Burn, Baby, Burn: Pediatric Fever

High Risk EM 2024

February 18, 2024

PEM Workshop Answer Guide

Case 1

- A 9-month-old female presents with 3 days of fever, emesis, and intermittent fussiness.
    - Tmax: 102.3
    - 2-3 episodes of nonbloody, nonbilious emesis per day
    - No congestion, rhinorrhea, coughing, diarrhea, or rash
- Not eating, but drinking liquids well with normal urine output
- Goes to daycare
- Previously healthy, fully vaccinated
- VS: BP 88/50 HR 148 RR 40 T 39.3 R O2 sat 98% on room air
- Alert tired-appearing infant in no acute distress, cries with exam but consolable, bilateral TMs clear, oropharynx clear with moist mucus membranes, lungs CTAB with normal work of breathing, abdomen soft and nontender, normal capillary refill, no rashes

Any other information you want to know?

- *History of prior infections (UTI, AOM, etc)*
- *Flu shot this year?*
- *Known exposures?*
- *Taking antipyretics? If so, dose and timing?*
- *Any prior hospitalizations?*
- *Known epidemics in the daycare?*
- *Changes to urine?*
- ***Importance of a thorough history and physical—MORESO than testing***

What's your differential diagnosis?

- *Differential*
    - *UTI* ***Slide with UTI calc***
    - *Influenza*
    - *Covid*
    - *Other viral NOS (early AGE?)*

- *Less likely croup, pneumonia (no resp complaints, focal findings, or hypoxia), bacteremia (vaccinated)*
- *Unlikely myocarditis, CNS infection, malignancy, KD, rare infections*

What testing would you like to do? How else would you like to manage her?

- *Testing & Management*
  - *UA and urine culture*
    - ***What are methods of urine collection in a 9-month-old?***
      - *Cath, bag, suprapubic aspiration, bladder stimulation*
  - *Covid test*
  - *Consider influenza (outside of treatment window) or respiratory viral panel (wouldn't change management)*
  - *No blood testing indicated at this time*
  - ***Antipyretic!***
  - *PO challenge*
- ***You hear some noise coming from the room and see angry-looking parents. "What is this nurse trying to do?!?" How do you explain/recommend a cath urinalysis to caregivers? What do you do if parents refuse?***
- ***Give these results for testing:***
  - *UA: negative for nitrite, 3+ leukocyte esterase, 1+ ketones, 25-50 WBC, 0-5 RBC, no bacteria*
  - *Influenza: negative*
  - *Covid: negative*
  - *RSV: negative*
- ***Which kids are highest risk for UTI?***
  - *Prior history/symptomatic*
  - *Circumcised < 6 mo*
  - *Uncircumcised < 12 mo*
  - *Girls < 2 years*
  - *Younger than 12 months*
  - *Fever ≥ 39 (102.2)*
  - *Fever for ≥48h*
  - *No obvious other source*

After your evaluation and management, repeat VS are BP 90/50 HR 118 RR 30 T 37.6R O2 sat 99% on room air, and the child is smiling and playful, voraciously breastfeeding. Based on her repeat exam and test results, what's your disposition plan?

- *OK for discharge home with:*
  - *Prescription for antibiotics, antipyresis*
    - *Typically cephalexin 25 mg/kg/dose TID x 7 days, but check your local antibiogram*
  - *Clear return precautions and home care instructions*

- *Pediatrician follow-up in 1-2 days*

Case 2

Now we're going to practice applying age-based evaluation and management.

Each of the following previously healthy children presents with **fever for two days** to a maximum temp of **38.7 rectal**. Each has **rhinorrhea**, intermittent **cough**, 1 episode of **emesis** yesterday, and **decreased oral intake** with **preserved urine output**.

All children have a temp of **38.3** in the ED and **tachycardia** for age. All are **well-appearing without focal findings** on exam.

After administering **antipyretics**, what would your evaluation and management be for:

1. A 16-day-old male?

TESTING

- *Blood culture, cath UA, urine culture, CSF (cell count with diff, gram stain, protein, glucose, culture)*
- *Can consider PCT or other inflammatory markers, though will not change our ED management*
- *Influenza and Covid swabs (+/- RVP—**emphasize that positive viral testing does not eliminate risk of SBI.** Proven RSV: 5-7% chance of UTI. Flu positive young infants: 2.3% assoc SBI. Enterovirus positive PCR from blood or CSF: 5.6% c concomitant UTI, 1% bacteremia.)*
- *Not incorrect to consider HSV/order PCR but not necessarily indicated*
    - *Risk factors for HSV: known or suspected exposure (only 20-30% of moms of babies with HSV have reported history of genital herpes!), cutaneous or mucosal vesicles, seizure or focal neurologic findings, irritability, CSF pleocytosis with non-bacterial profile, thrombocytopenia, transaminitis*

MANAGEMENT

- *Nasal suction PRN*
- *Consider IV fluids, though infant doesn't appear dehydrated*
- *IV antibiotics (ampicillin + gentamicin or cefotaxime; **emphasize no ceftriaxone in this age**)*
- *IV acyclovir not indicated, but not incorrect either*
- *Admit*

