

REVISE Case

Title of case: 21 day old female with fever

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Learning Objectives: KAS 1-7

HPI: A 21 day old female, born at 40 weeks via spontaneous vaginal delivery, presents to the emergency department with fever since last night. The family measured a rectal temperature of tmax 102.7 °F at home. An appropriate acetaminophen dose was administered, and the patient was brought to the PCP's office in the morning. The patient was subsequently referred to the emergency department for further evaluation. Mother reports that the patient has had decreased appetite over the last 24 hours and has taken only two feeds today when she usually intakes 2 to 3 ounces every 3 hours. Mother denies vomiting, changes in stool caliber, rash, increased fussiness, or cough/congestion. There have been no ill contacts. Vaccinations are up to date. Vital signs on physical examination include rectal temperature of 38.7 °C, heart rate 185, blood pressure 75/52 and oxygen saturation of 99%. She cries with tears but is consolable and non-ill appearing.

Past Medical History: None

Past Surgical History: None

Family Hx: Unremarkable

Birth history: No complications. No NICU stay. Mom received prenatal care. Maternal Hx unremarkable, including GBS negative.

Physical Exam:

General: Appears well, alert and in NAD, taking bottle without difficulty at exam

Head: Normocephalic, without obvious abnormality, anterior fontanelle open and flat

Eyes: PERRL, conjunctivae clear

ENT: Palate intact and moist mucous membranes, no rhinorrhea

Neck: Supple, no adenopathy, no nuchal rigidity

Heart: Regular rate and rhythm, normal S1S2, no murmurs, 2+ pulses throughout, cap refill \leq 2 seconds

Lung: No respiratory distress, CTA bilaterally, no wheezes/rhonchi/rales

Abdomen: Bowel sounds present, Soft, non-tender, non-distended, no guarding, no masses, no hepatosplenomegaly

GU: normal external genitalia, no erythema, no discharge

Back: No abnormal curvature, no sacral dimple or hair tuft, dermal melanocytosis to lower back

Extremity: Moves all extremities spontaneously, no hip clicks or clunks with manipulation, FROM

Skin: Skin color, texture, turgor normal. No rashes or lesions, no petechiae

Neuro: No gross deficits and interacts appropriately for age, Moro reflex intact bilaterally

Question 1. Which of the following statements is true?

- a) Urinalysis should be obtained via bagged specimen
- b) Blood culture should be obtained only if CBC results abnormal
- c) Antimicrobial therapy should be withheld until specimen-guided therapy can be administered
- d) Urine culture results should be monitored for 48 hours
- e) CSF analysis should include WBC count, protein, glucose, Gram stain and culture

E is the correct answer. The risk of bacteremia and bacterial meningitis in infants 8-21 days of age is high and thus a full sepsis workup should be initiated. This includes a urine specimen by catheterization or suprapubic aspiration of bladder for urinalysis, blood culture, CSF for analysis (WBC count, protein, glucose, Gram stain) and CSF culture for bacteria. Urine culture should be obtained if urinalysis is positive. Antimicrobial therapy should then be initiated. A bagged specimen is not the appropriate mechanism of urine collection in this age group as it has a high likelihood for contamination. A blood culture should be as apart of initial therapy. Antimicrobial therapy should not be delayed for results of studies and should be administered promptly after attempting lumbar puncture. Urine culture results need only be monitored for 24-36 hours if results are negative.

Learning objectives KAS 1, 2, 4 and 5

Question 2. Which of the following patient attributes is the most important for the patient to undergo a full infectious work up?

- a) Duration of fever
- b) Age
- c) Birth history
- d) Height of fever
- e) Dermal melanocytosis

B is the correct Answer. As above, all infants aged 8-21 require full sepsis workup. This includes a urine specimen by catheterization or suprapubic aspiration of bladder for urinalysis and, if urinalysis result is positive, for culture; blood culture; CSF for analysis (WBC count, protein, glucose, Gram stain and culture for bacteria); and initiating antimicrobial therapy. The risk of bacteremia and bacterial meningitis in this age group is high, regardless of duration of fever, birth history, how high the fever is, and status on physical examination.

Learning objectives KAS 1-7

Question 3 Which of the following is the most appropriate antibiotic therapy if CSF findings are normal?

- a) Cephalexin and ampicillin
- b) Cefixime and gentamicin
- c) Ampicillin and gentamicin or ceftazidime
- d) Ceftazidime and gentamicin
- e) Ceftriaxone and ampicillin

C is the correct answer. Overall, for studies since the year 2000 in infants <90 days of age, Gram-negative organisms have been responsible for the majority of infections (60% to 80%). E. coli has been the most common pathogen detected with a prevalence of 70% to 90% of UTIs, 30% to 60% of bacteremia, and 15% to 30% of bacterial meningitis. Therapy with ampicillin and gentamicin or ceftazidime is superior (C). Cephalosporins such as ceftazidime provide good gram-negative coverage including for E. Coli, Klebsiella and Haemophilus influenzae as well as gram positive organisms such as Group B Streptococcus. Gentamicin also provides good coverage for most gram-negative organisms including E. Coli, Klebsiella and Haemophilus influenzae. Both gentamycin and ceftazidime do not provide any coverage for Listeria or enterococcus. Ampicillin is added to provide coverage for Listeria and also provides coverage for gram positives including enterococcus and Group B Streptococcus. Use of a local antibiogram can be helpful when available.

Learning objective KAS 4 and 5

Case conclusion:

The patient was admitted to the hospital and placed on IV Ampicillin and Gentamicin. Her full sepsis workup was overall unremarkable as her blood, CSF and urine cultures were monitored for over 24 hours and showed no bacterial growth. The patient did not have any of the risk factors for HSV and thus was not placed on empiric IV Acyclovir. She remained stable and afebrile throughout the admission and was discharged home without antibiotic therapy.

Citations:

Statement of correction for Robert H. Pantell, Kenneth B. Roberts, William G. Adams, et al.. clinical practice guideline: Evaluation and management of well-appearing febrile infants 8 to 60 days old. *pediatrics*. 2021;148(2):E2021052228. (2021). *Pediatrics*, 148(5).
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