

Risk Factors for Mortality From *Pneumocystis* Pneumonia: 10-Year Experience in a Tertiary Hospital

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Background/Aims: *Pneumocystis jirovecii* pneumonia (PJP) is a life-threatening opportunistic infection in immunocompromised patients. In recent years, the use of immunosuppressive agent, such as antirejection medications and biologic cytokine inhibitors, has been increasing in various diseases. We analyzed the risk factors associated with mortality in patients with PJP.

Methods: The medical records of patients with PJP who were admitted to a tertiary hospital between January 2013 and March 2022 were retrospectively reviewed. Patients with confirmed PJP infection by positive polymerase chain reaction testing on respiratory specimens and treated for PJP were included. Initial severe PJP was defined as a room air PaO₂ <70 mmHg, an alveolar-arterial oxygen gradient ≥35 mmHg, and/or evidence of hypoxemia.

Results: A total of 95 patients with PJP were enrolled. Patients with solid tumors, hematological malignancies, and autoimmune diseases were 33 (34.7%), 15 (15.8%), and 17 (17.9%), respectively. The overall mortality from PJP was 46.3% (44/95). Of those, 40 (90.9%) had initial severe PJP and 24 (54.5%) were admitted to the intensive care unit. The overall mortality from in non-human immunodeficiency virus (HIV)-infected patients (51.2%) was higher than that in HIV-infected patients (15.4%) ($P = 0.016$). Risk factors for mortality were age greater than or equal to 65 years, severe PJP, neutropenia, invasive ventilation, and cytomegalovirus co-infection ($P < 0.05$). Underlying malignancies, PJP prophylaxis, adjunctive glucocorticoids for PJP treatment, and use of each immunosuppressive agent including chemotherapy, glucocorticoids, antirejection medications and biologic cytokine inhibitors such as tumor necrosis factor- α inhibitors were not associated with mortality.

Conclusions: Risk factors for mortality are old age (≥ 65 years), severe PJP, neutropenia, invasive ventilation, and cytomegalovirus co-infection. Underlying diseases and medical treatment were not associated with mortality.

Tables Legends

Table 1. Risk Factors for Mortality in patients with *Pneumocystis jirovecii* pneumonia

Risk factors	Adjusted OR (95% CI)	P
Age ≥ 65	3.8 (1.2–12.1)	0.027
Initial severe PJP*	9.7 (1.6–58.9)	0.013
Neutropenia**	52.7 (2.5–1090.8)	0.010
Device with ventilator	5.3 (1.4–20.2)	0.015
CMV co-infection	9.9 (1.2–83.8)	0.035
HIV infection	0.08 (0.0–0.9)	0.047

* a room air PaO₂ <70 mmHg, an alveolar-arterial oxygen gradient ≥ 35 mmHg, and/or evidence of hypoxemia (eg, room air O₂ saturation <92 percent)).

** an absolute neutrophil count of less than 500 cells/mm³.

OR = odds ratio, CI = confidence interval, PJP = *Pneumocystis jirovecii* pneumonia, CMV = cytomegalovirus, HIV = human immunodeficiency virus