Cognitive Dysfunction Following Adjuvant Chemotherapy for Breast Cancer: Two Case Studies

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Purpose/Objectives: To describe the cognitive dysfunction experienced by two women after they received adjuvant chemotherapy for breast cancer and to discuss the potential role of changes in reproductive status and depression in the development of cognitive dysfunction.

Data Sources: Journal articles, research data, and clinical experience.

Data Synthesis: Following chemotherapy, 17%–50% of women with breast cancer experience cognitive dysfunction that may include decrements in memory, attention, and psychomotor efficiency. One mechanism that may contribute to cognitive dysfunction involves changes in reproductive status resulting from chemotherapy. Additionally, the presence of depression may confound the experience of cognitive dysfunction.

Conclusions: A comprehensive description of cognitive dysfunction and improved understanding of the interrelationships among cognitive dysfunction, reproductive hormone levels, and depression in women with breast cancer receiving adjuvant chemotherapy may hasten the development of interventions for the management of cognitive dysfunction.

Implications for Nursing: Nurses should teach women with breast cancer and their families about the potential for cognitive dysfunction after chemotherapy so the problem can be recognized and interventions can be implemented to help women compensate for the dysfunction.

Key Points . . .

➤ Cognitive dysfunction can persist for years following the completion of adjuvant chemotherapy in women with breast cancer.

➤ Cognitive dysfunction associated with adjuvant chemotherapy can affect the ability of women with breast cancer to maintain usual family, career, and community responsibilities.

➤ Women with breast cancer can be taught to integrate strategies into their lives to help compensate for the cognitive dysfunction they experience as a consequence of adjuvant chemotherapy.

Breast cancer is the most common malignancy and the second leading cause of cancer-related death in women in the United States (Jemal et al., 2003). Twenty-five percent of women with breast cancer are premenopausal at the time of diagnosis (Danforth, 1991). Adjuvant chemotherapy has significantly improved the cure rate in premenopausal women with early-stage breast cancer; however, chemotherapy for breast cancer has been associated with deficits in cognitive function (Brezen, Phillips, Abdoell, Bunston, & Tannock, 2000; Paganini-Hill & Clark, 2000; Schagen et al., 1999; van Dam et al., 1998). These deficits may persist for years after the completion of treatment (Berglund, Bolund, Fornander, Rutqvist, & Sjoden, 1991; Cimprich, 1992; Paganini-Hill & Clark; Schagen et al.; van Dam et al.; Wiencek & Dienst, 1995).

Cognitive dysfunction occurs in 17%–50% of women who receive chemotherapy for breast cancer (Brezen et al.; van Dam et al.) and may include decrements in verbal and visual memory, mental flexibility, psychomotor efficiency, attention and concentration, and visuospatial ability (Bender, Paraska, Sereika, Ryan, & Berga, 2001).

One mechanism that may contribute to cognitive dysfunction in women who receive chemotherapy for breast cancer involves changes in reproductive hormone levels and consequent change in reproductive status (Bender et al., 2001). Adjuvant chemotherapy results in loss of estrogen and progesterone and ovarian failure in 77% of women who are premenopausal at the time of a breast cancer diagnosis (Bines, Oleske, & Cobleigh, 1996; Mehta, Beattie, & Das Gupta, 1992). Reductions in estrogen and progesterone levels are associated with deficits in learning, memory, attention, and psychomotor efficiency in healthy women who experience natural or surgical menopause (Farrag, Khedr, Abdel-Aleem, & Rageh, 2002; Phillips & Sherwin, 1992; Sherwin, 1996). Improvement in these dimensions of cognitive function occurs with hormone replacement therapy (Grodstein et al., 2000; Henderson, Paganini-Hill, Emanuel, Dunn, & Buckwalter, 1994; Resnick & Maki, 2001; Robinson, Friedman, Marcus, Tinklenberg, & Yesavage, 1994; Sherwin & Gelfand, 1985). However, no studies have examined the extent to which chemotherapy influences the relationship between cognitive function and reproductive hormone status in premenopausal women with breast cancer. Additionally, although not all women with breast cancer experience depression during the course of treatment, the presence of depression may be a confounding factor in the experience of cognitive dysfunction in this population (Cohen, Weingartner, Smallberg, Pickar, & Murphy, 1982; Weingartner & Silberman, 1982).