

# Case Report: Painful Peripheral Neuropathy Following Treatment With Docetaxel for Breast Cancer

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In 2005, an estimated 211,240 women in the United States will be diagnosed with breast cancer (American Cancer Society, 2005). The taxanes—paclitaxel and docetaxel—are chemotherapeutic drugs commonly used to treat breast cancer because of increasing evidence that these drugs reduce local recurrence and mortality rates (Goble & Bear, 2003). Taxanes, however, commonly cause paresthesias in a stocking and glove pattern (Chaudhry, Rowinsky, Sartorius, Donehower, & Cornblath, 1994; Hilken et al., 1996; New, Jackson, Rinaldi, Burris, & Barohn, 1996; Sahenk, Barohn, New, & Mendell, 1994). As the cumulative dose is increased, weakness also may occur (Forsyth et al., 1997; Lipton et al., 1989; van Gerven et al., 1994). Sensorimotor signs and symptoms often are more severe in patients with preexisting peripheral neuropathy (Chaudhry, Chaudhry, Crawford, Simmons-O'Brien, & Griffin, 2003).

Taxanes are effective antineoplastic agents partly because they polymerize free cellular tubulin, stabilizing microtubules in a polymerized state and thereby disrupting the microtubular network essential for mitotic division of the cell (Goble & Bear, 2003). Therefore, rapidly dividing cells, such as breast cancer cells, undergo apoptosis (cell death) in the presence of taxanes that have not been metabolized by the hepatic system (Aventis Pharmaceuticals Inc., 2003). Chemotherapeutic drugs that

Peripheral neuropathy is a common side effect of many chemotherapy agents. As many as 60% of patients receiving taxane therapy report symptoms such as numbness, tingling, burning, pain, and, in severe cases, weakness in a stocking and glove pattern. These symptoms are associated with problems in physical mobility and decreased quality of life, yet few articles in the literature discuss collaborative interdisciplinary assessment and treatment of this population. This article describes the care of a patient with diabetes and docetaxel-induced, painful peripheral neuropathy by a multidisciplinary team of nurses, physicians, and physical therapists. Because nurses are often the first clinicians to recognize symptoms of chemotherapy-induced peripheral neuropathy, they provide the essential coordination of care by appropriate medical and rehabilitative services. This case also raises important questions about the relationship between diabetes mellitus and persistent, painful peripheral neuropathy.

alter microtubules also may impair axonal structure and/or cause endoneurial edema as has been demonstrated in animals treated with vincristine and paclitaxel (Polomano, Mannes, Clark, & Bennett, 2001; Tanner, Levine, & Topp, 1998; Topp, Tanner, & Levine, 2000). Axonal pathology, including atrophy and dying back of large-fiber axons, has been documented in a peripheral nerve biopsy from a patient treated with paclitaxel (Sahenk et al., 1994).

Many nurses are cognizant of the problems caused by neurotoxic chemotherapeutic drugs such as the taxanes and advocate the assessment of patients during and after chemotherapy treatment so that intervention

can be initiated early (Sweeney, 2002; Wilkes, 1999). Common toxicity scores developed by the World Health Organization and Eastern Cooperative Oncology Group often are used to monitor peripheral neuropathy symptoms (Miller, Hoogstraten, Staquet, & Winkler, 1981; Oken et al., 1982). These tools are limited because (a) the toxicity score is subjectively determined by the healthcare provider, (b) the categories are broad (0 = no symptoms to 4 = paralysis), and (c) little evidence indicates that assessment beyond the presence or absence of peripheral neuropathy is done uniformly in most clinical settings. Because of these limitations, nursing assessment also should include a patient history for risk factors that may predispose a patient to neuropathy, a record of patient

symptoms, and a physical examination of large and small peripheral nerve function (Sweeney). Large-fiber functions, including vibration and touch, can be measured easily in the clinic using items such as a tuning fork over bony prominences and a cotton swab or fingertip brushed over the skin. Small-fiber

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