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LETTER TO THE EDITOR

Do Not Forget *Pneumocystis jirovecii* Pneumonia in Non-human Immunodeficiency Virus-infected Patients

Pneumocystis jirovecii pneumonia (PJP) continues to be the major cause of opportunistic infections among human immunodeficiency virus (HIV)-infected patients;[1,2] however, in immunocompromised individuals, PJP is a common infection. We herein present the case of a patient with breast cancer who initially presented with chemotherapy-related pneumonitis. Although she received steroid therapy for pneumonitis, the patient presented with symptoms and signs of PJP intermittently, including dyspnea, cough, and fever. The patient then received empirical therapy with trimethoprim/sulfamethoxazole (TMP-SMX) for PJP, which was successfully treated.

A 43-year-old woman had a 4-month history of dry cough and shortness of breath. She received chemotherapy with the regimen of docetaxel, cyclophosphamide, pegylated liposomal doxorubicin, and fluorouracil for the right breast invasive ductal carcinoma, T2N1M0, Stage IIB, for 6 months prior to the onset of symptoms. She also received hormonal therapy with tamoxifen (10 mg/day) for 6 months. Prior to being diagnosed with breast cancer, she was working as a medical staff in a local hemodialysis center. Physical examination revealed that she had moon face, buffalo hump, and fine crackles at the bilateral lower lung fields.

A complete blood count revealed findings suggestive of leukocytosis (white cell count: 16,580 cells/mL[3], with 93% neutrophils and 4% lymphocytes). Flow cytometric analysis of the venous blood showed absolute $CD4^+$ T-cell lymphocyte count of 719 cells/mL,[3] with CD4-to-CD8 ratio of 1.438. The antibody of HIV was negative. Besides, she received several courses of chemotherapy for leukopenia. She recovered 10 days later.

Two months prior to when her symptoms worsened, computed tomography (CT) scan of the chest showed centrilobular ground-glass opacity at the right upper lung (Figure 1). One month after she completed the six courses of chemotherapy, the patient had a CT scan of the chest that showed diffuse ground-glass opacities, mainly at the bilateral lower lungs, suggesting a worsening of symptoms (Figure 2). She was diagnosed as a case of chemotherapy-related hypersensitive pneumonitis. The patient then received steroid therapy (intravenous administration of hydrocortisone 200 mg/day), following which the symptoms and image abnormalities improved dramatically. We tapered off the steroid dosage slowly after the symptoms improved.

Three weeks later, however, the symptoms of dyspnea and cough recurred, which were not relieved by steroid therapy. Another CT scan of the chest showed diffuse ground-glass opacities with alveolar opacities in bilateral lungs (Figure 2). We continued to treat the patient with intravenous methylprednisolone (80 mg/day) and empirical antibiotic therapy (intravenous administration of 750 mg/day levofloxacin). The sputum culture yielded *Citrobacter sedlakii* and we changed the antibiotic to meropenem (1 g every 8 hours intravenously). However, the patient's clinical condition worsened during this 2-week steroid therapy. During this period, she had fever with chillness, dyspnea, and hypoxemia. These symptoms and signs did not improve until TMP-SMX (240/1200 mg every 6 hours intravenously) was administered for 7 days. The TMP-SMX therapy was administered for 28 days. Once the treatment was discontinued, neither relapse nor recurrence was noted. Three weeks after the patient was discharged from hospital, a CT scan of the chest in the outpatient department showed “tree-in-bud” lesions over the right lung without ground-glass opacity. In addition, mycobacterial culture yielded nontuberculosis mycobacteria (*Mycobacterium intracellulare*). The residual tree-in-bud lesions may be due to *M. intracellulare* infection. The patient was followed up for *M. intracellulare* activity in our outpatient department.

