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CORRESPONDENCE

Caspofungin salvage therapy in *Pneumocystis jirovecii* pneumonia

To the Editor,

Pneumocystis jirovecii pneumonia (PJP) is a severe complication and leading cause of death among human immunodeficiency virus (HIV)-infected patients.[1] Although trimethoprim/sulfamethoxazole (TMP/SMZ) is well known for its effectiveness as empiric and target therapy, it is also associated with various side effects (including skin rash, leukopenia, hepatitis, and diarrhea).[1,2] The clinical evidence of the synergistic activity of caspofungin to TMP/SMZ or salvage treatment of PJP remains controversial to date. Here, we report an HIV-infected patient complicated with PJP who had skin rash and leukopenia after TMP/SMZ treatment for 6 days. Consequently, the treatment regimen was replaced with caspofungin. The patient was discharged from the hospital in good condition after 14 days of caspofungin salvage therapy.

A 46-year-old male patient was admitted to the hospital for high fever and dyspnea, representing a fresh case of HIV infection with very low CD4 count (36/μL). His chest radiograph showed bilateral interstitial infiltration of lung fields (Figure 1A), and the computed tomography scan revealed bilateral diffuse ground-glass infiltrates (Figure 1B). A bronchoalveolar lavage specimen analyzed by Gomori methenamine silver staining revealed a cluster of *P. jirovecii* cysts. The patient was initially administered with TMP/SMZ (160/800 mg, q6h) intravenously. He received oral prednisolone (30 mg daily) as adjunctive therapy for PJP. The patient's white blood cell count decreased from 5700/mL to 3200/mL, and skin rash developed on the 7th admission day. The TMP/SMZ treatment was discontinued, and caspofungin was administered at a loading dose of 70 mg intravenously and a maintenance dosage of 50 mg daily. The patient received caspofungin therapy for a total of 14 days, and the subsequent chest X-ray (Figure 1C) demonstrated a significant improvement. The patient received HAART (highly active antiretrovirus therapy) regimen with combivir (lamivudine/zidovudine) + stocrit (efavirenz) at the time of caspofungin therapy. His CD4 count recovered to 271/μL 1 month later, therefore, he did not receive the secondary prophylaxis of PJP at discharge.

The assembly of the cell wall of *P. jirovecii* showed the presence of (1,3)-β-D-glucan in its cell wall component.[2–4] Echinocandins do not like azoles and polyenes affecting the ergosterol receptors of the cell membrane, as its antifungal activity is targeting the cell wall of PJP. In the past decade, echinocandins have proven efficacious for antifungal treatment in invasive candidiasis and aspergillosis.[5] In animal models of PJP infections, echinocandins have demonstrated prophylactic and therapeutic effectiveness.[2,3] However, caspofungin—whether it is an effective treatment for *P. jirovecii* pneumonia in immunocompromised patients without HIV infection—is also controversial.[4] Hong et al[4] reported four HIV-negative immunocompromised patients with PJP infections who received caspofungin as a salvage regimen at Asan Medical Center (Seoul, South Korea), and none of them showed a positive response. However, Tu et al[3] reported three cases of renal transplant recipients with PJP who were treated with caspofungin combined with low-dose TMP/SMZ as salvage therapy, and all exhibited a good response. Another clinical trial involving caspofungin salvage treatment of PJP in HIV-infected patients has shown a high success rate (80%, 8/10 patients).[2] These conflicting findings could be partially explained by the differences in the underlying disease of the patients, variations in the severities of PJP, and the timing of effective antimicrobial therapy.[6] Lee et al[6] reported that, based on a retrospective review of 43 immunocompromised patients (including 23 HIV-infected patients), the presence of pulmonary disease, absence of HIV infection, and a delay of anti-PJP therapy were associated with crude mortality. However, early diagnosis and early treatment of PJP and subsequent appropriate therapy would improve the outcome of PJP in HIV-infected patients. In our HIV-infected patient, the positive clinical effect of salvage therapy with caspofungin was observed; however, randomized controlled studies of caspofungin alone or

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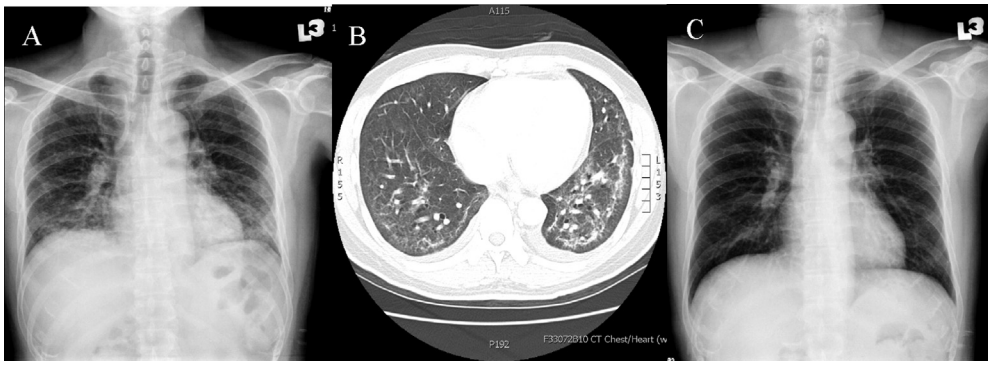

Figure 1. (A) Chest radiograph shows bilateral interstitial infiltration of lung fields. (B) Computed tomography scan exhibits bilateral diffuse ground-glass picture. (C) Follow-up chest X-ray shows improvement after caspofungin complete therapy.

combined with TMP/SMZ as salvage therapy for PJP are warranted to verify this finding.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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Wen-Sen Lee
Division of Infectious Diseases, Department of Internal Medicine, Wan Fang Medical Center, Taipei Medical University, Taipei, Taiwan

Department of Internal Medicine, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan

Po-Ren Hsueh
Department of Laboratory Medicine, National Taiwan University Hospital, Taipei, Taiwan

Department of Internal Medicine, College of Medicine, National Taiwan University Hospital, Taipei, Taiwan

Tai-Chin Hsieh
Fu-Lun Chen
Tsong-Yih Ou
Division of Infectious Diseases, Department of Internal Medicine, Wan Fang Medical Center, Taipei Medical University, Taipei, Taiwan

Department of Internal Medicine, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan

Shio-Shin Jean*
Department of Emergency, Wan Fang Medical Center, Taipei Medical University, Taipei, Taiwan

Department of Internal Medicine, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan

*Corresponding author. Number 111, Section 3, Hsing Long Road, Taipei 116, Taiwan.
E-mail address: 89425@wanfang.gov.tw (S.-S. Jean)

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