

Taxane-Induced Peripheral Neuropathy

Objective and subjective comparison between paclitaxel and docetaxel in patients with breast cancer

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BACKGROUND: Taxane-induced peripheral neuropathy (TIPN) is caused by the neurotoxicity of paclitaxel and docetaxel, but the differences between paclitaxel- and docetaxel-induced peripheral neuropathy are understudied.

OBJECTIVES: The purpose of this study is to compare TIPN between docetaxel and paclitaxel in patients with breast cancer and to examine the consistency of measuring TIPN between researchers and patients.

METHODS: Secondary data were analyzed from a cross-sectional study that included 64 patients with breast cancer from two teaching hospitals in Taiwan. Objective and subjective TIPN were measured.

FINDINGS: Results indicated significant differences in objective TIPN, sensory sum score, and motor sum score between groups. No significant difference was detected in subjective TIPN between groups.

KEYWORDS

taxane-induced peripheral neuropathy; paclitaxel; docetaxel; breast cancer

DIGITAL OBJECT IDENTIFIER

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IN 2018, BREAST CANCER ACCOUNTED FOR ABOUT 12% of all newly diagnosed cancers worldwide (Bray et al., 2018). Among patients with breast cancer receiving chemotherapy, adverse effects, such as bone marrow suppression, nausea, vomiting, fatigue, musculoskeletal pain, and neurotoxicity, are commonly seen (Tao, Visvanathan, & Wolff, 2015). Neurotoxicity is a leading cause of dose reductions of chemotherapy drugs (Bhatnagar et al., 2014) and delays in treatment (Miltenburg & Boogerd, 2014). The neurotoxicity may lead to peripheral neuropathy, which damages sensory, motor, and autonomic nerves (Miltenburg & Boogerd, 2014; Park et al., 2013). Patients may experience sensory loss, neuropathic pain, numbness, tingling, weakness of limbs, muscle cramps, and loss of deep tendon reflex (DTR) (Miltenburg & Boogerd, 2014; Park et al., 2013). These symptoms tend to occur symmetrically from distal to proximal limbs (Miltenburg, & Boogerd, 2014). Autonomic symptoms rarely occur (Miltenburg & Boogerd, 2014; Park et al., 2013). Various antineoplastic agents that induce peripheral neuropathy have been identified, including platinum drugs (cisplatin, oxaliplatin), vinca alkaloids (vincristine), immunomodulatory agents (thalidomide), proteasome inhibitors (bortezomib), and taxanes (paclitaxel, docetaxel) (Miltenburg & Boogerd, 2014; Park et al., 2013).

Taxanes, including paclitaxel and docetaxel, have been a widely used antineoplastic agent in adjuvant and neoadjuvant chemotherapy for breast cancer (National Comprehensive Cancer Network, 2015). Studies have confirmed the therapeutic effect of taxane-containing regimens on breast cancer; this effect includes improving the overall survival and disease-free survival among patients with early-stage disease (Ferguson, Wilcken, Vagg, Gheri, & Nowak, 2007) and the overall survival, time to progression, and tumor response rate in patients with metastatic cancer (Gheri et al., 2015). However, neurotoxicity from taxane use may cause sensory, motor, and autonomic nerve damage, which is also known as taxane-induced peripheral neuropathy (TIPN).