Mucormycosis:
A Rare But Serious Infection

Donna M. Eichna, MSN, RN, APRN, OCN®, Kim S. Brown, RN, Andrea Breen, RN, BSN, OCN®, and Renee B. Dean, RN, BSN

Infection is among the leading causes of morbidity and mortality in patients undergoing bone marrow transplantation. Although all infections create difficulties, the most troublesome to those patients are fungal infections. Therapies used to prevent rejection and graft-versus-host disease, as well as an increase in poorly matched or unrelated donors, are believed to contribute to the increase of fungal infections. Mucormycosis, also known as zygomycosis, is an opportunistic fungal infection that is seen rarely in the clinical setting but can be found in patients who are severely neutropenic or immunosuppressed. Oncology nurses caring for bone marrow and peripheral blood stem cell transplantation recipients must know the warning signs of this deadly infection. Early detection and aggressive treatment are patients' best chances of survival.

Allogeneic bone marrow and peripheral blood stem cell transplantation are possible long-term cures for patients with hematologic malignancies, such as acute myelogenous leukemia (AML), acute lymphocytic leukemia, chronic myelogenous leukemia, myelodysplastic syndrome, and aplastic anemia. A myeloablative allogeneic transplantation requires total ablation of the bone marrow to eradicate the underlying disease and prevent rejection of the transplanted stem cells (Sutherland, 2000). The bone marrow is conditioned by administering an extremely high dose of chemotherapy and, depending on the disease, with or without total body irradiation. Without the subsequent infusion of bone marrow or peripheral blood stem cells, the patient would not produce new blood cells and would die.

This period of pancytopenia, when production of all blood cells is suppressed, generally ranges from 14–28 days depending on the source of the product (bone marrow or peripheral blood stem cells) and whether the recipient and donor are related (Williams, 2007). A broad range of antibiotics, antifungals, and antivirals are given as prophylaxis; however, even in the best of circumstances, infections will occur. Some infections are idiopathic, but they often are a resurgence of pathogens that have been quiescent in the recipient's body for years, such as varicella and cytomegalovirus (Leather & Wingard, 2001; Rupesh & Davies, 2006). Ablation of the patient's bone marrow destroys the existing immune system. Although the donor stem cells engraft and produce new blood cells (e.g., white blood cells, red blood cells, platelets), the recipient now has an immune system that must adjust and flourish in a foreign environment. This new immune system may work well, but it will never provide the same degree of immunity that the original did. After allogeneic transplantation, patients must be vigilant about exposure to and reactivation of bacteria, viruses, and fungi.

At a Glance

- Mucormycosis, although relatively uncommon in the clinical setting, can spread rapidly in severely immunocompromised patients.
- Mucormycosis rarely is reported in transplantation recipients prior to reinfusion of donor stem cells.
- Nurses should recognize the warning signs of mucormycosis because early detection and aggressive treatment are patients' best chances of survival.

Fungal infections can be troublesome for stem cell transplantation recipients. Studies show that, although *Candida* and *Aspergillus* species pose a more common risk of infection, other fungi have been identified as life-threatening to transplantation

Donna M. Eichna, MSN, RN, APRN, OCN®, is an inpatient bone marrow transplantation coordinator at Inova Fairfax Hospital in Virginia; Kim S. Brown, RN, is an infusion and research nurse and Andrea Breen, RN, BSN, OCN®, is a registered nurse II, both at Fairfax Northern Virginia Hematology Oncology; and Renee B. Dean, RN, BSN, is the oncology management coordinator at Inova Fairfax Hospital. Mention of specific products and opinions related to those products do not indicate or imply endorsement by the *Clinical Journal of Oncology Nursing* or the Oncology Nursing Society. No financial relationships to disclose. (Submitted December 2006. Accepted for publication May 10, 2007.)

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