Radiation Safety Guidelines for Radioimmunotherapy With Yttrium 90 Ibritumomab Tiuxetan

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Radioimmunotherapy is a new cancer therapy that combines the cytotoxicity of radiation with the tumor-specific targeting of monoclonal antibodies. Yttrium 90 (Y-90) ibritumomab tiuxetan (Zevalin®, IDEC Pharmaceuticals Corporation, San Diego, CA) is indicated for the treatment of patients with relapsed or refractory low-grade, follicular, or transformed B-cell non-Hodgkin’s lymphoma (NHL), including patients with rituximab-refractory follicular NHL. Y-90 ibritumomab tiuxetan requires only universal safety precautions and does not impose undue risks or radiation safety restrictions on patients or healthcare workers. The ibritumomab tiuxetan regimen can be administered safely in an outpatient setting. Nurses should become familiar with the necessary precautions in caring for patients treated with Y-90 ibritumomab tiuxetan, both to educate patients about safety issues and to minimize the risk of radiation exposure to staff and others.

Key Words: radioimmunotherapy, safety

Radioimmunotherapy

RIT is an approved treatment modality that combines the cytotoxicity of radiation with the specificity of monoclonal antibodies for tumor cell surface antigens (Potamianos, Varvarigou, & Archimandritis, 2000). Nonradioabeled, or “cold,” monoclonal antibody therapy for relapsed indolent NHL has been shown to produce a 48% overall response rate in NHL that has relapsed after treatment with chemotherapy, with the median duration of response of 11.8 months (McLaughlin et al., 1998). Still, the median survival after a diagnosis of follicular NHL remains approximately 8–12 years (Reiser & Diehl, 2002). However, RIT can deliver higher doses of radiation to targeted tumors than to nearby healthy organs (Press et al., 1993; Wiseman et al., 2001). After the delivery of the radio nuclide to malignant tissue by the antibody’s targeting of the antigen, cancer cells are killed by a combination of the targeted radiation, the biologic effect of the monoclonal antibody, and the crossfire effect of the radiation on nearby tumor cells to which the antibody did not bind (e.g., because of physical inaccessibility, because the tumor cell did not express the antigen).

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