

Location: Emergency Room.

Vital signs: Temperature 38.6C; heart rate 156/min; respirations 62 per minute; blood pressure is 75/43mm Hg; Weight 3.0 kg.

C.C: Poor feeding, and decreased responsiveness.

HPI:

The patient is a six-day-old female, brought to the Emergency Room by her mother because of difficulty arousing the baby for feedings, decreased intake and generally seeming less responsive according to the mother. Mom did not take patient's temperature. She has noticed that there are a decreased number of wet diapers from usual of around eight per day to only four since the same time the day prior to being seen. The baby shows some increased somnolence and when she is awake she seems to be more irritable. Mother notes that during breast-feeding the patient's sucking seems somewhat diminished. The patient has had no episodes of emesis or diarrhea, other than her usual loose yellow stools from breast-feeding. Mother has witnessed no cyanosis, episodes of apnea, gross hematuria, or seizure-like activity.

BIRTH HISTORY: The patient was a 3.210 kg female born at 38-weeks gestation to a G2, P2, now L2, GBS positive, Rh positive 25-year-old nonsmoking mother who was in good health throughout the pregnancy and received regular prenatal care including intrapartum antibiotics. Birth was via spontaneous vaginal delivery with labor lasting approximately 14 hours and delivery occurring without complications. The patient's Apgar scores were 9, one point taken off for color, and 10 at one and five minutes, respectively. The patient was discharged home after 48 hours with the mother. The discharge weight was 3.002 kg.

SOCIAL: The patient lives with parents and a three-year-old sibling. Father smokes in the house. There is no previous history for the mother of any illicit or IV drug use. The baby is being breast-fed on demand approximately every two to three hours for the first approximately four days of life. Each breast-feeding sitting lasting about 20 minutes. Mother reports that the baby is now feeding every three to four hours and only staying at the breast for about ten minutes before falling off to sleep. The baby did receive a hepatitis B immunization prior to discharge from the hospital.

How to approach this case?

In an infant less than one month old presenting with decreased responsiveness, the suspicion for sepsis should be high, but the differential is broad and includes trauma (e.g., shaken baby), congenital abnormalities, and parental misinterpretation.

Physical exam:

Pulse Oximetry, stat
General appearance
HEENT/neck
Heart
Lung
Abdomen
Neuro
Musculoskeletal
Skin

Results:

General: Well-developed, well-nourished white infant sleeping in her mother's arms. Pulse oximetry 91% on room air. HEENT: Normocephalic, atraumatic. Anterior fontanel is open, flat and soft. Mucous membranes are slightly dry. Pupils are equal, round and reactive to light. Red reflex is present bilaterally. Nares show mild flaring and are patent. Tympanic membranes are within normal limits. Oropharynx is clear. Neck flexion and extension are within normal and do not elicit irritability. Cardiovascular: Regular rate and rhythm without murmurs, rubs or gallops, S-1 and S-2 auscultated. Lungs are clear bilaterally. There are

mild subcostal and suprasternal retractions. Abdomen is soft, nontender, and nondistended with normoactive bowel sounds. No hepatosplenomegaly appreciated. Umbilicus is without erythema or discharge around the umbilical stump. Extremities: Pulses are 2/4 in the radial, femoral, dorsalis pedis areas. Capillary refill is between 2 and 3 seconds with no evidence of cyanosis, edema or clubbing of the extremities. GU shows normal female genitalia.

At this point in the evaluation, one has a six-day-old infant with a fever of 38.6 and some evidence of respiratory compromise with diminished peripheral O₂ saturation and tachypnea with retractions.

Orders:

Supplemental oxygen to keep saturations >94%

Place IV

CBC with differential, stat

Basic metabolic panel or chemistry panel, stat

Blood cultures, urine cultures, and, given this patient's age, CSF cultures.

CSF for protein, glucose, cell count, and Gram stain.

Chest X ray should be obtained to evaluate for pneumonia.

CRP is also useful to evaluate acute infectious processes but is nonspecific.

Results:

Chest X ray - Diffuse reticular nodular pattern bilaterally with slight hyperinflation, and a very small right pleural effusion.

