Prevention of Dimethylsulfoxide-Related Nausea and Vomiting by Prophylactic Administration of Ondansetron for Patients Receiving Autologous Cryopreserved Peripheral Blood Stem Cells

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Autologous peripheral blood stem cell transplantation (ASCT) is used most commonly for the treatment of lymphoma and multiple myeloma, with more than 30,000 ASCTs performed worldwide in 2009 (Pasquini & Wang, 2011). ASCT requires collection and cryopreservation of autologous peripheral blood stem cells (PBSCs). Before the reinfusion of PBSCs, patients must undergo conditioning with high-dose radiation and/or chemotherapy. PBSCs typically are mobilized from patients using chemotherapy and hematopoietic growth factors such as filgrastim or granulocyte macrophage-colony-stimulating factor, or growth factors alone. Once the PBSCs have been mobilized from the bone marrow into the blood, they are collected by apheresis and then cryopreserved for reinfusion at a later time point. To protect the cells from damage associated with freezing and thawing, a cryoprotectant is required in the cryopreservation process. Common methods of cryopreservation include 10% v/v dimethylsulfoxide (DMSO), or 5% v/v DMSO with or without hydroxyethyl starch (Abrahamsen, Rusten, Bakken, & Bruserud, 2004; Kessinger & Sharp, 2003; Liseth et al., 2009; Rowley, MacLeod, Heimfeld, Holmberg, & Bensinger, 1999). PBSCs can be frozen for an extended period of time, although a maximum duration has not yet been established (Berz, McCormack, Winer, Colvin, & Quesenberry, 2007).

After mobilization chemotherapy and PBSC collection and storage, most patients are given about 30 days to recover before proceeding with the high-dose transplantation conditioning regimen. Different high-dose agents are used depending on the underlying disease and clinical setting. After completion of high-dose therapy, cryopreserved PBSCs usually are thawed rapidly at the bedside and infused without further manipulation beginning on “day 0.” Prior to the infusion, patients require IV hydration. To prevent reactions related to histamine release caused by the DMSO,