2. A 13-month-old female?

TESTING

- *Consider UA and UCx*
- *Influenza and Covid swabs*
    - ***Test for influenza if it's the right season and you'd treat (higher risk): under 5 (especially under 2), chronic medical condition (including asthma), American Indian/Alaska Native***

MANAGEMENT

- *Oral Challenge*
- *If UA+: cephalexin; if UA-: no antibiotics*
- *Discharge with clear return precautions, prescription antipyretics **(discuss why here)**, expected course, home care, follow-up plan*

3. A 4-month-old female?

TESTING

- *UA and UCx*
- *Covid and +/- influenza swabs*
- *No blood testing or CXR needed*

MANAGEMENT

- *Oral Challenge*
- *If UA+: cephalexin; if UA-: no antibiotics*
- *Discharge as above*

4. A 42-day-old male?

TESTING

- *Procalcitonin (or other inflammatory marker), blood culture, UA, urine culture*
- *Covid and +/- influenza PCR*

MANAGEMENT

- *Oral Challenge (no clear need for IV fluids)*
- *If IMs+: can consider LP and/or admission*
- *If IMs-: can DC if meeting DC criteria, +/- with antibiotics for UTI*
    - ***Emphasize that this is an easy admission if DC criteria not met or other concern***

5. A 7-year-old male?

TESTING

- *Consider Covid swab*
    - ***Pre-pandemic, I'd never have tested for influenza if I wasn't treating. Now, I may consider.***
    - ***Emphasize that no testing is necessary, even without a confirmed source.***

MANAGEMENT

- *Oral Challenge*

Case 3 (optional)

- A 30-month-old girl presents in February with fever, dry cough, and some mild rhinorrhea and nasal congestion for 5 days. Fever to 39.1 oral for the last 5 days, along with dry cough, scant rhinorrhea, and mild nasal congestion. Was seen by pediatrician 3 days ago and diagnosed with a cold (no testing was done at that time). + occasional mild abdominal pain.
- No otalgia, sore throat, increased work of breathing, vomiting, diarrhea, or dysuria
- Hasn't eaten much in 5 days, but is drinking water, juice, and electrolyte solution; voided 3 times in last 24 hours
- Goes to preschool
- Previously healthy, fully vaccinated

What are some other questions you might ask the caregiver?

- *More info on fever: measured fever every single day, timing of fever, associated symptoms (rigors, ulcers, etc)*
- *Malignancy ROS: weight loss, bleeding/bruising, bone/joint pain*
- *KD ROS: conjunctivitis, cracked lips, swollen extremities*
- *Flu shot this year?*

- VS: BP 85/52 HR 144 RR 30 T 39.7 oral O2 sat 98% on room air
- Tired-appearing girl in no acute distress, alert and interactive, bilateral TMs erythematous without bulging or opacification, oropharynx with mild erythema without exudates and dry lips, shotty nontender bilateral cervical lymphadenopathy, lungs clear to auscultation with normal work of breathing, abdomen soft without tenderness to palpation, diffuse blanching erythematous maculopapular exanthem on trunk and extremities, normal capillary refill, normal gait and no bony TTP

What's your differential diagnosis? What's your most likely diagnosis (if any)?

- *Viral illness, possibly influenza (most likely)*
- *Pneumonia*
- *UTI*

- *Bacteremia*
- *Osteomyelitis*
- *Atypical/incomplete KD*
- *MIS-C*
- *Malignancy (eg leukemia, lymphoma, intraabdominal (Wilms, neuroblastoma))*
- *Less likely CNS infection, myocarditis, septic arthritis based on exam*

What testing would you like to do? How else would you like to manage her?

TESTING (as in previous cases, below are suggestions only)

- *CBC (consider smear), blood culture, ESR, CRP*
- *UA and urine culture*
- *Consider viral testing (outside of treatment window, but could be helpful)*
- *Consider CXR*

MANAGEMENT

- *Acetaminophen or ibuprofen*
- *Consider IV fluids*
- *PO challenge*

After your management, she's still tired-appearing but slightly perkier, and has drunk 8 ounces of apple juice and eaten a few crackers. Her repeat vital signs are BP 85/52 HR 122 RR 26 T 38.1 oral O2 sat 98% on room air. Her tests have returned. Based on her repeat exam and test results, what're your new differential diagnosis and disposition plan?

- *Please only give results that were ordered:*
  - *CBC: 12.7 > 13.4/40 < 528, 70% neutrophils (no blasts or atypical cells)*
  - *ESR: 18 mm/hr*
  - *CRP: 3.1 mg/L*
  - *PCT: 2 ng/mL*
  - *UA: 1+ ketones, nitrite neg, leukocyte esterase neg, 0-5 WBC, 0-5 RBC, no bacteria*
  - *Influenza swab negative*
  - *Respiratory virus panel negative*
  - *CXR: perihilar peribronchial thickening consistent with viral vs inflammatory process; no infiltrate or mass*
- *New differential*
  - *More likely viral illness (or consecutive viral illnesses)*
  - *Bacteremia still possible, though less likely with normal inflammatory markers*
  - *Less likely UTI, PNA, KD, MIS-C, malignancy*
- *Disposition*
  - *Safe for discharge home with very close follow-up (1-2 days), clear return precautions,* ***good contact phone number PRN culture results***

- *Admission for observation of fever curve, monitoring culture results not unreasonable*