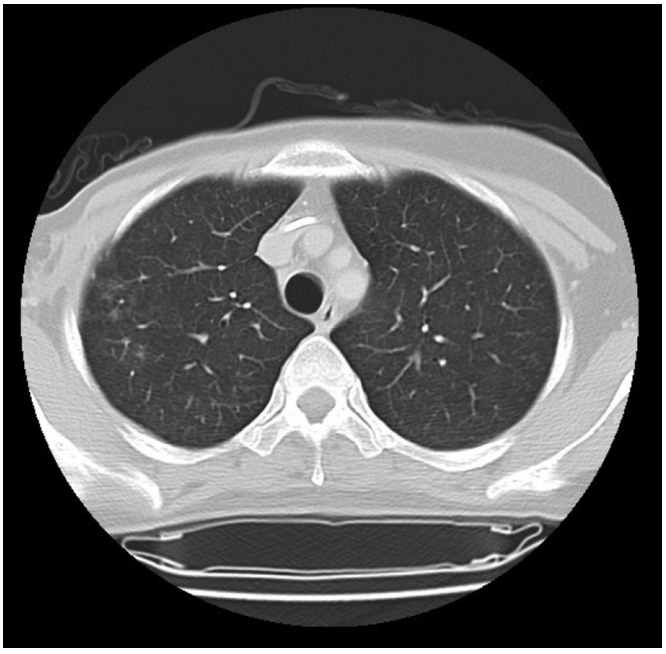

Figure 1 Centrilobular ground-glass opacity at the right upper lung after four (total 6 courses) courses of chemotherapy.

Conflicts of interest: The authors have no conflicts of interest relevant to this article.

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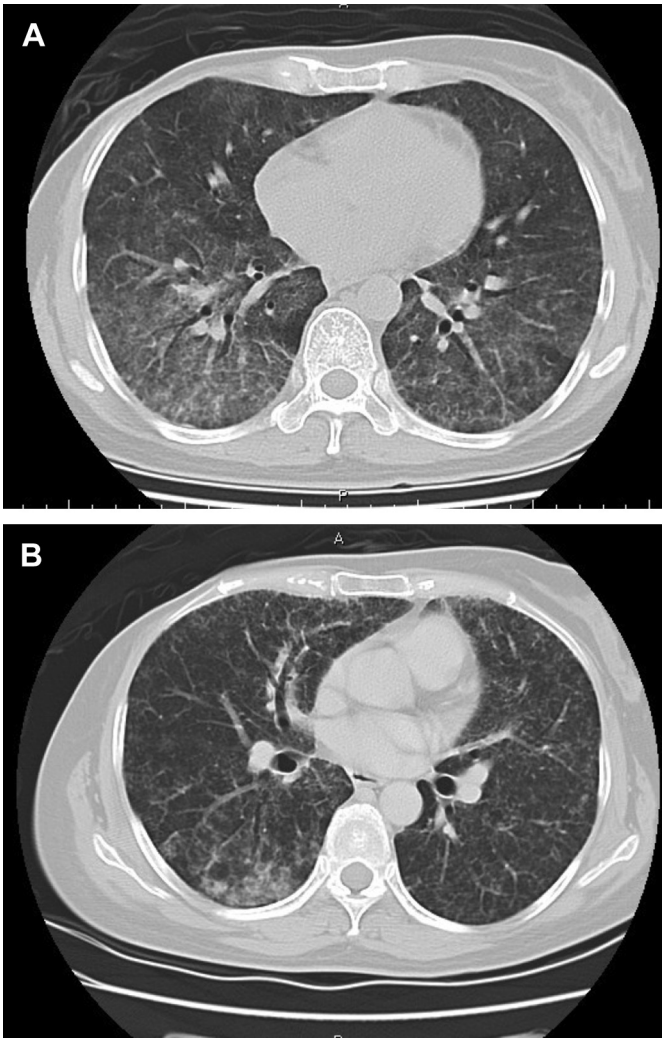

Figure 2 (A) Bilateral ground-glass opacities were found after six completed courses of chemotherapy. Hypersensitive pneumonitis was suspected and the abnormalities improved dramatically after steroid therapy. (B) As we tapered off the steroid dose, symptoms and the ground-glass opacities recurred.

Therapeutic trial in the diagnosis of pneumocystis infection may be common, especially among non-HIV-infected patients.[3] Therefore, empirical treatment with a high suspicion of pneumocystis infection of the lungs among non-HIV-infected immunocompromised hosts should be considered. However, thus far, no confirmation study in this regard was carried out. Although this opportunistic infection is usually found in HIV-infected patients, it is also seen in patients receiving immunosuppressive therapy, such as administration of more than 16 mg/day prednisolone or its equivalent with a treatment duration of more than 8 weeks.

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