



# Bortezomib-Induced Peripheral Neuropathy in Patients With Multiple Myeloma

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Bortezomib-induced peripheral neuropathy (BIPN) often is difficult to manage or reverse once it occurs. Treatment usually involves dose-reduction, interruption, or cessation of therapy, as no other interventions have been proven effective. Oncology nurses must be vigilant and recognize BIPN early to prevent patients from experiencing symptoms and complications that may interfere with their quality of life.

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Digital Object Identifier: 10.1188/12.CJON.86-89

**B**ortezomib (Velcade®) was the first approved proteasome inhibitor used predominantly for treatment of multiple myeloma, a malignant plasma cell disorder that accounts for about 10% of hematologic malignancies (Delforge et al., 2010). Since its approval by the U.S. Food and Drug Administration (FDA) in 2003, bortezomib has been shown to be effective at improving progression-free and overall survival in patients with multiple myeloma (Richardson et al., 2007). To date, many patients with multiple myeloma will receive bortezomib at some point during their treatment continuum, either as initial therapy or for refractory disease. However, as with many antineoplastic therapies, bortezomib has toxicities. One of the most debilitating side effects is bortezomib-induced peripheral neuropathy (BIPN). BIPN often is a dose-limiting toxicity and can significantly impact a patient's quality of life and ability to perform activities of daily living (ADL) (Stubblefield et al., 2009).

About 33%–66% of patients with newly diagnosed multiple myeloma who receive bortezomib as initial therapy will experi-

ence BIPN, and the incidence may be higher for those previously treated with other neuropathy-inducing agents or with significant risk factors (Argyriou, Iconomou, & Kalofonos, 2008; Richardson, Lau Bach, Classman, Miltiades, & Anderson, 2010). Risk factors for developing BIPN include advanced age, poor nutritional status, preexisting neuropathy, diabetes mellitus, and alcohol abuse (Argyriou et al., 2008). In addition, multiple myeloma itself may cause neuropathy as part of the mechanism of the disease (Richardson et al., 2010). Healthcare providers must effectively assess for this debilitating toxicity so that patients do not undergo significant and incapacitating consequences when BIPN is overlooked.

## Case Study

Mr. X, a 43-year-old Caucasian man, was diagnosed with immunoglobulin A lambda multiple myeloma in April 2010. Prior to his diagnosis, Mr. X had been in excellent health and was an avid athlete, participating in several triathlons. In May 2010, Mr. X initiated treatment

with bortezomib and dexamethasone, a standard first-line therapy combination for patients with multiple myeloma (National Comprehensive Cancer Network [NCCN], 2011). Treatment was stopped after only three cycles because Mr. X developed grade 3 peripheral neuropathy, including significant sensory alterations and paresthesias that interfered with his ability to perform ADL (see Table 1). Subsequently, Mr. X was started on gabapentin as treatment for his BIPN. Fortunately, he had achieved a good partial response to therapy and eventually received an autologous stem cell transplantation.

Although Mr. X's disease is controlled at present, he continues to suffer from painful paresthesias of his hands and feet related to the bortezomib he received as part of his initial therapy. He describes it as burning pain and rates it as 5 of 10 on a typical day. The pain migrates midway up his shins and partially up his forearms. He describes having trouble walking or standing on his feet for long periods of time. He also has difficulty buttoning his clothes, turning pages of a book, and picking up items.

## Characteristics and Differential Diagnoses

BIPN is distinguishable from other types of neuropathy, such as those caused by diabetes (see Table 2), peripheral nerve disorders, and carpal tunnel syndrome. BIPN primarily affects small nerve fibers of the lower limbs and is predominantly a sensory, rather than motor, neuropathy (Richardson et al., 2010). BIPN occurs symmetrically, and patients often report feeling pain, burning, numbness, and hyperesthesia (Richardson et al., 2010; Stubblefield et al., 2009). Autonomic