

Antioxidant, inflammation levels may reveal new diagnostic tool for breast cancer

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Micrograph showing a lymph node invaded by ductal breast carcinoma, with extension of the tumour beyond the lymph node. Credit: Nephron/Wikipedia

A new study that analyzes levels of antioxidants and stress markers in the blood could lead to a new diagnostic tool for breast cancer. The research will be presented this week in Philadelphia at the American Physiological Society's (APS) annual meeting at Experimental Biology 2022.

Breast cancer is the most prevalent cancer in the world. The World Health Organization estimates that in 2020, there were nearly 8 million women living with breast cancer who had been diagnosed in the past five years. Identifying new diagnostic techniques is of major importance to efforts that aim to minimize the disease's devastating effects. Researchers from the University of Lahore in Pakistan explored the role that inflammatory and stress markers may play in the development and progression of breast cancer.

The research team examined blood samples from premenopausal women diagnosed with breast cancer. When compared to age-matched controls without cancer, the [breast cancer patients](#) had significantly increased levels of inflammatory markers. Among the overexpressed markers were the pro-inflammatory protein interleukin-1, [matrix metalloproteinase 9](#)—an enzyme that is overexpressed in several diseases—and heat shock protein 27. This protein acts as an antioxidant that typically prevents or reduces cell death. However, in some disease states—such as cancer—[heat shock protein 27](#) has been found to be both protective and destructive.

In addition, the breast cancer group had low levels of protective compounds such as vitamins A, C and D, catalase—an enzyme that protects cells from oxidative stress—and the antioxidants superoxide dismutase and glutathione.

"The breast cancer pathophysiology included an overbalance of oxidants or stress markers and an underbalance of antioxidants," said Samina

Malik, MBBS, MPhil, first author of the study. This proportion of pro- and anti-inflammatory components may play "a crucial role in the metastasis of [breast cancer](#)" and may be useful as a diagnostic marker for the disease, the researchers explained.

More information: Abstract: "Breast cancer revisited: stress-induced conspiracy, sensitivity and specificity," experimentalbiology.org/

Provided by Experimental Biology

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