Brief Report

Multiple Pneumonias in a Man Infected with HIV

J. Kevin Carmichael, MD, and Tejal M. Parikh, MD
Tucson, Arizona

There are many pathogens responsible for pneumonia in persons infected with HIV. This case report describes a patient with pneumonias diagnosed sequentially and caused by *Pneumocystis carinii*, *Mycobacterium gordonae*, and *Coccidioides immitis*. It demonstrates the importance of pursuing a definitive or additional diagnosis in HIV-related pulmonary disease when the response to empiric therapy or to treatment of an identified pathogen is suboptimal.

Key words. HIV; pneumonia; *Pneumocystis carinii*; *mycobacterium*; *Coccidioides*. (*J Fam Pract 1993; 37:610-615*)

The lungs are a frequent site of infection in diseases related to the human immunodeficiency virus (HIV).[1] Early in HIV disease bacterial pathogens such as *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Mycobacterium tuberculosis* are common. Later in the course of HIV disease, opportunistic organisms such as *Pneumocystis carinii*, and fungi such as *Aspergillus fumigatus*, *Coccidioides immitis*, and *Histoplasma capsulatum* often involve the lungs. Although most primary care physicians are aware of the association of *P carinii* with HIV infection, concomitant infections may occur. Here we describe a patient with pneumonias, diagnosed sequentially, because of multiple pathogens. Our purpose is to illustrate some of the problems encountered in providing ambulatory care to persons infected with HIV.

Case Report

A 51-year-old man came to the clinic with complaints of fever, night sweats, and cough of 2 weeks' duration. He had moved to Tucson 6 months earlier, and this was his first visit to a physician in Arizona. He had tested positive for HIV antibodies about 2 years previously, and he reported a CD4 count of 257/μL 6 months earlier. He denied shortness of breath or dyspnea on exertion. The patient also denied any history of opportunistic infection or AIDS-defining illness. His only medication was zidovudine 100 mg five times daily. The patient was employed by a community AIDS service organization but had no health insurance.

Physical examination revealed a temperature of 38.2°C and a respiratory rate of 18 breaths per minute. Breath sounds were equal and clear, and no oral lesions were evident. The remainder of the physical examination was unremarkable.

A chest radiograph revealed a lesion in the upper lobe of the left lung, which the radiologist suggested was consistent with *Mycobacterium tuberculosis* infection (Figure 1). A purified protein derivative (PPD) skin test using candida and mumps as controls was performed. Serum serology for *C immitis* and a CD4 count were ordered. Prophylaxis against *P carinii* with oral, double-strength trimethoprim and sulfamethoxazole (TMP/SMX) one tablet three times weekly was instituted. Because the patient did not have health insurance, he was referred to the county tuberculosis (TB) clinic, where sputum samples, follow-up care, and medications could be obtained at no cost. The PPD skin test and controls and the results of the serology for *C immitis* were negative. The patient's CD4 count was 122/μL.

The county TB clinic obtained multiple sputum specimens (induced with hypertonic saline) and began antituberculosis therapy with isoniazid, rifampin, and pyrazinamide. Recent contacts were notified and encouraged to have PPD testing.

Submitted, revised, September 1, 1993.

From the Department of Family Medicine (J.K.C., T.M.P.) and the AIDS Education Programs (J.K.C.), University of Arizona College of Medicine, Tucson. Requests for reprints should be addressed to J. Kevin Carmichael, MD, AIDS Education Programs, Department of Family Medicine, University of Arizona College of Medicine, 1601 N Tucson Blvd, Suite 16, Tucson, AZ 85719.

