Reduced-Intensity Conditioning Allogeneic Stem Cell Transplantation in Pediatric Patients and Subsequent Supportive Care

Catherine Barrell, RN, MSN, PNP-BC, Danielle Dietzen, RN, MSN, CPNP, Zhezhen Jin, PhD, Sharon Pinchefsky, RN, MSN, CPNP, Kristen Petrillo, RN, BSN, and Prakash Satwani, MD

Myeloablative conditioning (MAC) followed by allogeneic hematopoietic stem cell transplantation (AlloHSCT) is a well-established treatment for a variety of malignant and nonmalignant diseases in children and adults (Thomas, 1983). The backbone of these regimens consists of cytotoxic high-dose chemotherapy and/or total body irradiation, which are associated with a 20%–40% incidence of transplantation-related mortality (TRM). The majority of transplantation-related deaths tend to occur in the first 100 days following MAC-AlloHSCT (Satwani et al., 2008). Along with high rates of mortality, MAC-AlloHSCT also is associated with a high incidence of acute morbidities. These regimen-related toxicities include severe mucositis (requiring opioid patient-controlled analgesia [PCA] and total parenteral nutrition [TPN]), infections, and veno-occlusive disease, all of which can require transfer to a pediatric intensive care unit (PICU) (DeLeve, Shulman, & McDonald, 2002). Avritscher, Cooksley, and Elting (2004) reported that patients with mucositis are more likely to develop infections, require PCA, and experience significant weight loss. A study by Socie et al. (1999) revealed the consequences of these toxicities when the authors reported that, although 6,691 patients achieved long-term survival two years after MAC-AlloHSCT, 375 patients died of secondary complications such as graft-versus-host disease (GVHD), infections, secondary malignancy, and organ failure 6–10 years post-treatment.

The development of nonmyeloablative conditioning was initially designed to treat patients aged 60 years and older with poor performance status, organ dysfunction, or extensive prior therapy (Barker et al., 2003). Nonmyeloablative conditioning regimens are defined...