CBC: White count 16, hemoglobin 13.7, hematocrit 38, platelets 221, the differential shows 68% neutrophils with 5 band neutrophils, 10% lymphocytes.

Chemistry panel shows sodium of 135, potassium 3.9, chloride 99, CO₂ 20, Bun 7, creatinine 0.3, calcium 10.1, glucose 71,

CRP elevated at 2.7.

Blood cultures were obtained and pending.

Urinalysis - Specific gravity of 1.028, 1-4 white blood cells, 0 red cells, negative nitrate, negative esterase. Urine cultures still pending.

Lumbar puncture was performed. CSF cell count, glucose and protein were within normal limits. Gram stain no organisms, no neutrophils. Culture is still pending.

Order:

Admit to floor

Continuous cardiorespiratory monitoring.

Vitals signs q4

Diet no oral if respiratory rate is greater than 60

IVF D5 j NS at maintenance rate

Ampicillin 100 mg/kg/day divided q 8 hr

Cefotaxime 150 mg/kg/day divided q 8 hr

Inputs/outputs

CBC with diff, BMP q daily

Results:

Blood culture grows out gram-positive cocci in chains. (The likelihood of Group B strep infection is very high.)

Order:

Continue monitoring.

Examine the patient for every 2 to 4 hours until you see some improvement, then every 8 to 12 hours

Change diet to po when respiratory rate is < 60 and no significant respiratory distress.

Wean oxygen for saturations >94%

Results:

Patient's oxygenation improves and she's weaned to room air.

Respiratory rate normalizes; work of breathing normalizes.

Patient tolerates po and maintains hydration status.

Blood culture-group B strep. Sensitive to amoxicillin.

Order:

Discharge home

Change antibiotic to amoxicillin 50-80 mg/kg/day divided q 8

Discussion:

This patient presents with signs and symptoms suggestive of a respiratory process; however, given her age and other nonspecific findings, the possibility of urinary tract or CSF infection or generalized sepsis is still in the differential and therefore one would want to begin empiric antibiotics to cover for the most likely organisms to infect this infant. For a child of this age with respiratory symptoms, the most likely etiologies are *E. coli* and Group B strep infections. Other causes of respiratory compromise with infectious etiologies include *Haemophilus influenza*, *Streptococcus pneumoniae*, Group B strep, *Listeria*, and anaerobes. For many infants, the only indication that their infection is respiratory in nature is tachypnea which may at first be missed. Oftentimes these infants do not have typical rales or sounds of consolidation on auscultation. Depending on how old the infant is, hyaline membrane disease and transient tachypnea of the newborn are differential considerations for the infant in the first 24-48 hours of life who exhibits respiratory symptoms.

Blood cultures obtained on newborns with respiratory illnesses frequently will grow out the offending organism. This patient has a risk factor for Group B strep infection because her mother was Group B strep positive. Despite the fact that the mother received intrapartum antibiotics, it is still possible for this infant to have a Group B strep infection. Likewise, for maternal histories in which the Group B strep screening is negative, it is still possible that the infant has GBS infection since screening is not 100% sensitive.

Empiric antibiotic coverage should be done as soon as possible after culture fluids are obtained. One regimen is ampicillin 100 mg/kg/d divided every 12 hours for infants who are less than 1.2 kg or every eight hours for infants who are greater than 1.2 kg and cefotaxime (Claforan) 100 mg/kg/d divided every 12 hours or 150 mg/kg/d divided every eight hours for infants who are greater than 1.2 kg and greater than seven days old. Gentamicin can be added as well or used as an alternative treatment when there is no evidence for meningitis. Infants should be treated at least ten days and possibly 14-21 days if they have a gram-negative infection.

An infant of this age with respiratory symptoms should be admitted and monitored closely for worsening respiratory compromise with decreased oxygenation and increased work of breathing. In an infant who does not respond to empiric antibiotic therapy but still has respiratory symptoms, then CMV (cytomegalovirus) pneumonia should be considered. If there is a maternal history of herpes simplex virus infection, particularly a primary infection, then that etiology should also strongly be considered and acyclovir begun.

Primary diagnosis:

Group B streptococcal pneumonia

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