

## Endemic Mycosis: Review Questions

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### QUESTIONS

Choose the single best answer for each question.

Questions 1 and 2 refer to the following case.

A 52-year-old chicken farmer from rural Ohio with a history of AIDS is admitted to the hospital in July with a high-grade fever, malaise, chills, and dry cough. About 10 days prior to presentation, he cleaned out his chicken coops. Upon examination, he is found to have hepatosplenomegaly and a 1-cm ulcer on his hard palate. Chest radiography reveals evidence of patchy pneumonitis with hilar node enlargement.

- 1. What is this patient's most likely diagnosis?**
  - (A) Bacterial pneumonia
  - (B) *Candida* pneumonia
  - (C) Histoplasmosis
  - (D) Influenza
  - (E) Malaria
- 2. Which of the following tests will confirm this patient's diagnosis the fastest?**
  - (A) Blood culture
  - (B) Computed tomography of the chest
  - (C) Peripheral smear
  - (D) Sputum culture
  - (E) Urine test
- 3. A 39-year-old construction worker from Mississippi presents to his primary care physician with a productive cough, weight loss, and low-grade fever. The physician also notices a 2 × 3-cm ulcer on the patient's left cheek, which appears to be slightly raised and has a bed of reddish friable granulation tissue. The patient states that he first noticed the ulcer about 10 days ago and does not recall any trauma to the area. The patient should be treated with which of the following medications?**
  - (A) Cephalexin
  - (B) Ciprofloxacin
  - (C) Fluconazole
  - (D) Ketoconazole
  - (E) Linezolid
- 4. A 28-year-old woman presents to her primary care physician 2 weeks after a trip to Arizona with chief complaints of fever, bilateral knee and ankle pain (not associated with swelling), and tender, red subcutaneous nodules over her shins. Urinalysis is normal. Chest radiography is normal. A complete blood count reveals an elevated erythrocyte sedimentation rate and eosinophilia. What is this patient's most likely diagnosis?**
  - (A) Aspergillosis
  - (B) Blastomycosis
  - (C) Candidiasis
  - (D) Coccidioidomycosis
  - (E) Histoplasmosis
- 5. All of the following statements are correct EXCEPT**
  - (A) Blastomycosis often involves skin, bones, joints, and genitourinary tract
  - (B) *Histoplasma capsulatum* and *Blastomyces dermatitidis* exist as mycelial forms at room temperature and yeast forms at body temperature
  - (C) Histoplasmosis may result in mediastinal fibrosis
  - (D) Patients with early coccidioidal infections should be treated aggressively to prevent disseminated disease
  - (E) Pregnant women are at high risk for developing disseminated coccidioidomycosis

(turn page for answers)

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## ANSWERS AND EXPLANATIONS

- (C) Histoplasmosis.** The patient has acute disseminated histoplasmosis. He is an immunocompromised host with a strong exposure history. Histoplasmosis is endemic in the Ohio and Mississippi river valleys and is strongly associated with bird guano. The physical examination findings are consistent with this diagnosis, especially the presence of the palatal ulcer, which is seen in up to 20% of patients with histoplasmosis. Although bacterial pneumonia is a possibility in this patient, the exposure history and physical examination findings are more compatible with histoplasmosis. The seasonality would make influenza unlikely. The patient has no travel history to suggest malaria, and *Candida* pneumonia is an extremely uncommon diagnosis that can only be made following a lung biopsy with histopathology demonstrating candidal tissue invasion.
- (E) Urine test.** With its high sensitivity and specificity, an enzyme-linked immunosorbent assay (ELISA) test of the urine can detect *Histoplasma* antigen in up to 90% of patients with disseminated histoplasmosis.<sup>1</sup> The organism can be cultured in sputum specimens in about 20% to 60% of cases, but the cultures can take between 3 and 6 weeks to become positive if *Histoplasma* is present. Occasionally, blood cultures also will be positive in patients with disseminated histoplasmosis, especially if the lysis centrifugation technique is used. A peripheral smear would not aid in the diagnosis of histoplasmosis. Although abnormalities would be seen on computed tomography of the chest, a microbiologic diagnosis would still be needed.
- (C) Fluconazole.** This patient has blastomycosis, a fungal infection predominantly found in the southeastern/south-central United States as well as areas bordering the Ohio and Mississippi river basins and Great Lakes, with most cases reported in Mississippi, Arkansas, and Wisconsin. Exposure to soil has been identified as an important risk factor for the acquisition of this disease. Blastomycosis can involve almost any organ, but the lungs, skin, and bones are most commonly involved. The combination of lung and dermatologic involvement and occupational-related exposure to clouds of dust in this patient would make blastomycosis the most likely diagnosis. The diagnosis can be confirmed by direct visualization of the organism on a wet prep of the sputum or pus from the ulcer. Treatment for blastomycosis includes many different antifungal agents, including fluconazole, itraconazole, and amphotericin. Although ketoconazole would be effective, drug interactions and side effects make this agent a less optimal choice.
- (D) Coccidioidomycosis.** This patient has coccidioidomycosis, which is distinguishable by the classic triad of fever, arthralgias, and erythema nodosum. Eosinophilia has also been associated with coccidioidomycosis. Most of these infections are self-limited and resolve without treatment. Coccidioidomycosis is seen predominantly in arid areas of the western United States, such as California and Arizona, and thus has been termed desert rheumatism. Although histoplasmosis may cause similar symptoms, this patient's recent travel to Arizona makes coccidioidomycosis much more likely. Erythema nodosum is not commonly associated with blastomycosis. The patient's clinical presentation is not compatible with aspergillosis or candidiasis.
- (D) Patients with early coccidioidal infections should be treated aggressively to prevent disseminated disease.** Between 50% and 60% of infections due to *Coccidioides immitis* are subclinical or very mild. In the general population, pulmonary or extrapulmonary complications due to this organism are uncommon. Patients who are immunosuppressed, especially those with T-cell deficiencies (eg, patients with AIDS, organ transplant recipients, patients on high-dose corticosteroids), and pregnant women are at high risk for dissemination. Treatment of early coccidioidal infections for patients without risk factors has not been proven to be beneficial. *H. capsulatum* and *B. dermatitidis* are dimorphic fungi and exist in mycelial and yeast forms. Skin disease is the most common extrapulmonary manifestation of blastomycosis, and bone involvement with resultant osteolytic lesions is common. Between 10% and 30% of cases of blastomycosis in males involve the genitourinary tract,<sup>1</sup> and most of these patients have tender enlarged prostates with pyuria. Mediastinal fibrosis is an uncommon manifestation of histoplasmosis. Treatment for mediastinal fibrosis due to histoplasmosis involves steroids, antifungal agents, and surgery and is associated with a very poor outcome.

## REFERENCE

1. Mandell GL, Bennett JE, Dolin R. Principles and practice of infectious diseases. 6th ed. Philadelphia: Churchill Livingstone; 2005.

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