ISSN 0094-3509

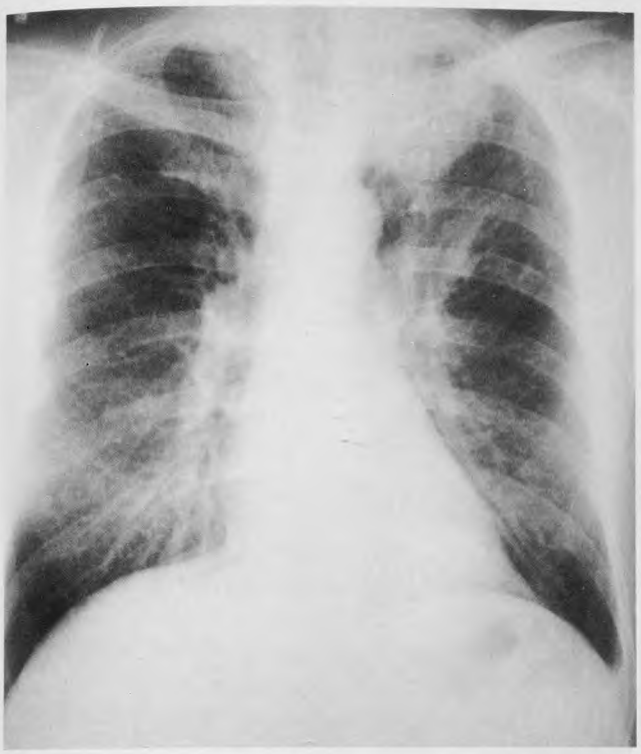

Figure 1. Chest radiograph of patient infected with HIV. Alveolar process in the apical segment of the upper lobe of the left lung with extension to the left hilum.

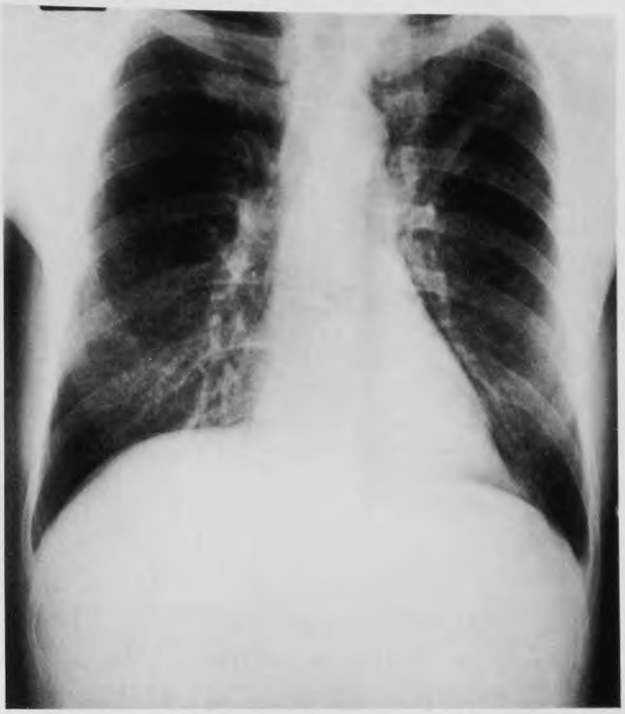

Figure 2. Chest radiograph of patient infected with HIV 1 month after initiating *M tuberculosis* treatment. Note the slight clearing of apical infiltrate. *Pneumocystis carinii* diagnosed by bronchoscopy.

Initially, the patient reported improvement; however, it was not sustained. He returned to our clinic 1 month later complaining of continuing fevers and cough and the onset of shortness of breath. A chest x-ray examination revealed minimal improvement of the upper lobe lesion in the left lung (Figure 2). Sputum collected earlier at the county TB clinic remained negative for acid-fast bacilli (AFB) in both smear and culture. Room air arterial blood gas (ABG) was as follows: pH = 7.47; Po_2 = 78; $Paco_2$ = 36; O_2% sat = 96%. Because of the patient's worsening condition and the lack of a definitive diagnosis, bronchoscopy was performed. Immunofluorescent antibody (IFA) and silver stains for *P carinii* were positive and smears for AFB were negative. Antituberculosis therapy was discontinued and the patient was placed on TMP/SMX two double-strength tablets four times daily for 21 days for treatment of *Pneumocystis carinii* pneumonia (PCP). Over the next 3 weeks the patient's condition improved markedly with resolution of the fever, night sweats, and cough. After completion of therapy, the dose of TMP/SMX was reduced to one tablet daily for secondary PCP prophylaxis.

