Chemotherapy in the Elderly: Supportive Measures for Chemotherapy-Induced Myelotoxicity

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Not only is the U.S. populace aging, but the incidence of cancer in the elderly also is increasing. Many elderly patients with cancer can obtain the same benefits from standard chemotherapy as younger patients can, but the elderly are more susceptible to the myelotoxicity of chemotherapy, which can limit the dose intensity of their treatments. Nurses can help identify patients at risk before they are treated with chemotherapy and discuss the need for hematopoietic support with other members of the treatment team. They also can provide ongoing patient and family education and teach patients to recognize and report early symptoms of potential problems. Appropriate supportive measures, such as granulocyte–colony-stimulating factor, reduce the risk of chemotherapy-induced neutropenia and related infections and make the use of full-dose chemotherapy possible in elderly patients despite their greater risk of myelosuppression.

Key Words: aged, antineoplastic protocols, immunosuppression, granulocyte–colony-stimulating factor

The U.S. populace is aging, and elderly patients (ages 65 and older) are becoming an increasingly larger proportion of the patient population. As the elderly population increases, the incidence of cancer and the number of cancer-related deaths in the elderly also are increasing (Lyman, Kuderer, & Balducci, 1998; Yancik & Ries, 2000). The elderly currently constitute only 13% of the population, but more than half of all cancers and about two-thirds of all cancer-related deaths occur in this age group (Balducci, 2001; Yancik & Ries) (see Figure 1).

The higher incidence of cancer in the elderly may be attributed to two factors: greater cumulative carcinogenic effects over time and age-related molecular changes (such as decreased production of protective enzymes and hormones) in various tissues (Balducci, 2001; Balducci & Extermann, 2000a). Higher mortality rates in elderly patients with cancer may be caused by other disease states or related to their treatments because of elderly patients' potentially lower tolerance to therapy (Balducci; Yancik & Ries, 2000). Reductions in chemotherapy dose intensity, a common practice in the elderly patient population, also may contribute to death rates because reduced dose intensity is associated with lower response rates and decreased survival (Dixon et al., 1986; Gómez et al., 1998; Vose et al., 1988). Aging is an individualized process, however, and several studies have shown that patients' clinical outcomes are more likely to correlate with their physical, mental, emotional, and functional status than with their chronologic age (Balducci; Balducci & Extermann, 2000a).

This article discusses issues in cancer and chemotherapy in elderly patients and the need for treatment protocols and supportive measures that are more appropriate for this patient population.

Biologic Changes Associated With Aging

Biologic changes in elderly people affect the likelihood of developing cancer. These changes also can alter the activity of tumors in patients with cancer as well as their responses to treatments. In general, elderly patients are at greater risk of cancer and are more susceptible to the toxic effects of chemotherapy (Balducci, 2001).

As people age, cumulative damage occurs to their DNA. If DNA damage involves specific genes, such as oncogenes or tumor-suppressor genes, it can lead to the development of cancer (Balducci, 2001). In younger people, a number of mechanisms protect the body from cellular damage, including enzymes that deactivate reactive oxygen species, hormones that aid cellular repair, and mitochondria-mediated apoptosis of cells that contain damaged DNA (Balducci). Aging is associated with deficiencies in these protective systems, allowing DNA-damaged cells with malignant potential to persist and eventually develop into cancer.

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