Chemotherapy-Induced Cognitive Impairment

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Terms such as "chemobrain" or "chemofog" may be familiar to many patients with cancer. Specific chemotherapy agents are known to cause chemotherapy-induced cognitive impairment (CICI). Interventions to prevent or reduce cognitive impairment can be helpful to patients. Nurses can make better assessments and individualized care plans by educating patients about the signs and symptoms of CICI.

AT A GLANCE

- Some known chemotherapy agents, such as doxorubicin, vincristine, and cisplatin, are associated with CICI or chemobrain.
- Nonpharmacologic and pharmacologic options are available to help prevent and control CICI.
- Nurses can provide evidence-based education on CICI to cancer survivors and their caregivers, as well as individualize care based on the patient's symptoms or needs.

KEYWORDS
nursing interventions; patient education; chemobrain; cognitive impairment

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Chemotherapy-induced cognitive impairment (CICI), also known as "chemobrain" or "chemofog," can greatly affect the quality of life of a cancer survivor. Some chemotherapy agents can cause a peripheral inflammatory response that leads to brain changes and can result in cognitive impairment (Ren et al., 2017). About 75% of patients receiving chemotherapy have reported symptoms related to CICI, and about 35% of those patients have experienced such symptoms for months or years after treatment (Asher et al., 2019; Bompaire et al., 2017). Risk factors for CICI include cancer diagnosis at a younger age, menopause status, increasing age, and history of anxiety, depression, and alcohol abuse (Cascella et al., 2018). The most common symptoms related to CICI are problems with memory, attention, and speed of processing thoughts (Moore et al., 2019; Ren et al., 2017). CICI symptoms can be similar to symptoms that accompany accelerated aging syndromes. Some patients with CICI also report increased anxiety, fatigue, depression, or overall health decline (Cascella et al., 2018). Although there are many symptoms associated with CICI, anticipating or predicting CICI in advance is challenging.

Chemotherapy Agents Associated With CICI

Although it is unclear whether all chemotherapy agents cause CICI, some drugs have been found to affect cognitive function. Doxorubicin, a chemotherapy agent used to treat multiple cancers, contributes to neurotoxicity and can induce DNA damage, oxidative stress, and synaptic dysplasia (Ramalingayya et al., 2017). Cisplatin can cause neurologic changes in the brain that affect cognitive ability even at a reduced dose (Ongnok et al., 2020). A regimen consisting of the chemotherapy agents rituximab, cyclophosphamide, vincristine, doxorubicin, and prednisone, collectively referred to as R-CHOP, is commonly used to treat lymphoma and may also contribute to cognitive impairment (Portluck, 2017). Vincristine is a neurotoxic agent, and prednisone can cross the blood–brain barrier; thus, both agents can increase the risk of cognitive impairment along with the cognitive effects of doxorubicin (Ongnok et al., 2020). Other chemotherapy agents associated with CICI are methotrexate, 5-fluorouracil, carmustine, and cytarabine (Cascella et al., 2018).

Interventions for Treatment of Cognitive Impairment

Nonpharmacologic interventions may be used to treat cognitive impairment in patients receiving chemotherapy. Physical exercise may prevent or limit cognitive impairment. More physically active patients are less likely to develop memory loss or memory decline, which can present as initial symptoms of CICI (Salerno et al., 2021). Individuals who engage in moderate to vigorous