Differential diagnosis of diarrhea and acute abdominal pain.

Lívia Jánoskúti
V.
Definition

• Increase in daily stool weight above 200gr
• Increase in stool liquidity and frequency. (normal frequency ranges 3 times a week to 3 times a day)
• Acute - lasting less than 7-14 days
• Chronic - lasting more than 2-3 weeks
Pathophysiology

• There is an imbalance in the physiology of the small and large intestinal processes involved in the absorption of ions, organic substrates and thus water
Acute diarrhea: causes

Infectious

• Bacterial
  enterotoxic type- increased secretion  (E. coli enterotoxic, Vibrio cholerae)
  mucosa invasion- Shigella, Salmonella, Campylobacter, Yersinia

• Viral: Rota Norwalk

• Parasitic: Giardia lamblia, Entamoeba histolytica, Cryptosporidia,
  Isospora belli, Blastocystis hominis

• Worms: Ascaris, Strongyloides stercoralis, Ancylostoma duodenale
  Trichuris trichiura

Not infectious: drugs (Ab associated, laxatives, food allergies, or
  intolerance, chemotherapy, radiation therapy induced, ischaemic colitis etc)
Infectious diarrhea

- Acquired by fecal-oral transmission by way of water or food, contaminated by human waste or by wild or domestic animal feces
- Inadequately purified water, improperly cooked beef, pork, poultry, seafood, vegetables, dairy foods
Risk factors

• Swimming pools, campings
• Travel history (Enterotoxic E coli)
• Food history: raw or contaminated food
• Hospitalisation, antibiotic adminstration (Clostr. difficile)
• Daycare: organisms spread quickly (rotavirus, calicivirus, Campylobact, Shigella, Giardia, Cryptosporidium species)
• Immunocompromised states (Cryptosporidia species)
Clinical features

Symptoms: diarrhea, nausea, vomiting, abdominal pain, fever

- **Toxin** ingestion, or toxigenic infections typically have *nause and vomiting*, rarely fever and mild diffuse abdominal pain.

- **Invasive bacteria** cause severe intestinal inflammation, *high fever, abdominal pain*
# Stool characteristics and source

<table>
<thead>
<tr>
<th>Stool characteristics</th>
<th>Small bowel</th>
<th>Large bowel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>watery</td>
<td>Mucoid and/or bloody</td>
</tr>
<tr>
<td>volumen</td>
<td>large</td>
<td>small</td>
</tr>
<tr>
<td>blood</td>
<td>Never gross blood</td>
<td>Commonly gross blood</td>
</tr>
<tr>
<td>WBCs</td>
<td>&lt;5/high power f.</td>
<td>&gt;10 /hpf</td>
</tr>
<tr>
<td>Serum WBCs</td>
<td>normal</td>
<td>Leukocytosis</td>
</tr>
<tr>
<td>Organisms</td>
<td>Viral: rota, adeno, calici, astro, noro-</td>
<td>Invasive bacteria: E. coli(enterohemorrhagic)mShigella, Salmonella, Campylobacter, Yersinia, Aeromonas, Pleisiomonas</td>
</tr>
<tr>
<td></td>
<td>Enteroroxic bact: E. coli, Klebsiella, Clostridium perfringens</td>
<td>Toxic bacteria: Clostridium difficile</td>
</tr>
<tr>
<td></td>
<td>Parasites: Giardia, Cryptosporidium</td>
<td>Parasites: Entamoeba</td>
</tr>
</tbody>
</table>

- WBC: White Blood Cells
Differential diagnosis

- Any medication can cause diarrhea
- Other ingested toxins: insecticides, mushrooms, arsenic and even caffeine
- Acute diverticulitis
- Acute, bloody D: superior mesenteric arterial or venous thrombosis, ischemic or drug induced colitis, idiopathic inflammatory bowel disease (ulcerative colitis, Crohn’s disease)
Laboratory diagnosis
(even with the application of all available lab tests, 20-40% of acute D remain undiagnosed)

- In the presence of high fever, bloody diarrhea, systemic toxicity, dehydration, always culture stool for Salmonella, Shigella, Campylobacter and Yersinia.
- Look for Cl. difficile toxin in persons with episodes of D. with colitis type. May also occur without a history of AB use.
- Severe and bloody D.: bacterial culture and microscopic examination for ova and parasites.
- Bloody D. and history of ground beef ingestion: E coli enterohemorrhagic, Type 0157:HF can cause HUS.
- History of raw seafood ingestion or foreign travel – additional screening for Vibrio and Plesiomonas species.
- Certain organism (Giardia, Strongyloides, Cryptosporidium) are better diagnosed by duodenal aspiration or intestinal biopsy.
- Viral antigens can be detected by enzyme immunoassay.
- **Sigmoidoscopy are reserved for patients with bloody D., that does not improve within 10 days.**
Treatment

