Bortezomib, a Newly Approved Proteasome Inhibitor for the Treatment of Multiple Myeloma: Nursing Implications

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Multiple myeloma (MM), a malignancy of the plasma cells, accounts for an estimated 14% of all newly diagnosed hematologic malignancies. Advances in chemotherapy and stem cell transplantation have improved survival rates, but MM remains incurable. Bortezomib (Velcade™, Millennium Pharmaceuticals, Inc., Cambridge, MA), a first-in-class proteasome inhibitor, has been approved for patients with MM who have received at least two prior treatments and have demonstrated disease progression on the most recent one. During clinical trials, most side effects were manageable with standard interventions. The most common toxicities were asthenic conditions (fatigue, malaise, and weakness), gastrointestinal disturbances (nausea, vomiting, diarrhea, and constipation), thrombocytopenia, peripheral neuropathy, pyrexia, and anemia. Supportive therapies and strategies for side-effect management can prevent worsening of these symptoms, thereby avoiding dose reductions and treatment delays. Oncology nurses play a key role in ensuring the proper and safe administration of bortezomib and often are the first to identify the signs of side effects. Patient education about anticipated side effects and close monitoring of patients can lead to symptom management interventions that are essential to patient comfort and safety.

Key Words: multiple myeloma, peripheral neuropathies, proteasome

Multiple myeloma (MM) is the second most common hematologic malignancy, with more than 15,270 newly diagnosed cases and more than 11,070 deaths in the United States estimated for the year 2004 (American Cancer Society, 2004). The disease is a cancer of the antibody-forming B cells, causing uncontrolled growth of plasma cells. The malignant plasma cells invade the bone marrow as well as many other organs in the body. Myeloma cells release into the blood massive amounts of monoclonal immunoglobulin (M protein), a dysfunctional type of antibody. The spread of myeloma cells causes a variety of complications involving the bones, blood, kidneys, and nervous and immune systems (Kyle et al., 2003). The disease frequently causes a chronic condition characterized by bone pain, low levels of blood calcium, decreasing or failing kidney function, multiple recurrent infections, bone fractures, spinal cord compression, anemia, defects in the blood clotting systems, and symptoms such as peripheral neuropathy, gastrointestinal disturbances, and abnormally decreased numbers of all types of blood cells (Rice & Sheridan, 2001).

Standard treatment has included combination chemotherapy such as melphalan and prednisone; vincristine, doxorubicin, and dexamethasone; or single-agent dexamethasone (Munshi, Tricot, & Barlogie, 2001). High-dose chemotherapy supported by autologous stem cell transplantation has extended survival in selected patients but is not an option for older patients or those with serious comorbidity or poor performance status. Conventional allogeneic transplantation and miniallogeneic transplantation are associated with high mortality (Catley & Anderson, 2004).

More recently, based on its ability to reduce the formation of new blood vessels believed to promote tumor growth, thalidomide has been used. Novel therapies currently being studied include immunomodulatory drugs, arsenic compounds, and proteasome inhibitors (Tariman, 2003).

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