One week after initiation of secondary PCP prophylaxis, the fevers, night sweats, and cough recurred. A chest x-ray film revealed a patchy, coarse interstitial process in the upper lobe of the left lung with an associated pleural effusion (Figure 3). At this time specimens obtained during the previous bronchoscopy were reported to be growing 20 colonies of a mycobacterium. Although the mycobacterium had not been identified, *M tuberculosis* and *Mycobacterium avium–intracellulare* complex had been ruled out. Repeat *C immitis* serology was negative. A thoracentesis and pleural biopsy were performed and revealed *C immitis* in fungal stains and subsequent culture. The patient was treated with amphotericin B intravenously at 50 mg daily for 2 weeks and then 50 mg 3 days per week (Monday, Wednesday, Friday) for a total dose of 1500 mg. Administration of TMP/SMX was continued for PCP prophylaxis. The mycobacterium was identified as *M gordonae*, and after considerable discussion and in light of an improving clinical picture, no additional therapy was begun.

At the completion of amphotericin B treatment, maintenance therapy with fluconazole 400 mg daily was initiated. The patient responded well to therapy with symptom resolution and weight gain and was able to resume working. After the completion of amphotericin B, a chest radiograph showed resolution of the effusion and interstitial infiltrate with some remaining patchy consolidation in the upper lobe of the left lung (Figure 4). *C immitis* serology obtained after completion of amphotericin was positive at a 1:8 titer. Antiretroviral ther-

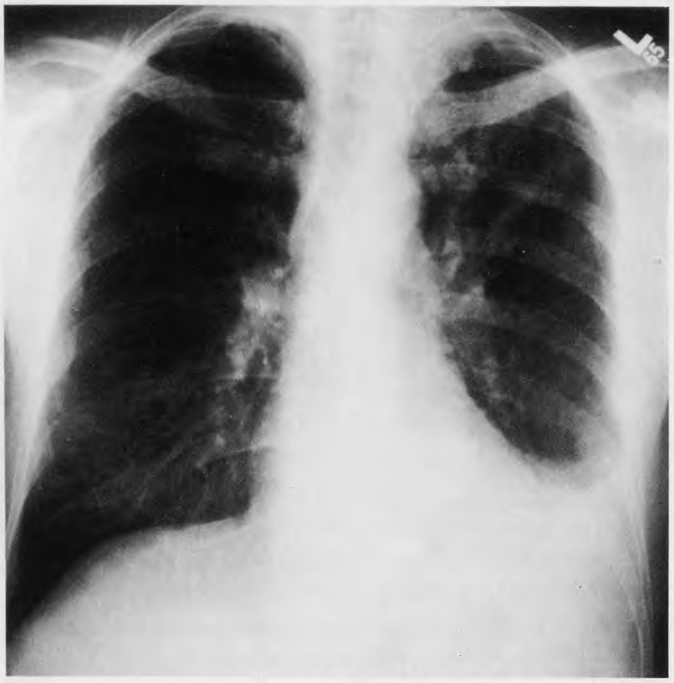

Figure 3. Chest radiograph of patient infected with HIV 2 months after initial evaluation and treatment. Note the patchy interstitial process in the upper lobe of the left lung with left pleural effusion. *Coccidioides immitis* was diagnosed on thoracentesis and pleural biopsy.

apy with didanosine was initiated and PCP prophylaxis with TMP/SMX was continued.