- Rest and fluid replacement (iv in severe dehydrated patients, especially children and elderly)
- Oral sugar-electrolyte solutions
- Loperamid, bismuth subsalicylate are safe in patients with traveller’s D, who have neither high fever nor blood or pus in the stool
- AB in bacterial D controversial, generally not necessary in mild or resolving disease, but indicated in patients with shigellosis, traveller’s D., pseudomembranous enterocolitis, cholera and parasitic diseases.
- PATIENTS SHOULD BE TREATED IF they are immuncompromised, have malignancy or abnormal heart valve or vascular or orthopedic prosthesis, have hemolytic anemia, or are extremely young or old.
<table>
<thead>
<tr>
<th>Pathogen organism</th>
<th>Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe shigellosis</td>
<td>Ciprofloxacin 500mg 2x/die for 3 days</td>
</tr>
</tbody>
</table>
| Salmonella (para)typhi and other salmonella species | 1. Ciprofloxacin 2x500mg/die for 10 days  
2. Amoxicillin 4x750mg/die for 14 days  
3. Cotrimoxazol 2x960mg/die for 14 days |
| Campylobacter | Eryhromycin or clarythromycin 4x250mg/die for 5 days |
| Yersinia | Doxycyclin 200mg, 2. day 100mg for 4 days  
Ciprofloxacin 2x500mg/die for 5 days |
| Entamoeba histolytica | 1. Tinidazol 1x2gr for 3 days  
2. Metronidazol 3x750mg/die for 5 days |
| Vibrio cholerae | Ciprofloxacin 1x1 gr  
Vibramycin 1x300mg |
| Giardia lamblia | Tinidazol 1x2gr |
| Schistosomiasis species | Praziquantel 1x40mg/kg |
| Strongyloides stercoralis | Abendazol 1x400mg for 3 days |
| Cryptosporidiosis in immunocompromised patients | Azithromycin 1x500mg for 3 days |
| Cyclosporidium, isospora belli | Co-trimoxasol 3x960mg/die for 14 days |
| Clostridium difficile | 1. Metronidazol 3x500mg/die for 7-10 days  
2. Vancomycin p os 4x125mg/die for 7-10 days |
Chronic diarrhea

Diarrhea persists for weeks or month, whether constant or intermittent, requires evaluation.

Pathophysiologic classification of chr. D:

- Secretory
- Osmotic
- Inflammatory
- Decreased absorptive surface
- Altered intestinal motility
- Factitious
## Classification of chr. diarrhea

<table>
<thead>
<tr>
<th>Type</th>
<th>Mechanism</th>
<th>Examples</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Secretory</td>
<td>Increased secretion or decreased absorption of Na and Cl</td>
<td>VIP secreting tu Zollinger-Ellison Carcinoid Bile salt enteropathy</td>
<td>Large volumen Watery, no blood, no pus Little response to fasting</td>
</tr>
<tr>
<td>2.Osmotic</td>
<td>Nonabsorbable molecules in gut</td>
<td>Lactose intolerance Malabsorption, maldigestion</td>
<td>Large volumen No blood, no pus Improve with fasting Stool may contain fat, fibers</td>
</tr>
</tbody>
</table>
## Classification of chr. diarrhea

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<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Inflammatory</td>
<td>Destruction of mucosa, impaired absorption</td>
<td>Ulcerative colitis</td>
<td>Small, frequent stool with blood and pus, fever</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crohn's disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Radiation colitis</td>
<td></td>
</tr>
<tr>
<td>4. Decreased absorptive surface</td>
<td>Impaired reabsorption of electrolytes</td>
<td>Bowel resection</td>
<td>Variable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enteric fistula</td>
<td></td>
</tr>
<tr>
<td>5. Motility</td>
<td>Increased, with decreased time for abs.</td>
<td>Hyperthyroidism</td>
<td>Variable</td>
</tr>
<tr>
<td></td>
<td>Decreased, with bacterial overgrowth</td>
<td>Scleroderma</td>
<td>Malabsorption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diabetic enteropathy</td>
<td></td>
</tr>
</tbody>
</table>
Factitious diarrhea

• Clinical features: usually women, watery diarrhea with hypokalaemia, weakness, edema
• Mechanism: self induced
• Examples: laxative abuse
• Evaluation: cautious room search
Abdominal pain/Origin

