A previously healthy 83-year-old man presented to our emergency department with 3-day history of fever and dyspnea. Physical examination findings were as follows: oral temperature of 38.2°C, pulse rate of 119 beats/min, respiratory rate of 32 breaths/min, blood pressure of 108/67 mmHg and diffuse crackles over bilateral lungs. Clinical laboratory findings were as follows: white blood cell count of 10.8 × 10^3/μl with 95% neutrophils, 3.2% lymphocytes, 1.7% monocytes, hemoglobin of 9.0 g/dl and platelets of 216 × 10^3/μl. Chest radiography revealed increased interstitial marking and ground-glass opacities of both lungs (Figure 1A). The patient received oral endotracheal intubation on account of persistent dyspnea and hypoxemia.

On admission, a high-resolution computed tomography scan of the chest revealed diffuse ground-glass opacities with thickening of interlobular septa of both lungs (Figure 2). Sputum bacterial cultures were negative. Other tests for pulmonary pathogens were performed, including a tuberculosis culture, acid-fast stain, polymerase chain reaction (PCR) for *Pneumocystis jiroveci*, cytomegalovirus (CMV) and HERPES simplex virus, and blood tests for CMV and Cryptococcus antigens.

Three days later, PCR and antigens of CMV were positive in both sputum and blood. Immune status, including an human immunodeficiency virus (HIV) screening test was checked because CMV infection most commonly occurs in immunocompromised subjects. The HIV screening test and HIV western blot both revealed positive results. The CD4 lymphocyte count was 42/mm^3^ and HIV viral load was 5,902,000 copies/ml. Ganciclovir was prescribed for 3 weeks and extubation was performed 6 weeks later.

After 3-week ganciclovir treatment and 3-month highly active antiretroviral therapy, the patient underwent follow-up cell immune function tests and chest radiography examination. The CD4 lymphocyte count was 330/mm^3^ and HIV viral load was 769 copies/ml. Follow-up chest radiography revealed the resolution of increased interstitial marking and ground-glass opacities of both lungs (Figure 1B). The patient recovered well and was discharged in a stable condition.

**Discussion**

The HIV pandemic has spread to every country in the world. The prevalence of HIV-infected patients in older adults has been increasing over the last decade. Almost 10% of the HIV-infected patients are >50 years of age at the time of their diagnosis. In 2009, the American College of Physicians Guidance Statement suggested that the age range of routine voluntary HIV screening should be expanded to 75 years. Newly diagnosed HIV infection in octogenarians has been rarely reported. In the present case, HIV infection was newly diagnosed in an 83-year-old patient with acute respiratory failure. In addition to the present case, we identified three more cases of newly diagnosed HIV infection in octogenarians in a PubMed search of the English literature (Table 1).
Diagnosis of HIV infection in older patients is often delayed due to unsuspected HIV infection. Sexual contact is the main mode of HIV transmission in older patients. The CD4 cell count declines more rapidly in older patients who are infected with HIV than in younger patients. The time of progression from diagnosis of HIV infection to acquired immunodeficiency syndrome (AIDS) in older patients is shorter than it is in younger patients. The opportunistic pathogens found in older patients (e.g., P. jiroveci, CMV and Cryptococcus) are the same as those found in younger patients. However, the rate of mortality and morbidity in older patients is higher than it is in younger patients.