Discussion

PCP generally presents with fever, cough, and progressive dyspnea.[2] The characteristic appearance of PCP on the chest x-ray film is that of bilateral interstitial infiltrates.[3] PCP limited to the upper lobes is most commonly seen in patients receiving inhaled pentamidine prophylaxis.[4] A recent report by Shin et al[5] of two cases of PCP limited to the upper lobes in patients not receiving pentamidine should serve as a reminder that the differential diagnosis of abnormal findings on the chest x-ray film in the face of HIV infection must include PCP.[5] The radiologist's suggestion of *M tuberculosis*, the lack of significant dyspnea at rest or on exertion, and the patient's lack of insurance resulted in referral to the county TB clinic for definitive diagnosis and continuing care. At this clinic, sputum was sent only for AFB culture, and no studies for PCP were conducted. The finding of *P carinii* at bronchoscopy might have been expected given a CD4 count of less than 200, significant shortness of breath, and the lack of response to *M tuberculosis* therapy. The initiation of PCP prophylaxis may have contributed to the impression of some initial improvement with therapy

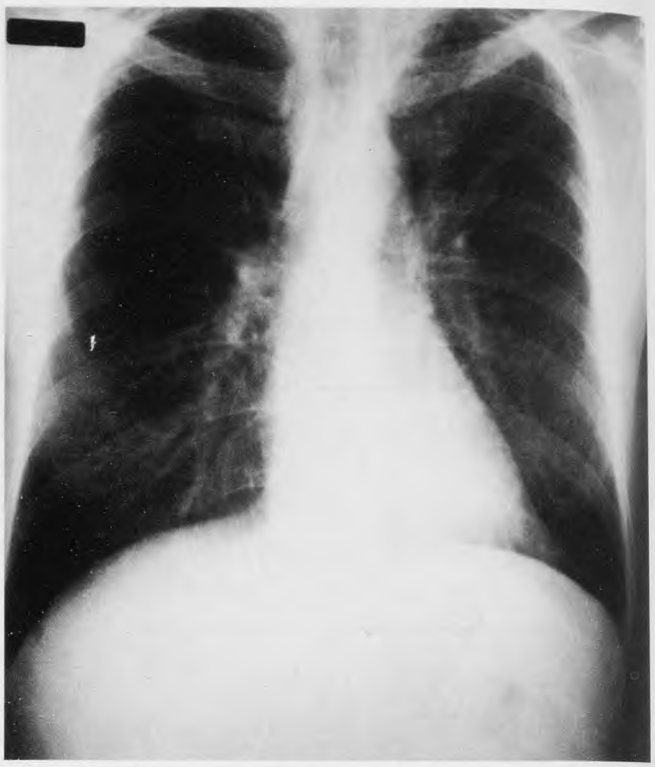

Figure 4. Chest radiograph of patient infected with HIV 5 months after initial evaluation and follow-up treatment. There is clearing of the interstitial process and pleural effusion. Continued patchy consolidation in the upper lobe of the left lung is present.

for *M tuberculosis* and may have delayed progression to a more classic clinical picture. The delayed diagnosis of PCP in this case highlights the need to pursue a definitive diagnosis of HIV-related pulmonary disease when the patient's response to therapy is suboptimal.

The patient responded to PCP therapy initially but then began to deteriorate. This deterioration was coincident with the report of an atypical mycobacterium growing from the bronchoscopy specimens. The decision to pursue additional diagnoses with thoracentesis and pleural biopsy of the left lower lobe lesion was made because of uncertainty about the significance of late growth of an atypical mycobacterium from the upper lobe bronchoscopy, the new changes seen on chest x-ray examination, and the patient's clinical deterioration.

Mycobacterium gordonae is a common mycobacterium which until the advent of AIDS was rarely considered a pathogen.[6–8] Recently there have been numerous reports of disease associated with *M gordonae*, especially in persons infected with HIV.[6,8] The identification of *C immitis*, an aggressive pathogen in persons infected with HIV, clearly explained the new clinical picture. Thus, we believed that *M gordonae* was not a pathogen in this patient.

continued on page 615

continued from page 612

Coccidioides immitis is a fungus endemic to the southwestern United States. In immunocompetent persons it generally causes only a subclinical infection. In a review of *C immitis* infections in persons infected with HIV, Fish et al[9] noted an increased incidence of severe disease with focal and diffuse pulmonary involvement being the most common patterns. It is interesting to note that serum serology for *C immitis* was negative in this patient until well into his recovery. Serology may not help with acute diagnosis because of the time required for a serologic response. This delay may be exacerbated by the immune suppression resulting from HIV infection. Serial quantitative serologic titers may be useful in monitoring progress and therapy, but as stated earlier, the immune suppression caused by HIV infection may be a confounding factor.[9]