- Stretching of a hollow organ or tension in the wall of an organ
- Inflammation
- Ischemia
- Referred pain to extraabdominal sites (sympathetic pathways-spinal sensory neurons also receive input from peripheral nonpain neurons)
Abdominal pain/Patients

• Visceral-dull poorly localized
• Parietal peritoneum inflammation-intense, well localized
• Referred-superficial, inervated by the same spinal segment
<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DISEASES</th>
<th>PAIN QUALITY/ CHARACTERISTICS</th>
<th>PAIN REFERRAL</th>
<th>PAIN PROGRESSION</th>
<th>ASSOCIATED FINDINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Onset Pain Epigastric</td>
<td>Perforated duodenal ulcer</td>
<td>Severe; may have history of chronic ulcer pain</td>
<td>Back</td>
<td>Rapidly progresses over the entire abdomen</td>
<td>Abdominal guarding, free air in peritoneal cavity on x-ray</td>
</tr>
<tr>
<td></td>
<td>Acute cholecystitis</td>
<td>Colicky or steady</td>
<td>Tip of scapula</td>
<td>Pain intensity steadily increases over hours</td>
<td>Fever</td>
</tr>
<tr>
<td></td>
<td>Acute pancreatitis</td>
<td>Steady</td>
<td>Back</td>
<td>Pain localizes to right upper quadrant</td>
<td>Localized tenderness, gallstones visible on ultrasound examination, 99mTc-HIDA scan fails to visualize gallbladder</td>
</tr>
<tr>
<td></td>
<td>Small bowel obstruction</td>
<td>Cramping</td>
<td>Back</td>
<td>Peritoneal signs may appear later in severe cases</td>
<td>Nausea and vomiting, Epigastric tenderness</td>
</tr>
<tr>
<td></td>
<td>Appendicitis</td>
<td>Cramping, Steady</td>
<td>Back or groin in some cases</td>
<td>Pain localizes to right lower quadrant</td>
<td>Hyperactive bowel sounds, Nausea and vomiting, Dilated bowel loops with air-fluid levels on x-ray, Abdominal distention, Localized tenderness on abdominal and rectal examination</td>
</tr>
<tr>
<td></td>
<td>Intestinal infarction</td>
<td>Severe aching, May be diffuse</td>
<td>Back</td>
<td></td>
<td>Occult blood in feces, Decreased or absent bowel sounds, Initial examination may be unimpressive, Lactic acidosis, shock</td>
</tr>
<tr>
<td></td>
<td>Dissecting aortic aneurysm</td>
<td>Sudden, severe, Boring, tearing</td>
<td>Flank, Inguinal regions</td>
<td></td>
<td>Abdominal bruit, Abdominal mass, Palpable inflammatory mass</td>
</tr>
<tr>
<td></td>
<td>Diverticulitis</td>
<td>Steady</td>
<td>Back</td>
<td></td>
<td>Constipation, Fever, leukocytosis, Vomiting, Constipation (sometimes diarrhea), Abdominal distention, Hyperactive bowel sounds</td>
</tr>
<tr>
<td></td>
<td>Colon obstruction</td>
<td>Aching</td>
<td>Back</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Often left lower quadrant</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Crampy</td>
<td></td>
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</tbody>
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Chronic Pain: Abdominal pain/Chronic
Abdominal pain/ Management

• **Potential lethal problems**- need for prompt surgical or medical intervention
• **Rule out extraabdominal causes:**
  Thorax- pneumonia, inferior myocardial infarction
  Spine- radiculitis
  Genitalia-torsion of the testis
  Metabolic causes: uremia, diabetic ketoacidosis, porphyria, lead poisoning
  Neurogenic causes: herpes zooster, tabes dorsalis
Abdominal pain/Management

- History, associated symptoms
- Observation: restlessness, or immobile
- Palpation: tenderness-guarding, rigidity-signs of peritoneal irritation, presence of masses or incarcerated hernias
- Percussion: fluid in the abdomen, bowel distension
- Auscultation: bowel sounds
Abdominal pain/ Management

• Rectal digital examination
• Laboratory tests: Ht, wbc, differential, glucose, bilirubin, electrolytes, BUN, transaminase, amylase, lipase, urinalysis, stool for occult blood or pus
• Imaging procedures: plain films-free air, intestinal gas pattern, stones US, CT angiography
endoscopic procedures
Free abdominal air
Bowel obstruction
Acute appendicitis with stone
Gallbladder stones
Necrotizing colitis
Obstructive uropathy
Acute appendicitis US