If you’re preparing for the United States Medical Licensing Examination® (USMLE®) Step 1 exam, you might want to know which questions are most often missed by test-prep takers. Check out this example from Kaplan Medical, and read an expert explanation of the answer. Also check out all posts in this series.

This month’s stumper

A 7-week-old girl is brought to the physician by her mother because of a one-day history of labored breathing. Her birth was uneventful, but her mother says the infant developed conjunctivitis on the fifth day of life. Her temperature is 98.6 °F (37 °C), and her respiratory rate is 40 beats per minute. Bilateral inspiratory crackles and a slight wheeze are heard on auscultation of the chest. A chest x-ray shows bilateral interstitial infiltrates with hyperinflation. Laboratory studies show a leukocyte count of 15,000/mm3 with 40 percent eosinophils.

Which of the following is most likely to be seen on a Pap smear preparation from the mother?

A. Extracellular hyphae and yeast forms.

B. Intranuclear inclusions and multinucleated epithelial cells.

C. Large, flagellated ovoid protozoa.

D. Large, round, densely eosinophilic viral inclusions in epithelial cells.

E. Vacuoles with reticulate bodies in epithelial cells.

F. *Chlamydia trachomatis*.
The correct answer is F.

Kaplan Medical explains why

*C. trachomatis* is the most common cause of sexually transmitted genital infections in the United States. Infants who acquire *C. trachomatis* infection during vaginal birth usually present with conjunctivitis and pneumonia. This infant has symptoms consistent with neonatal pneumonia secondary to *C. trachomatis*. Infants exposed to chlamydia are usually normal at birth.

Conjunctivitis precedes the pneumonitis. Tachypnea, hypoxemia, crackles, wheezing and mild to moderate eosinophilia more than 400 cells/mm³ or more than 5 percent are evident at approximately six weeks. Patients with mild to moderate illness with chlamydia pneumonia may present with a "staccato cough" (inspiration between each single cough). Chest x-ray may show scattered infiltrates and hyperinflation of the lungs.

The differential diagnosis for neonatal conjunctivitis includes:

- Chemical conjunctivitis due to erythromycin drops (occurs in the first 24 hours).
- Neisseria conjunctivitis (occurs in the first five days).
- Chlamydia conjunctivitis (occurs three days to two weeks after birth).

Why the other answers are wrong
Choice A: Extracellular hyphae and yeast forms suggest Candida infection, which would be unlikely to cause pneumonia in a 7-week-old infant. Instead, Candida could cause skin infection or thrush.

Choice B: Intranuclear inclusions and multinucleated epithelial cells suggest herpes simplex virus 1 or 2 infection. Exposure to vesicles in the birth canal causes fever, eye and mouth infections, skin rashes, encephalitis, meningitis, and spread to internal organs (lung and liver). It is important to obtain a history and inspect the genital tract for vesicles before birth, so as to deliver the neonate via cesarean section. Occasionally, a small percentage of infected women may not have visible vesicles present in the genital tract.

Choice C: The presence of large flagellated, ovoid protozoa suggests Trichomonas vaginalis, which can cause premature rupture of membranes with premature birth, stillbirths and, occasionally, urinary tract infection or respiratory infection in the first two weeks of life.

Choice D: Large, round, densely eosinophilic viral inclusions in epithelial cells suggest molluscum contagiosum, which is a viral infection that usually affects skin but can also affect the vagina. It can be spread as a sexually transmitted disease and is occasionally spread to the neonate during delivery. The first skin lesions in the infant typically develop at about seven weeks of age.

Choice E: Many gram-negative diplococci in neutrophils suggest Neisseria gonorrhoeae, the causal organism of gonorrhea. N. gonorrhoeae can cause ophthalmia neonatorum (conjunctivitis) in this age group, but it would not be associated with pneumonia or eosinophilia.

Tips to remember

- C. trachomatis is the most common cause of sexually transmitted genital infections in the United States.
- Infants acquire C. trachomatis infection during vaginal birth can develop conjunctivitis and pneumonia.
- Neonatal conjunctivitis occurs during the first two weeks of life.
- Chlamydia pneumonia is usually seen in infants six weeks to six months old with a history of neonatal conjunctivitis.
- Chlamydia pneumonia presents with low-grade fever, tachypnea, crackles, wheezing, and eosinophilia. Chlamydia can sometimes be diagnosed on Pap smear if the characteristic vacuoles containing reticulate bodies are seen in epithelial cells.

For more prep questions on USMLE Steps 1, 2 and 3, view other posts in this series.

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