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Pneumocystis Jiroveci Pneumonia and Newly Diagnosed Human Immunodeficiency Virus (AIDS) in a 63-Year-Old Woman

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Conflict of interest: None declared

Patient: Female, 63
Final Diagnosis: *Pneumocystis jirovici* pneumonia
Symptoms: Cough
Medication: —
Clinical Procedure: Bronchoscopy
Specialty: Infectious Diseases

Objective: Challenging differential diagnosis

Background: *Pneumocystis jiroveci* pneumonia (PCP) – formerly known as *Pneumocyctis carinii* pneumonia – with newly diagnosed AIDS is an uncommon presentation in people over 50 years of age. A high level of suspicion is required for this diagnosis when an elderly patient with pneumonia is not responding to broad-spectrum antibiotic treatment.

Case Report: We describe the case of a 63-year-old woman who presented with dyspnea, cough, and significant hypoxemia requiring high-flow oxygen supplement with bilateral lung infiltrates, treated with broad-spectrum antibiotics for a presumed diagnosis of pneumonia. The patient demonstrated slow clinical improvement. A diagnostic bronchoscopy with transbronchial biopsy was done, which revealed unexpected findings of Pneumocystis organisms on GMS stain. The patient tested positive for HIV and was found to have a low CD4 of 47. She was treated for *Pneumocystis jiroveci* pneumonia (PCP) and recovered accordingly.

Conclusions: It is essential to remember that HIV and the associated opportunistic infections can be very easily overlooked in the elderly. Taking a sexual history can be challenging, especially in the older population, but it should be performed. Keep in mind that aged people can get infected with HIV at an earlier stage in life and remain in latent phase for up to 15 years without specific symptoms.

MeSH Keywords: AIDS-Related Opportunistic Infections • Dyspnea • *Pneumocystis Carinii*

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Background

Based on recent statistics, it is estimated that 50% of patients living with HIV are over 50 years old. By 2020, 70% of people with HIV will be over 50 years old and the number of seniors living with HIV infection will continue to rise in future decades [1].

In the last 20 years, newly diagnosed AIDS in elderly patients has increased [2]. Older people are diagnosed at a more advanced stage of HIV infection, causing poor clinical outcome [3]. As a result, there has been a substantial number of newly diagnosed cases of HIV in the elderly, as well as a growing number of survivors with HIV due to the accessibility of more effective antiretroviral therapy (ART) and better medical management. Healthcare professionals usually do not discuss sexual practice with elderly patients, assuming that they are not active sexually, and they do not consider them at high risk for HIV infection. However, people are now staying sexually active later in life, due in part to the medications available for treatment of erectile dysfunction, and people are living longer and remaining healthier. Additionally, condom use decreases with age as pregnancy is not an issue for the elderly, who tend to underestimate their risk of acquiring HIV by practicing unprotected sex. Primary HIV infection can present with flu-like illness, and the symptoms of AIDS are nonspecific and can mimic other common illnesses in the elderly [4].

Case Report

A 63-year-old white woman with a previous medical history of HTN and DM type 2 presented to the Emergency Department with a 1-week history of dyspnea on exertion, orthopnea, and productive cough with yellow sputum. Vital signs were: temperature 98.3°F (36.8°C), blood pressure 127/76 mmhg, pulse 80 per min, and respiration 24 per min. She was found to be hypoxic with oxygen saturation of 71% on room air, requiring 6 L of oxygen per nasal cannula. Physical exam was noteworthy for coarse breath sounds bilaterally, as well as minor lower-extremity edema. EKG showed normal sinus rhythm.

Laboratory examinations showed an elevated proBNP 4056 pg/ml (normal reference ≤125 pg/ml), creatinine of 2.09 mg/dL (normal reference range 0.60–1.30 mg/dl) and WBC of 12.9 (normal reference range 4.0–10.5 10^3/UL). Urinalysis was unremarkable. Echocardiogram revealed diastolic dysfunction with reserved ejection fraction. Chest X-ray showed diffuse bilateral infiltrates and mild cardiomegaly (Figure 1). CT of the chest (Figure 2) demonstrated diffuse ground-glass opacities (GGO) and mediastinal lymphadenopathy.

