emDocs

The EM Educator Series

The EM Educator Series: Why is my neonate so sick?

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Case: A 2-week-old male is brought into the ED for decreased activity, vomiting, and decreased oral intake. His vital signs reveal fever and tachycardia. He appears lethargic, his abdomen seems to be red, and he cries when you touch his abdomen.

Questions for Learners:

1. How do neonates with NEC present? What are the most common risk factors?
2. What are your considerations and the differential for the sick neonate?
3. What is the ED evaluation for suspected NEC?
4. What is the ED management for suspected NEC?

Suggested Resources:

- ✓ Articles
  - Peds EM Morsels
  - emDOCs
  - St. Emlyns Blog
  - Radiopaedia
- ✓ PubMed:
  - Emergency Medicine Clinics of North America
  - Journal of Emergency Medicine

Answers for Learners:

1. How do neonates with NEC present? What are the most common risk factors?

NEC usually develops 2-3 days following birth, with 90% developing within the first 10 days of life. The incidence is inversely proportional to gestational age, with 90% occurring in premature infants. Its overall incidence is ~1 in 1000 births but is as high as 20% in low birth weight infants (<1500 grams).

- Varies with the severity of the condition… making your job difficult once again.
    - poor feeding
    - bile stained vomitus
    - abdominal distension
    - blood-stained stools +/- explosive diarrhea
    - respiratory distress with acidosis
    - sepsis
- Early in the course, NEC presentation can be very subtle.
    - Mild abdominal distension.
    - Feeding intolerance.
    - It may be overlooked and the vomiting attributed to "over-feeding."
- As NEC progresses, the abdominal exam becomes more concerning.
    - Tenderness
    - Decreased bowel sounds.
    - Occult blood or gross blood in stool.
    - Abdominal wall erythema or induration/edema
- In its most severe form, the presentation is overt shock.
- As a rule… **ALWAYS BE WARY OF THE NEONATE WHO IS VOMITING!**
- **Bilious emesis** in a neonate, even one who appears well, deserves your concern!

Risk factors

- prematurity (50-80%)
- congenital heart disease
- perinatal asphyxia
- decreased umbilical flow in utero

2. What are your considerations and the differential for the sick neonate?

Most common causes of catastrophic illness in the neonate:

1. Sepsis
2. Ductal-dependent congenital heart disease (CHD)
3. Metabolic disturbance

Differential Diagnosis: **THE MISFITS** and **NEO SECRETS**
T: Trauma, tumor, thermal
H: Heart disease, hypovolemia, hypoxia
E: Endocrine (CAH, DM, thyroid)
M: Metabolic disturbances (electrolyte imbalance)
I: Inborn errors of metabolism

S: Seizures or CNS abnormalities
F: Formula dilution or over-concentration leading to hypo/hypernatremia
I: Intestinal catastrophe (intussusception, volvulus, NEC)
T: Toxins (including home remedies such as baking soda for burping)
S: Sepsis

N: iNborn errors of metabolism
E: Electrolyte abnormalities
O: Overdose
S: Seizures
E: Enteric emergencies
C: Cardiac abnormalities
R: Recipe (formula, additives)
E: Endocrine crisis
T: Trauma
S: Sepsis

3. What is the ED evaluation for suspected NEC?

Work-Up

- CBC
- Chem
- Sepsis evaluation
- Coags
- Stool +/- heme positive

Radiography

- Pneumatosis on XR is hallmark
- Get KUB in supine position and left lat decubitus
- US
- Pseudo-kidney sign - bowel wall with hyperechoic center and hypoechoic rim
- Assess for gas bubbles in liver and portal veins

4. What is the ED management for suspected NEC?

- NPO
- Aggressive IV hydration
- Ampicillin + gentamycin + clindamycin
- Surgery consult