



EMERGENCY MEDICINE CASES

The CME Audio Program Where the Experts Keep You In the Know
FREE for students, residents, paramedics and nurses

Episode 19 part 2 – Pediatric Abdominal Pain

Prepared by Dr. Lucas Chartier

GASTROENTERITIS

- Common diagnosis but may hide sinister pathology, so consider it a ***diagnosis of exclusion***
- In cases of isolated vomiting, especially if prolonged, consider alternate diagnoses: intracranial mass, meningitis, strep throat, pneumonia, myocarditis, appendicitis, UTI etc.

History:

Sick contacts (siblings, day care, travel or relatives visiting from abroad), contact with farm-products (eg, unpasteurized milk), unclean water exposure, prior episodes (if chronic or recurrent, might need out-patient work-up r/o IBD), new animals or foods

Physical examination:

Dehydration:

Highly sensitive but non-specific, with clinicians poor at differentiating the different degrees of severity and usually over-estimating dehydration leading to over-aggressive resuscitation

Only 3 findings have significant LR+: prolonged cap refill, abnormal skin turgor, tachypnea

Classification: 1. NO OR MILD DEHYDRATION: None of the features below

2. SOME DEHYDRATION: Some components of - unwell general appearance (eg, fussy, lethargic), mucous membranes dry, absence of tears, sunken eyes, prolonged capillary refill, abnormal skin turgor and tachypnea –PO rehydration indicated (safer than IV)

3. SEVERE DEHYDRATION: Most or all of the above features, with abnormal vital signs –IV or NG rehydration indicated

Investigations:

Majority of children do NOT need investigations, except for: accucheck if lethargy for hypoglycemia secondary to poor oral intake); to rule out other diagnoses - urinalysis in polyuria/polydipsia for DKA or in children with fever and prior UTIs to rule out same

Electrolyte abnormalities are usually minor and rarely impact management, however if starting IV rehydration, then electrolytes are important to monitor to avoid iatrogenic electrolyte imbalances

Indications for stool cultures: travel to endemic countries, >10 diarrhea episodes in 24hrs, >5d duration and not resolving, blood and/or mucous in stools, and unremitting fever

Hemolytic Uremic Syndrome (HUS):

Triad of microangiopathic hemolytic anemia, thrombocytopenia and renal insufficiency caused by E.coli O157:H7, leading to bacterial enteritis

Clinical features: bloody stool and abdominal pain, lethargy, low-grade fever, paleness and tachycardia due to anemia, petechiae, and tea-colored urine due to blood, periorbital edema (esp. upon waking)

HUS Pearls: the haemolytic component may present after the diarrhea has resolved; do not give antibiotics on spec if you suspect HUS because it may worsen disease

Gastroenteritis Management:

Oral vs IV Rehydration: Compared with IV rehydration, oral rehydration therapy is associated with a lower risk of complications such as electrolyte imbalances, cerebral edema, phlebitis and cellulitis; therefore oral rehydration therapy is recommended as the treatment of choice for children with acute gastro who are in the category of 'some' dehydration

Pearls for oral rehydration with Pedialyte

Pedialyte dose: 5cc if <6mo old, 10cc from 6mo old to 3yo, 15cc if >3yo q5mins, for a goal of around 30cc (1oz) per kg per hour for the first 3-4hrs; Dr. Jarvis recommends starting slower during the first 30-60min to minimize the chance of emesis

Continue to breastfeed at the same time, and add 10cc/kg/stool for diarrhea

Ondansetron (see Freedman, NEJM 2006 and Fedorowicz, Cochrane Review 2011)

Compared to placebo, oral Ondansetron (Zofran®) stops vomiting more frequently (NNT 5) and prevents IV insertion (NNT 5) – which is traumatic for both children and parents – and reduces immediate admission rates without masking serious disease or leading to worse outcomes in the long run; no change in hospitalizations at 72hrs, likely because children who have serious pathology will come back regardless

Given as single dose (repeat if vomiting within 15min, and keep patient NPO for 15 minutes before starting pedialyte, as it takes that long to be effective); Dr. Freedman suggests **no** prescription for home – no benefit shown and increases diarrhea, and if child suffers from worsening vomiting, he/she needs a formal reassessment

Do NOT use as a diagnostic tool (i.e. if a child stops vomiting with Ondansetron, it does NOT rule out alternate more sinister diagnoses such as appendicitis; use it therapeutically only)

Ondansetron may prolong QTc interval, so do not use in patients with known prolonged QTc, hypokalemia or hypomagnesemia, congenital heart disease or CHF as it may cause arrhythmias

Antibiotics are rarely required, even for bacterial gastro; consider antibiotics when child is persistently ill and is high-risk (immunocompromised, sickle cell disease, or use of corticosteroids or chemotherapy), or risk factors for C.diff are present (neonates and graduates of NICU, IBD patients, or immunosuppressed recently on antibiotics)

Gastroenteritis Discharge instructions:

