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Immune Reconstitution: The Foundation for Safe Living After an Allogeneic Hematopoietic Stem Cell Transplantation

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With increasing frequency, oncology nurses are providing long-term care to hematopoietic stem cell transplantation (HSCT) recipients in nontransplantation settings. This may be a result of more patients receiving HSCTs, recipients living longer, and recipients' desire to return to their hometowns as soon as possible. Although critical to patients' initial recovery after HSCT, immune reconstitution also must remain a priority of oncology nursing care long beyond the date of discharge from a transplantation center. As patients resume their normal lives, oncology nurses need to be diligent in assessment and education to facilitate the ultimate goal, a safe life after HSCT. This article provides concise details about the short- and long-term immunologic effects of HSCT and focuses on the long-standing threat of opportunistic infections that can persist months and years after HSCT.

Allogeneic hematopoietic stem cell transplantation (HSCT) is a potentially curative therapy for many disorders, such as hematologic and oncologic malignancies as well as immunologic and metabolic disorders (Auletta & Lazarus, 2005; Wingard, Vogelsang, & Deeg, 2002). With the use of hematopoietic growth factors, peripheral blood stem cells, and nonmyeloablative (NM) conditioning regimens, the morbidity and mortality of allogeneic HSCT have decreased, whereas the frequency of transplantations has increased. Yet, despite the advances, dysfunctional immune reconstitution after transplantation continues to affect optimal patient outcomes.

Immune reconstitution can be defined as the recovery of antigen-specific T-cell function, production of cytokines, and cooperation with B lymphocytes in antibody productions (Alcoser & Burchett, 1999). Numerous transplant-related factors impact immune reconstitution. Immunologic recovery after transplantation occurs in three distinct phases (see Figure 1), during which the pathogens causing the most frequently occurring opportunistic infections can differ (Spitzer, Boeckh, & Nash, 2003).

Infection is the leading nonrelapse cause of mortality among allogeneic transplantation recipients (Center for International Blood and Marrow Transplant Research, 2005). Infections can and do occur at any time during the transplantation process, even when hematologic recovery has occurred but immunodeficiency still persists (Leather & Wingard, 2001).

Because oncology nursing care is needed for patients who have received allogeneic HSCT far beyond initial hospitalization, this article aims to increase awareness of the possible long-term immunodeficiency patients may have, the factors influencing the immunodeficiency, and the risk of possible infections. Nurses play an important role in patient education, identification of symptoms, and patient compliance with prophylactic medications.

At a Glance

- Oncology nurses are caring for an increasing number of hematopoietic stem cell transplantation (HSCT) recipients in community settings.
- Immune reconstitution is important throughout the transplantation continuum of care.
- Immune reconstitution is related directly to the risk of developing opportunistic infections, which are the main nondisease cause of death in recipients of HSCTs.

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