metronidazole or Vancomycin

➢ Giardiasis →Metronidazole

➢ *Entamoeba histolytica* →Metronidazole …….

Antidiarrheal Agents:

▶ These can be useful for the amelioration of symptoms. The most effective agents are the opioid derivatives—Loperamide (Imodium), Diphenoxylate (Lomotil) and tincture of opium.

▶ These agents inhibit intestinal peristalsis, facilitate intestinal absorption, and have antisecretory properties.

▶ However, they should be avoided in patients with fever, bloody diarrhea, and possible inflammatory diarrhea because they may be associated with prolonged fever in patients with shigellosis, toxic megacolon in patients with *C. difficile* infection,

▶ **Bismuth subsalicylate** (Pepto-Bismol®, Kaopectate) somewhat less effective than loperamide, is effective in relieving symptoms of diarrhea, nausea, and abdominal pain in patients with traveler's diarrhea.

Summary

- Most cases of acute diarrhea are self-limited and do not need diagnostic studies or specific therapy

- Diagnostic tests are warranted in certain circumstances

- Infectious agents are responsible for most cases of acute diarrhea.

- Prevention of dehydration is the most important therapeutic intervention

	Inflammatory Diarrhoea	Non-inflammatory Diarrhoea
Clinical Presentation	Small-volume	Large-volume
	Bloody	Watery
	Lower abdominal Pain	Upper or paraumbilical pain
	Fecal urgency, tenesmus, sometimes fever	Possible nausea or vomiting
Fecal leucocytes	Yes	No
Common causes	Shigella, Campylobacter, Salmonella, E. histolytica, Yersinia, Enteroinvasive E. coli, C. difficile	Vibrio, Giardia, Cryptosporidium, Enterotoxigenic E. coli, Rotavirus, Norwalk virus, toxigenic food poisoning
Preferential site	Colon	Small intestine

Bacillary dysentery Vs Amoebic dysentery

	Bacillary dysentery	Amoebic dysentery
Causative agent	Shigella	E. histolytica
Onset	Acute onset	Gradual onset
Prodromal features	Yes, fever and malaise	No
General condition	Ill	Good
Stool consistency	Not formed, with flecks and small clots of bright red blood and mucus	Formed stool with streaks of mucus and blood
Stool microscopy	Few bacilli, excess pus cells, sheets of macrophages and red cells	red cells, trophozoite with ingested red cells
Tenesmus	Common	Uncommon
Frequency	More frequent	Less frequent

Causes of dysentery

Bacterial causes

- Shigellosis
- Salmonellosis
- Campylobacteriosis
- *Enterohaemorrhagic E. coli (EHEC)*
- *Enteroinvasive E. coli (EIEC)*

Parasitic causes

- *Entamoeba histolytica*
- *Schistosoma mansoni*
- *Balantidium coli*
- *Trichuris trichiura*

Thank you