Newest data links inflammation to chemo-brain

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Credit: University of Rochester Medical Center

Inflammation in the blood plays a key role in "chemo-brain," according to a published pilot study that provides evidence for what scientists have long believed.

The research is important because it could lead to a new practice of identifying inflammatory biomarkers in cancer patients and then treating the inflammation with medications or exercise to improve cognition and other symptoms, said senior author Michelle C. Janelsins, Ph.D., associate professor of Surgery in the Cancer Control and Survivorship program at the Wilmot Cancer Institute.

Published in the *Journal of Neuroimmunology*, the preliminary research

is believed to be among the first studies to look at cancer patients in active treatment and whether inflammation is involved in their chemo-brain symptoms.

Results showed that among 22 breast cancer patients taking chemotherapy, those with higher levels of inflammatory biomarkers in their blood did worse on neuropsychological tests for visual memory and concentration.

Chemo-brain, or cancer-related cognitive impairment, is estimated to impact 80 percent of people in treatment. Patients report fogginess, forgetfulness, and difficulty with multitasking and other problem-solving skills.

Researchers discovered that one particular biomarker for acute inflammation—tumor necrosis factor-alpha—was the strongest indicator of cognitive problems. Generally, higher levels of inflammation can be caused by cancer, its treatment, or other health problems; but until lately little had been known about the interplay of inflammation, cancer, and quality of life.

Last year another study led by Janelsins —one of the largest to date for this problem—showed that women with breast cancer continued to report cognitive deficits for as long as six months after finishing treatment. That study not only validated that chemo-brain was pervasive, but Janelsins and her team also began parsing the data to understand the biological mechanisms, such as inflammation, that may put some patients at greater risk for chemo-brain.

"I'm happy that my team's research is starting to shed light on what might be causing cognitive problems in patients with cancer," Janelsins said, "and I'm hopeful that we'll be able to come up with treatments in the future."

More information: AnnaLynn M. Williams et al. Associations between inflammatory markers and cognitive function in breast cancer patients receiving chemotherapy, *Journal of Neuroimmunology* (2017). DOI: 10.1016/j.jneuroim.2017.10.005