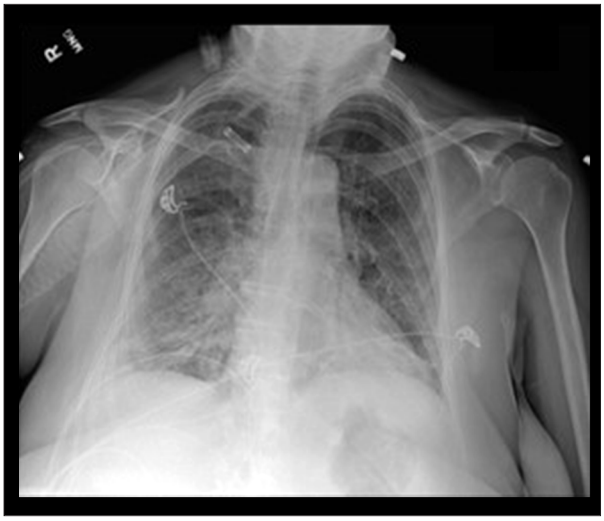

Figure 1. Chest X-ray shows diffuse bilateral infiltrates and mild cardiomegaly.

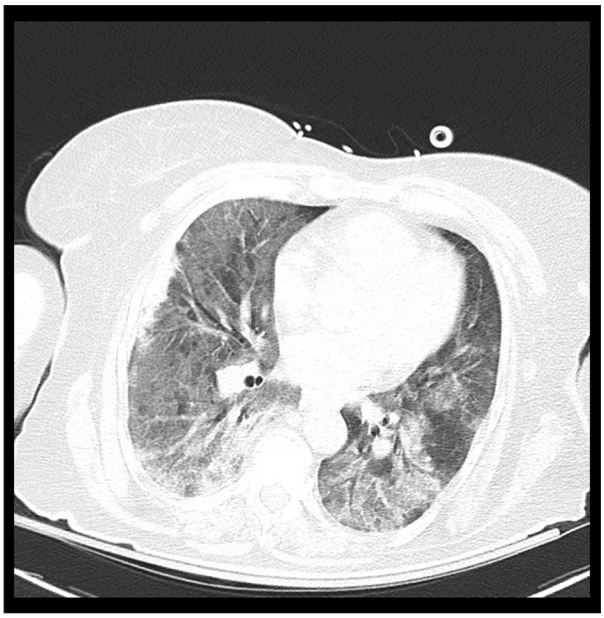

Figure 2. CT of the chest without contrast demonstrates diffuse ground-glass opacities (GGO).

The patient was at first treated with ceftriaxone and Azithromycin for presumed community-acquired pneumonia, and diuretics (Furosemide) for diastolic congestive heart failure. The viral panel showed that Mycoplasma titers, Legionella urinary antigen, Chlamydia titer, and blood culture were all negative. VQ scan (ventilation perfusion lung scan) showed a low probability of pulmonary embolism. She eventually required bilevel positive airway pressure ventilation (BIPAP) for increased work of breathing with increased oxygen requirement and was moved to the Intensive Care Unit due to acute hypoxic respiratory failure. Her antibiotics coverage was broadened to include Piperacillin/Tazobactam, Vancomycin, and Levofloxacin.

