

Title of case: 15 day old male with fever  
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Learning Objectives: KAS 1-7

HPI: A 15 day old M presents to the clinic for his two week follow up appointment. The nurses report an axillary temperature of 37.9 °C, with otherwise normal vital signs for age. Parents have not checked any recent temperatures at home as they feel the infant has been acting appropriately with occasional spit ups and gassiness. Patient is taking in 2 ounces every 2-3 hours and has normal wet diapers and stools. Parents deny any recent cough, congestion, runny nose, or diarrhea. On examination the infant is appropriately interactive with good tone and reflexes. The infant was born via vacuum assisted vaginal delivery at 41 weeks gestation and had an uncomplicated newborn course.

Pertinent ROS:

- No cough, congestion, or rhinorrhea
- No vomiting, diarrhea or otherwise foul smelling diapers
- No rashes

Birth hx: ex 41 weeks, normal spontaneous vaginal delivery, uncomplicated nursery course, GBS positive with adequate prophylaxis, no maternal fever, rupture of membrane 12 hours, all other prenatal labs negative

No PMH, PSH, Meds, or allergies

Imm: received HBV vaccine at birth

Dev: normal for age

Social hx: lives with mom, dad, and maternal grandparents

Family hx: mother with obesity and chronic hypertension, father with diabetes

Vitals: 37.9 °C (axillary), heart rate 130, 79/55, RR 40, satting at 100%

PE:

GENERAL APPEARANCE: well-nourished, well developed

HEAD: anterior fontanelle open, soft, & flat, no cranial hematomas

EYES: conjunctiva, sclera, & pupils normal; red reflexes present bilaterally

EARS: normal position & rotation; canals present

NOSE: passages patent

MOUTH: palate intact; no deformities noted

NECK: supple, no masses palpated, clavicles intact

HEART: RRR, normal S1 & S2, no m/r/g

PULSES: 2+ brachial & femoral pulses bilaterally

LUNGS: CTA bilaterally, no tachypnea/retractions

ABDOMEN: soft, non-tender, non-distended; no masses, no hepatosplenomegaly; umbilicus clean and without erythema or induration

GU MALE: uncircumcised penis, bilateral testes descended, no inguinal rash

HIPS: negative Barlow & Ortolani

EXTREMITIES: no deformities, full range of motion

SKIN: no significant lesions, no nevus simplex, no mongolian spots

BACK: no midline defects

NEURO: cries but consolable; good Moro, suck, & grasp reflexes; normal tone & strength

**Question 1.** Based on the patient's history and physical, what is the most appropriate next step?

- a. Obtain urine for urinalysis
- b. Discharge home with next day follow up because the patient appears well
- c. Transfer to the local emergency room for further work up
- d. Measure a rectal temperature**

Explanation: Febrile infants should always have their core temperatures measured with a rectal temperature. A fever is defined as a rectal temperature of  $\geq 38.0$  °C or  $\geq 100.4$  °F at home. The new febrile infant guidelines pertain specifically to infants who are well appearing, have a documented fever, had a gestational age between 37-42 weeks, are 8 - 60 days of age, and were at home after discharge from a newborn nursery or were born at home.

Learning Goal: Most appropriate way to measure a core temperature

**Question 2.** A rectal temperature is measured as 38.5 °C. You recommend further work up to the family due to the risk of an invasive bacterial infection. Which of the following ways is the most effective way for obtaining a clean urine sample in infants age 8-21 days?

- a. Clean catch
- b. Squeeze it out of the diaper
- c. In-and-out catheterization**
- d. Condom catheter

Explanation: Urine samples should either be collected by in-and-out catheterization or suprapubic aspiration of the bladder to ensure the cleanest urine sample. Other methods have high false-positive rates due to contamination. This is in contrast to infants older than 22 days, when an initial bagged sample can be considered for a urinalysis (but a catheterized sample should be obtained for a urine culture).

Learning Goal: KAS 1

**Question 3.** The family is forwarded to the local emergency room for further work up. Lab tests and parenteral antibiotics are ordered. Which of the following laboratory findings would necessitate additional consideration for herpes simplex virus infection?

- a. Anemia
- b. Hyperkalemia
- c. Elevated alanine aminotransferase levels**
- d. CSF hypoglycemia

Explanation: Laboratory findings related to Herpes Simplex Virus infection include CSF pleocytosis in the absence of a positive gram stain result, leukopenia, thrombocytopenia, or elevated alanine aminotransferase levels.

Learning Goal: KAS 5

**Question 4.** The initial lab tests come back with elevated alanine aminotransferase levels. You go back to re-examine the infant. Which of the following clinical findings would support a diagnosis of herpes simplex virus infection?

- a. Vesicles**
- b. Sniffles
- c. Blueberry muffin rash
- d. Holosystolic machine-like murmur

Explanation: Herpes Simplex Virus (HSV) should be considered when there is a maternal history of genital HSV lesions or fevers from 48 hours before to 48 hours after delivery, and in infants with vesicles, seizures, hypothermia, mucous membrane ulcers, CSF pleocytosis in the absence of a positive gram stain result, leukopenia, thrombocytopenia, or elevated alanine aminotransferase levels. Neonatal HSV infections have 3 main presentations: CNS disease with seizures and other neurologic signs, disseminated disease with acute liver injury and wide-spread cutaneous findings, and skin-eye-mouth disease with cutaneous ulcers to the skin, eyes, and mouth. Acyclovir should be initiated without delay if there is any concern for congenital HSV infection. Sniffles are associated with congenital syphilis infection. Blueberry muffin rash can be seen with numerous congenital infections but is most classically associated with rubella and cytomegalovirus. A holosystolic machine-like murmur can be heard with a patent ductus arteriosus.

Learning Goal: KAS 5

Case resolution: The patient is monitored in-house until all cultures are negative for 36 hours. The patient defervesced 24 hours into the admission, and otherwise had a good energy level and oral intake. The patient is discharged home with outpatient follow up.

Citations:

Pantell R H, Roberts K B, Adams W G, et al. Evaluation and Management of Well-Appearing Febrile Infants 8 to 60 Days Old. *Pediatrics*. 2021;148(2):e2021052228