This man was seen without charge at our clinic. The cost of his chest x-ray examinations and diagnostic laboratory studies represented a financial burden; therefore, he was referred to the county TB clinic, where all services are free. It was unfortunate that the county clinic did not send sputum samples for evaluation for other pathogens. Since this episode, the county TB clinic has agreed to send sputum samples for acid-fast bacilli and fungal studies in all patients infected with HIV in whom *M tuberculosis* is suspected, and to include PCP cytology if CD4 counts are <200 or if the physician requests it.

This patient's presentation and clinical course are illustrative of the multiple factors complicating the diagnosis and treatment of pulmonary infections in persons infected with HIV. Problems with cost of care, continuity of care, physician knowledge about the appropriate workup of pulmonary disease in persons infected with HIV, and the presence of multiple pathogens all complicated this patient's care.

Evaluation and treatment of patients infected with HIV with respiratory complaints must be guided by the degree of immune suppression (generally reflected by CD4 count) and the patient's overall clinical picture. Freedberg and colleagues[10] suggest a cost-effective approach using CD4 counts, chest radiograph findings, empiric therapy, and close patient follow-up. When evaluating a patient's response to therapy, and particularly when considering treatment failure, the possibility of multiple pathogens must be considered. Illustrative of this likelihood are the findings of Levine and Chaisson,[11] who noted that more than 50% of patients with advanced HIV infection who have *Mycobacterium kansasii* are also infected with a second pathogen.

Fortunately, these confounding factors may be overcome by close patient follow-up and a willingness to consider additional or alternative diagnoses when the response to therapy is suboptimal. By providing continuity of care, easy accessibility, and an awareness of socioeconomic and other confounding factors of illness, family physicians are uniquely able to provide quality care to persons infected with HIV.

References

1. Weinberger SE. Recent advances in pulmonary medicine. N Engl J Med 1993; 328:1462–9.
2. Leoung GS, Hopewell PC. *Pneumocystis carinii* pneumonia: clinical presentation and diagnosis. In: Cohen PT, Sande MA, Volberding PA, eds. The AIDS knowledge base. Waltham, Mass: The Medical Publishing Group, 1990; 1–6.5.2.
3. Hopewell PC. *Pneumocystis carinii* pneumonia: diagnosis. J Infect Dis 1988; 157:1115–9.
4. Rankin JA, Collman R, Daniele RP. Acquired immune deficiency syndrome and the lung. Chest 1988; 94:155–64.
5. Shin MS, Veal CF, Jessup JG, Ho KJ. Apical *Pneumocystis carinii* pneumonia in AIDS patients not receiving inhaled pentamidine prophylaxis. Chest 1991; 100:1462–4.
6. Barber TM, Craven DE, Farber HW. *Mycobacterium gordonae*: a possible opportunistic respiratory tract pathogen in patients with advanced human immunodeficiency virus, type 1 infection. Chest 1991; 100:716–20.
7. Horsburgh CR, Selik RM. The epidemiology of disseminated nontuberculous mycobacterial infection in the acquired immune deficiency syndrome (AIDS). Am Rev Respir Dis 1989; 139:4–7.
8. Weinberger M, Berg SL, Feurstein IM, Pizzo PA, Witebsky FG. Disseminated infection with *Mycobacterium gordonae*: report of a case and a critical review of the literature. Clin Infect Dis 1992; 14:1229–39.
9. Fish GD, Ampel NM, Galgiani JN, et al. Coccidioidomycosis during human immunodeficiency virus infection. Medicine 1990; 69:384–90.
10. Freedberg K, Tosteson AN, Cotton DJ, Goldman L. Optimal management strategies for HIV-infected patients who present with cough or dyspnea. J Gen Intern Med 1992; 7:261–72.
11. Levine B, Chaisson RE. *Mycobacterium kansasii*: a cause of treatable pulmonary disease associated with advanced HIV infection. Ann Intern Med 1991; 114:861–8.