The most common causes of interstitial pneumonitis are exposure to environmental and occupational agents, especially to inorganic or organic agents. Connective tissue diseases with lung involvement and infectious process are also the differential diagnosis of interstitial pneumonitis. These infectious pathogens are fungus (P. jiroveci), atypical bacteria (nontuberculous mycobacterium) and viruses (CMV). These infections often develop in patients with AIDS, recipients of bone marrow or other solid organ transplants, or those who receive immunosuppressive agents or chemotherapy. Our case initially presented with acute hypoxemic respiratory failure, but image studies (chest X-ray and high-resolution computed tomography) revealed clues of interstitial pneumonitis that finally led to a diagnosis of HIV infection and possible cytomegalovirus pneumonitis, findings consistent with literature reports. Patients infected with HIV have a high risk for a variety of opportunistic infections, including P. jiroveci and CMV. Eighty-five percent of such CMV-infected patients will present with CMV retinitis as an initial manifestation. Cytomegalovirus pneumonitis as an initial manifestation of HIV infection is rare. The diagnostic criteria of CMV pneumonitis include new pulmonary infiltrates, detection of CMV using viral culture or antigen or nucleic acid studies of pulmonary secretion or lung tissue, the presence of characteristic intracellular inclusions in lung tissues and bronchoalveolar larvage and the absence of other pulmonary pathogens. To establish a definitive diagnosis of CMV pneumonitis, histologic evidence of CMV infection in lung tissue by transbronchial or open lung biopsy is usually required. Our patient did not receive a lung biopsy on account of the family’s refusal to agree to the invasive procedure. However, the patient’s

Figure 1. (A) Chest radiograph revealed increased interstitial marking, ground-glass opacities and patchy infiltration of the both lungs (obtained at our emergency department). (B) Chest radiograph revealed resolutions of these increased interstitial marking and ground-glass opacities of the both lungs (obtained 3 months after admission).

Figure 2. Computed tomography of the chest revealed diffuse ground-glass-opacities with thickening of interlobular septa of both lungs (obtained 2 days after admission).
chest radiography revealed bilateral pulmonary infiltrates and PCR of cytomegalovirus were positive in both sputum and blood samples, and other pulmonary pathogens were absent. In addition, the patient recovered well after 3-week ganciclovir treatment. So we suppose the cause of acute respiratory failure in our patient was attribute to CMV pneumonitis.

The clinical features of primary HIV infection are nonspecific and variable. The onset of the illness ranges from 1 to 6 weeks after exposure to the virus but peaks at 3 weeks. Fever, sweats, malaise, myalgias, anorexia, nausea, diarrhea and a nonexudative pharyngitis are prominent symptoms. The diagnostic criteria of primary HIV infection include clinical symptoms plus initial indeterminate detection of antibodies to HIV by western blot, indeterminate ELISA test for antibodies to HIV and HIV seroconversion within the last 6 months. Primary HIV infection could lead to opportunistic infection due to severe acute immunosuppression. The initial HIV screening test and HIV western blot of our patient were positive and primary HIV infection seems unlikely. However, primary HIV infection could not completely rule out in our patient on account of the extremely high HIV viral load, absent sequential previous HIV testing and unavailable history 6 months prior to this admission.

Interstitial pneumonitis with acute respiratory failure is not uncommon in elderly patients. The present case reminds clinical physicians that CMV pneumonitis should be considered in elderly patients with acute respiratory failure and that images can provide evidence of interstitial infiltrations. Immune status, including HIV screening should also be determined, even if >65 years, especially with those who have risky behavior, thereby avoiding a delay in HIV diagnosis and treatment.

### References


### Table 1: Newly diagnosed HIV infection in octogenarians

<table>
<thead>
<tr>
<th>Age(y)/sex</th>
<th>Way of transmission</th>
<th>Initial manifestation</th>
<th>CD4 (cells/mm³) at diagnosis</th>
<th>HIV viral load (copies/ml) at diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>81/F⁴</td>
<td>Unknown</td>
<td>Disseminated tuberculosis (pulmonary, bronchial, lymph node and urinary involvement)</td>
<td>18</td>
<td>&gt;1 000 000</td>
</tr>
<tr>
<td>83/M³</td>
<td>Heterosexual</td>
<td>Weight loss with unexplained anemia and leucopenia</td>
<td>106</td>
<td>173 000</td>
</tr>
<tr>
<td>81/M⁶</td>
<td>Bisexual transmission</td>
<td>Prostatic carcinoma</td>
<td>363</td>
<td>&gt;100 000</td>
</tr>
<tr>
<td>83/M⁶</td>
<td>Heterosexual</td>
<td>Possible CMV pneumonitis</td>
<td>42</td>
<td>5 902 000</td>
</tr>
</tbody>
</table>

aPresent case.