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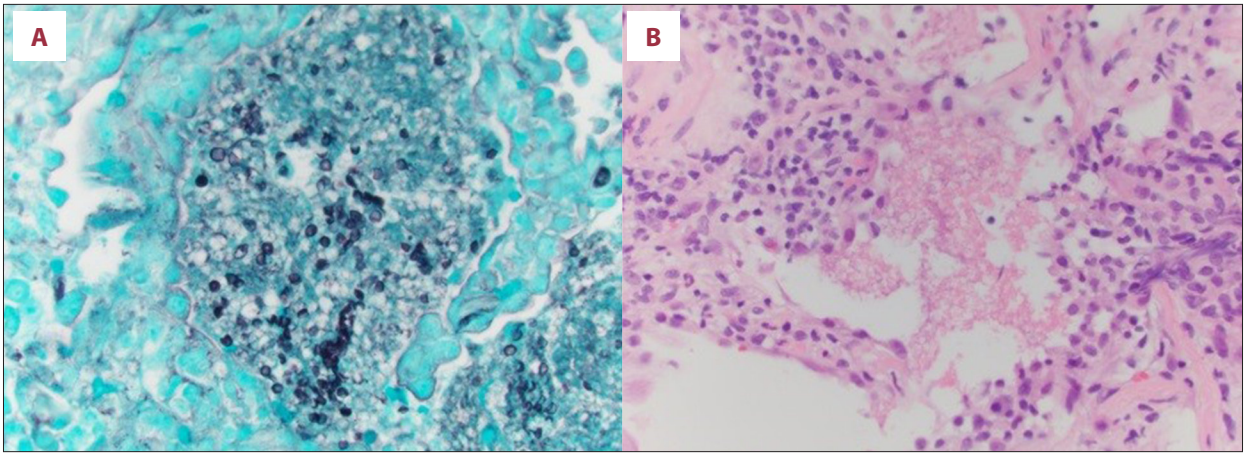

Figure 3. (**A**) GMS stain of the transbronchial biopsy showing Pneumocystis organisms. (**B**) Transbronchial biopsy showing acute and chronic inflammation with focal organization.

Serology for vasculitis and other non-infectious causes came back negative, including C-ANCA, P-ANCA, and an ANA titer of 1: 80 with a fine-speckled pattern. Given her slow clinical improvement, worsening chest X-ray findings, and negative culture, the patient underwent diagnostic bronchoscopy on the 14th day of admission to the hospital and was started empirically on steroids for possible ARDS. Transbronchial biopsy showed acute and chronic inflammation with focal organization (Figure 3B), and the GMS (Grocott-Gomori's methenamine silver stain) of the biopsy revealed Pneumocystis organisms (Figure 3A). *Pneumocystis jirovecii* was also identified on bronchial washing by GMS stain from the right lower lobe, in addition to the finding of budding yeast that grew Candida on culture. HIV antibody testing was performed the patient tested positive. The CD4 count was at 47 cells/µL (normal reference range, 365–1437 cells/µL) and viral load was very high, at 725 000 copies. On further questioning, the patient stated that she is divorced and she has not been sexually active for over 8 years. The new diagnosis was a significant shock to her and she required counseling by our psychiatry team and her family members.

The patient was started on clindamycin and primaquine due to a sulfa allergy, as well as oral prednisone. Her symptoms improved gradually and she was eventually discharged home.

Discussion

During the first decade of the acquired immunodeficiency syndrome (AIDS) epidemic, only a few cases were reported in people over age 50 [5].

This number has been increasing steadily as a result of a growing number of newly diagnosed cases of HIV in the elderly, as well as a growing number of survivors with HIV due to the availability of more effective antiretroviral therapy and better medical management [6]. Healthcare professionals usually do not discuss sexual practice with elderly patients, assuming that they are not sexually active, and they do not consider them at high risk for HIV infection [7]. However, people are now staying sexually active later in life, due in part to the medications available for treatment of erectile dysfunction, and people are also living longer and remaining healthier [8]. Additionally, condom use decreases with age, as pregnancy is not an issue for the elderly, who underestimate their risk of acquiring HIV by practicing unprotected sex [9].

Since older people are not likely to be routinely tested for HIV infection, the diagnosis of AIDS in this aged population is usually delayed, and when diagnosed, they are at a more advanced stage of HIV infection, causing poor clinical outcome and higher mortality [10]. Symptoms of AIDS can be nonspecific, such as weight loss, fatigue, cognitive impairment, and visual problems [11]. Doctors must be conscious of the age shift in the population at risk for HIV/AIDS and should consider this in the differential diagnosis in appropriate clinical scenarios when managing older patients [12].