Early introduction of solids in addition to fluids, with small frequent feeds limited in complex sugars (eg, fruit juices); diarrhea may increase initially, so give pedialyte in addition to food

Return to care if child has bloody stool, increasing pain or fever, is lethargic (“too sleepy”) or behaves unusually for him/her

Anti-diarrheals : Do NOT use loperamide (may cause lethargy, paralytic ileus, case reports of death), and bismuth is not recommended by our experts, but **probiotics** may be used given their relative safety (except in children with central lines, congenital heart disease or short gut, as they lead to higher infection rates) and somewhat improved outcomes (1d less of diarrhea, but only in severe cases)

INTUSSUSCEPTION

Prolapse of a segment of intestine into the lumen of an immediately adjacent part, and is the most common surgical emergency of the abdomen in children from 6mo to 6yo (peak at 18-30mo)

Classic triad of intermittent crying, bloody stools and sausage-shaped mass in the abdomen seen in <40% of cases

History:

Crying is often severe and different than usual crying, with the child dropping into fetal or knee-chest position, and behaving normally a few minutes later

2 presentations: either vomiting (sometimes due to pain, and bilious only if prolonged) ± abdominal pain in older children, or lethargy with paleness (especially in younger infants, where parents might describe the child’s condition as “all the life got sucked out of them”)

May elicit a history of recent viral illness, given that intussusception often requires a lead point such as enlarged lymph glands (eg, Peyer’s patch), Meckel’s diverticulum, or mesenteric duct remnant

Classic **currant jelly stool** (loose stool with mucous and blood) is a LATE finding and only present in 10% of cases

Physical:

The necessity of performing a rectal exam cannot be overstated, as fecal occult blood will appear before gross blood (by which time it is “too late” given that there is likely already bowel ischemia)

May feel an “empty” RLQ or a sausage-shaped mass in the RUQ just below the liver

Examination should focus on ruling out inguinal hernia, testicular torsion, midgut volvulus (80% present in first year of life, where bowel turns around ligament of Treitz and causes bilious vomiting), as well as child abuse, sepsis, meningitis, bacterial gastroenteritis, UTI (intermittent crying when the child urinates due to irritation)

Investigations and management:



Abdominal x-ray:

Used mainly to rule out other or concomitant diagnoses (bowel obstruction or perforated viscus), but may see subtle target sign in RUQ (image on right – subtle just below last rib and to side of spine), lack of air in RLQ, or crescent sign in LUQ (image on left) – only 23% of cases have these signs



Ultrasound:

Diagnostic test of choice, with sensitivity 99%

Less painful than enema, which is, however, also therapeutic

Treatment:

Air or barium enema – center-dependent; air may cause compartment syndrome in case of perforation due to high pressures, but barium may cause chemical peritonitis if it gets into the perineum

Direct to surgery in very young patients, prolonged symptoms (>15hrs), acidotic child, evidence of ongoing ischemia, gross blood per rectum getting worse, or hemodynamically unstable

CONSTIPATION

Definition as per Rome-III criteria:

≤2 stools per week for a duration of 2mo if patient >2yo and for duration of 4mo if patient <2yo, or with evidence of overflow incontinence (no stool, then diarrhea, then no stool, etc), or stools that clog toilet

Functional constipation is the most common cause of abdominal pain in children, but consider it a diagnosis of exclusion as severe underlying disease may be present

Differential diagnoses:

Hirschprung's disease: severe obstipation with overflow diarrhea and abdominal distention in non-thriving and cranky child, which may present with toxic megacolon

Cystic fibrosis and hypothyroidism: assess family history, and whether screening was performed

Others: Down syndrome, myelomeningocele or neuromuscular problems (slow to walk, walking "funny"), celiac disease (family history), child abuse

Management:

Oral medications work better when combined with enemas in the ER, but explain to the parents that it takes time to re-train the bowel (sometimes years)

Enemas: if child <2yo, use saline enema 20cc/kg, and if child >20-25kg, use adult fleet enema

At home: our experts prefer PEG 3350 (OTC Laxaday[®]) at dose of 1.5g/kg/d (rounded to the nearest ½cup of 17g) dissolved in 8ounces of juice, then titrate dose up or down for 1 soft stool per day, and with goal to slowly taper down

HIGH-YIELD ASSOCIATIONS AND PEARLS IN ABDOMINAL PAIN:

Intermittent pain with change in stools (esp. bloody) - intussusception

Bilious vomiting in neonate - malrotation of the gut

Scrotal swelling or discoloration - testicular torsion

Polyuria + Polydypsia - DKA

Recent Mononucleosis - spleen rupture

Petechial rash to buttocks and legs - HSP

Hematuria + proteinuria - HSP

Sterile pyuria - appendicitis

Glucosuria and ketonuria - DKA

Occult blood in stools - intussusception or advanced volvulus

“Adult diagnoses” such as cholecystitis, renal colic, and incarcerated hernia can also all occur in children!