Intravenous Lidocaine Infusion to Treat Chemotherapy-Induced Peripheral Neuropathy

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Chemotherapy-induced peripheral neuropathy is a debilitating side effect of chemotherapy, which manifests as paresthesias, dysesthesias, and numbness in the hands and feet. Numerous chemoprotective agents and treatments have been used with limited success to treat chemotherapy-induced peripheral neuropathy. We report a case in which a patient presenting with chemotherapy-induced peripheral neuropathy received an IV lidocaine infusion over the course of 60 minutes with complete symptomatic pain relief for a prolonged period of 2 weeks. (A&A Case Reports. 2015;5:154–5.)

Advances in cancer diagnosis and treatment have resulted in an increased life expectancy for patients undergoing cancer treatment with an estimated 28 million cancer survivors worldwide.[1] Unfortunately, many chemotherapy agents cause peripheral neuropathy, which can result in permanent symptoms and disability in up to 40% of cancer survivors.[1] To reduce the incidence of peripheral neuropathy, oncologists occasionally decrease dosages or discontinue treatment altogether, leading to less effective treatment.[2] Chemoprotective agents to reduce neuropathy have had limited success.[3] IV lidocaine has been observed to be effective in treating neuropathic symptoms of chemotherapy in patients with cancer.[4]

The local institutional review board reviewed the case report and gave permission for the authors to publish the report. Institutional review board approval was required because neither the patient nor the family could be contacted.

CASE DESCRIPTION

A 61-year-old woman presented at a pain clinic with hand and foot pain in a glove-stocking distribution after chemotherapy treatment for breast cancer. Her chemotherapy consisted of Adriamycin and cyclophosphamide followed by paclitaxel and trastuzumab. After 4 months of chemotherapy treatment, the patient started experiencing pain and tingling with bilateral numbness in the hands and feet. She did not respond to amitriptyline and gabapentin. Seeking an alternative treatment, we administered 5 mg/kg IV lidocaine over 60 minutes in the pain clinic. Monitoring included electrocardiogram, pulse oximetry, and noninvasive arterial blood pressure. The patient's symptoms of chemotherapy-induced peripheral neuropathy resolved immediately after the infusion. She continued to have excellent pain relief for approximately 2 weeks. When her symptoms started to recur 2 weeks after the infusion, we administered a second infusion in the pain clinic with similar results.

Over the next 9 weeks, the patient had 3 additional lidocaine infusion treatment sessions with each infusion of lidocaine resulting in resolution of neuropathic pain for a duration of approximately 2–3 weeks.

DISCUSSION

The incidence of peripheral neuropathy in patients receiving chemotherapy is approximately 30%–40%.[5] The incidence varies with chemotherapeutic agent and occurs in up to 60% of patients receiving paclitaxel.[6] Compared with those receiving nonchemotherapy treatments, patients receiving oxaliplatin had a 3-fold increase in tingling and numbness and a 2-fold increase in aching/burning symptoms.[7] A registry of colorectal cancer survivors receiving chemotherapy between 2000 and 2009 reported side effects affecting patient quality of life such as trouble opening jars or bottles (11%), tingling in the toes or feet (10%), and trouble walking stairs or standing (9%).[7]

Chemotherapy doses may be reduced to decrease the severity of neuropathic pain, but this can reduce efficacy. Randomized controlled trials studying patients receiving cisplatin compared potential chemoprotective agents such as acetylcysteine, amifostine, adrenocorticotrophic hormone, glutathione, and vitamin E with placebo, revealing insufficient data to conclude that any of these agents prevented or limited neurotoxicity of platins.[3] Lidocaine has been successfully used as an effective treatment against diabetic peripheral neuropathy. In a series of 23 randomized controlled studies, the efficacy of 5% lidocaine-medicated plasters was compared with amitriptyline, gabapentin, pregabalin, carbamazepine, and capsaicin in patients with painful diabetic neuropathy.[8] There was a statistically significant improvement in the quality of life with the lidocaine plaster compared with pregabalin with fewer drug-related adverse events. In another double-blind randomized controlled trial of patients with painful diabetic neuropathy, infusions of lidocaine at 5 and 7.5 mg/kg significantly reduced the severity of neuropathic pain at 14 and 28 days after infusion.[9] Similarly, previous studies indicate significant neuropathic pain relief in patients with cancer immediately after lidocaine infusion treatment and lasting 14 days thereafter.[4] Compared with opioid

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analgesics, lidocaine is associated with less sedation, confusion, nausea, and constipation.[10] Lidocaine toxicity can be easily managed by decreasing the infusion rate[10] or the use of lipid emulsion.[11]

Animal studies have investigated the effect of lidocaine in treating chemotherapy-induced peripheral neuropathy. In a murine study of chemotherapy-induced nociceptive peripheral neuropathy, IV lidocaine doses of 3–6 mg/kg showed an effective antiallodynic effect.[12]

Our experience with this patient suggests a clinical need for an adequately powered prospective randomized clinical trial of lidocaine to evaluate safety and efficacy in patients with chemotherapy-induced peripheral neuropathy refractory to conventional oral analgesics.

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