

Chemobrain

Many breast cancer patients often complain of brain fog, confusion and decreased attention after receiving chemotherapy; this phenomenon is often referred to as "chemobrain". For some individuals, these effects persist even after chemotherapy has ultimately stopped. The numbers vary greatly and studies suggest that anywhere from 15 to 50% of breast cancer patients experience the cognitive effects associated with chemotherapy even after treatment has terminated (2, 3). The most common complaints include memory deficits and reduced concentration (1, 3). The pathophysiology of the cognitive dysfunction is unknown, however, imaging studies have shown a regional reduction in grey matter and white matter after chemotherapy and PET imaging has found decreased or abnormal metabolic activity in a number of areas (1, 2). It is difficult to determine whether the cognitive deficits often identified in breast cancer patients are a direct result of the chemotherapy. In fact, research suggests that between 11 and 35% of individuals demonstrate some level of cognitive deficits prior to receiving chemotherapy, although it has been suggested that these findings are associated with the anxiety and depression that often accompany a diagnosis of cancer (2, 3). Therefore, some have suggested the use of the term "cancer related decline" rather than "chemo related decline"; (3).

There are several studies that have examined the cognitive deficits present in women with breast cancer that have undergone chemotherapy. A meta-analysis of 7 studies involving more than 300 participants found an overall small, but significant decline in global cognitive functioning with differences in mean scores measuring about one quarter to one half a standard deviation in women who participated in adjuvant chemotherapy as treatment for breast cancer (1). No findings from the studies reached clinically significant impairment levels (1). The areas demonstrating the most decline included working memory, long-term memory, spatial and motor abilities. Several other studies have identified deficits in the more specific areas of executive functioning and verbal memory as well (1, 3, 6). In general, the cognitive picture presented in women who have participated in adjuvant chemotherapy and experienced cognitive decline is more of a frontal, subcortical picture (6, 8). Both testing and imaging seem to support this idea (8). Studies have also found that there is little correlation between an individual's self-report of cognitive functioning and their actual performance (4, 5). One study looked at long-term survivors of breast cancer over the age of 65. Cognitive differences were found in the areas of attention, working memory, psychomotor processing speed, and executive functioning ranging from .75 to 2 standard deviations; however, no differences were found among language, visuospatial functioning and memory skills (6).

There are several cytotoxic drugs used in chemotherapy. Endocrine therapy may also be prescribed as another adjuvant therapy for the treatment of breast cancer. Endocrine therapy often involves the drug, Tamoxifen (Nolvadex), which is an anti-estrogen drug or selective estrogen receptor modulator (4). One study looked at the cognitive functioning of healthy controls, women who participated in chemotherapy alone and women who participated in chemotherapy and were also prescribed Tamoxifen. No consistent profile was found in either group. Women who received chemotherapy alone compared to healthy controls evidenced more problems on verbal learning, visuospatial and visual memory tasks (4). Women who received chemotherapy in conjunction with Tamoxifen performed even more poorly than the group who received chemotherapy alone. Findings from this study suggest that the combination of the two therapies can have subtle, yet adverse effects on cognitive functioning (4). The authors of this study suggest cognitive deficits seen in breast cancer patients may be more an effect of adjuvant systemic therapy (4).

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