Pneumocystis jirovecii is classified as a fungus and is transmitted by the airborne route. Up to 20% of healthy immunocompetent individuals have respiratory tract colonization with Pneumocystis and they play an important role in spreading Pneumocystis to immunocompromised people. The defensive mechanism against Pneumocystis infection involves CD4 cells, CD8 cells, neutrophils, and alveolar macrophages and mediators; however, CD4 count and viral load are the most important risk factors in developing PCP in HIV-infected patients. Most cases of PCP have a CD4 count of less than 200 cells/µL. It is the most common opportunistic infection among HIV-positive patients with low CD4 counts. Other common populations that acquire PCP include organ transplant patients, cancer patients

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(hematologic malignancies in particular), and patients on chemotherapeutic agents and immunosuppressant drugs, such as steroids, cytotoxic agents, and anti-tumor necrosis factor (TNF) drugs used for rheumatoid arthritis and other conditions. The symptoms of PCP are nonspecific and include dyspnea, dry cough, and low-grade fever. Some patients with mild PCP can even be asymptomatic [13]. Physical examination results are nonspecific as well. However, crackles are a typical finding on chest auscultation. Chest X-rays of patients infected with PCP usually show diffuse bilateral interstitial infiltrates but can also show lobar consolidations and nodules, or even appear to be normal. Chest computed tomography scans will show diffuse ground-glass opacities (GGO). Presence of the *Pneumocystis jirovecii* organism in induced sputum, broncho-alveolar lavage (BAL), or lung tissue, by staining with Gomori methenamine silver (GMS), is considered diagnostic for PCP in the appropriate setting. The diagnostic yield of GMS staining on BAL for PCP in an HIV-infected patient is over 90%, and lung biopsy for diagnosing PCP is reserved only for patients with negative BAL staining but with high clinical suspicion for PCP. New testing modalities such as polymerase chain reaction (PCR)-based assays of respiratory specimens with an elevated level of serum Beta-D-Glucan can be used to support the diagnosis of PCP, if available. *Pneumocystis jirovecii* cannot be cultured on standardized media, so staining must be performed [14].

Despite a significant decrease in PCP incidence among HIV-infected patients after the use of ART (antiretroviral therapy), physicians should keep a high clinical suspicion for PCP in all immunocompromised patients presenting with respiratory illness. Other respiratory pathogens, such as cytomegalovirus, toxoplasma, mycobacterial tuberculosis and non-mycobacterial tuberclosis, and disseminated histoplasmosis, should be considered in the differential diagnosis, and diagnostic fiberoptic bronchoscopy is recommended early in the course to avoid delayed diagnosis and therapy failure.

PCP infection is being reported more frequently in the older popluation. One of the major risk fatcotrs for aquiring PCP in non-HIV-infected patients is the short-term or intermittent use of high-dose steroids [15] and the use of low-dose methotrexat as well as other immunosuppressive therapy for treatment of reheumatoid arthritis [16]. This fact may explain the reported cases of PCP in patients with chronic obstructive pulmonary disease (COPD) using steroids over an extended period of time [17] and in patients with rehumatoid arthritis using immunosuppressive agents.

The increased risk of PCP in non-HIV-infected elderly people is most likely due to the above factors and to the normal aging process influencing immunity, in particular the quality of cellular immunity. Of note, PCP has been reported in elderly people without predisposing illnesses or risk factors [18,19].

Conclusions

It is essential to remember that HIV and the associated opportunistic infections can be very easily overlooked in the elderly. Taking a sexual history can be challenging, especially in the older population, but it should be performed. It must be remembered that aged people can get infected with HIV earlier in life and remain in latent phase for up to 15 years without specific symptoms. Doctors must be aware of the age shift in the population at risk for HIV infection.

The CDC recommends that all individuals aged 13–64 undergo HIV testing as part of regular medical care, regardless of risk factors, and persons with risk factors should be tested more frequently, at least yearly [20]. Although signed consent for HIV and pretest counseling are not requested, the test result is private in most states.

