Neurotoxic effects of chemotherapies on cognition in breast cancer survivors

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Cancer-related cognitive impairment is often referred to as 'chemobrain' and anthracycline-based chemotherapy may have greater negative effects on particular cognitive domains and brain network connections than nonanthracycline-based regimens, according to an article published online by *JAMA Oncology*.

Chemotherapy for breast cancer is often associated with cognitive problems in patients. However, it is unclear whether certain regimens are associated with greater cognitive difficulties than others.

Shelli R. Kesler, Ph.D., of the University of Texas MD Anderson Cancer Center, Houston, and Douglas W. Blayney, M.D., of the Stanford University School of Medicine, California, compared the effects of anthracycline and nonanthracycline chemotherapy regimens on cognitive status and functional brain connectivity in a small study.

The authors used cognitive tests and imaging data from 62 primary breast cancer survivors (average age nearly 55) who were, on average, more than two years off therapy to examine cognitive status and functional brain connectivity. Of the women, 20 received anthracycline-based chemotherapy as part of their primary treatment, 19 received nonanthracycline regimens and 23 did not receive any chemotherapy.

Women treated with anthracycline-based chemotherapy had lower verbal memory, including immediate recall and delayed recall, compared with the other two groups of women. The anthracycline regimens also were

associated with lower default mode brain network connectivity, suggesting a decreased efficiency of information processing, according to the study.

Patient-reported outcomes of cognitive dysfunction and psychological distress were elevated in both groups of women treated with chemotherapy compared with patients treated without chemotherapy, the results indicate.

"These results should be considered preliminary given the study limitations of small sample size and retrospective, cross-sectional design, Larger, prospective studies are needed that include pretreatment and posttreatment assessments so that patients' individual cognitive and neurobiologic trajectories can be evaluated with respect to potential ANTHR [anthracycline]-related neurotoxic effects," the study concludes.

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