Conflict of interests

None.

References:

1. Matthew Harris C, McKenzie R, Nayak S et al: Graying of the HIV epidemic: A challenge for inpatient medicine providers. J Community Hosp Intern Med Perspect, 2015; 5(6): 29428
2. Cardoso SW, Torres TS, Santini-Oliveira M et al: Aging with HIV: A practical review. Braz J Infect Dis, 2013; 17(4): 464–79
3. Lazarus JV, Nielsen KK: HIV and people over 50 years old in Europe. HIV Med, 2010; 11(7): 479–81
4. Sanders GD, Bayoumi AM, Holodniy M, Owens DK: Cost-effectiveness of HIV screening in patients older than 55 years of age. Ann Intern Med, 2008; 148(12): 889–903
5. HIV Among People Aged 50 and Over. CDC [serial online] 2018 Feb[cited 2018 Feb 23]. Available from: URL: *https://www.cdc.gov/hiv/group/age/olderamericans/index.html*
6. Hontelez JA, de Vlas SJ, Baltussen R et al: The impact of antiretroviral treatment on the age composition of the HIV epidemic in sub-Saharan Africa. AIDS, 2012; 26(Suppl.1): S19–30
7. Schmid GP, Williams BG, Garcia-Calleja JM et al: The unexplored story of HIV and ageing. Bull World Health Organ, 2009; 87(3): 162-A
8. Mack KA, Ory MG: AIDS and older Americans at the end of the twentieth century. J Acquir Immune Defic Syndr, 2003; 33: S68–75
9. Zablotsky D, Kennedy M: Risk factors and HIV transmission to midlife and older women: Knowledge, options, and the initiation of safer sexual practices. J Acquir Immune Defic Syndr, 2003; 33: S122–30
10. Mensforth S, Goodall L, Bodasing N, Coultas J: Late diagnosis among our ageing HIV population: A cohort study. J Int AIDS Soc, 2014; 17(4 Suppl. 3):19692

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11. Grabar S, Weiss L, Costagliola D: HIV infection in older patients in the HAART era. J Antimicrob Chemother, 2005; 57(1): 4–7
12. Mpondo BC: HIV infection in the elderly: Arising challenges. J Aging Res, 2016; 2016: 2404857
13. Carmona EM, Limper AH: Update on the diagnosis and treatment of Pneumocystis pneumonia. Ther Adv Respir Dis, 2011; 5(1): 41–59
14. Tasaka S: Pneumocystis pneumonia in human immunodeficiency virus – infected adults and adolescents: Current concepts and future directions. Clin Med Insights Circ Respir Pulm Med, 2015; 9(Suppl. 1): 19–28
15. Yale SH, Limper AH: *Pneumocystis carinii* pneumonia in patients without acquired immunodeficiency syndrome: associated illnesses and prior corticosteroid therapy. Mayo Clin Proc, 1996; 71(1): 5–13
16. Wollner A, Mohle-Boetani J, Lambert RE et al: *Pneumocystis carinii* pneumonia complicating low dose methotrexate treatment for rheumatoid arthritis. Thorax, 1991; 46(3): 205–7
17. Calero-Bernal ML, Martin-Garrido I, Donazar-Ezcurra M et al: Intermittent courses of corticosteroids also present a risk for pneumocystis pneumonia in non-HIV patients. Can Respir J, 2016; 2016: 2464791
18. Jacobs JL, Libby DM, Winters RA et al: A cluster of *Pneumocystis carinii* pneumonia in adults without predisposing illnesses. N Engl J Med, 1991; 324(4): 246–50
19. Cano S, Capote F, Pereira A et al: *Pneumocystis carinii* pneumonia in patients without predisposing illnesses: Acute episode and follow-up of five cases. Chest, 1993; 104(2): 376–81
20. HIV Testing in Clinical Settings. CDC [serial online] 2018 Feb[cited 2018 Feb 23]. Available from: URL: *https://www.cdc.gov/hiv/testing/clinical/*

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