Study: Breast cancer disparity equally impacted by social determinants of health, tumor biology

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Researchers at the University of Illinois Chicago have examined national data about women with early-stage, estrogen receptor-positive breast

cancer and found that social determinants of health and tumor biology contributed equally to higher rates of death among Black women.

The study, published in *JAMA Oncology*, is the first study of breast cancer disparities to include a genomic biomarker of tumor aggression in the analysis of the proportion of the disparity mediated by tumor biology.

The researchers say that their findings validate the role of social determinants of health as a root cause of racial disparities in breast cancer outcomes and also suggest that to eliminate the survival gap, which was first documented more than four decades ago, we need "a clearer picture of the biological mechanisms underlying the aggressive tumor phenotype that is more prevalent in Black women, and insight into the complex relationship between adverse social conditions, ancestry-related genetic variants and tumor biology."

"Adverse social determinants of health are well-known root causes of the racial disparity in breast cancer survival. This study added to our understanding of this public health problem by demonstrating conclusively that disproportionately aggressive tumor biology in Black women not only contributes to disparate outcomes but appears to be as important as social disadvantage," said lead author Dr. Kent Hoskins, the Eileen Lindsay Heidrick Professor of Oncology in the College of Medicine and associate director of translational research in the University of Illinois Cancer Center at UIC. "The study also suggested that social factors may actually be driving some of the racial difference in tumor biology."

For their analysis, the researchers reviewed data available through the National Cancer Institute's Surveillance, Epidemiology and End Results Program. They looked at stage 1 and stage 2 estrogen receptor-positive breast cancers, the most common type of breast cancer that generally has

the most favorable prognosis, with cases that were diagnosed between 2004-2015.

Data from 60,137 Black and non-Hispanic white women were included in the study.

The researchers calculated the effect of social determinants of health—specifically neighborhood disadvantage and insurance status—on mortality, and found they accounted for 19% of the disparity. They also calculated the effect of biological characteristics of the tumors by looking at data from genomic laboratory test results, which were used to anticipate tumor response to chemotherapy and likelihood of recurrence. They found tumor biology accounted for 20% of the disparity.

They also found, similar to many other studies, that white women were more likely than Black women to be in the highest income and education groups and in the lowest poverty group, and to have health insurance. Black women were more likely to have aggressive tumors with a high risk of recurrence, to be diagnosed at stage 2 and to receive chemotherapy.

"By focusing our analysis on women with ER-positive tumors and by including tumor genomics as a mediating variable, we were able to more precisely quantify the relative excess of breast cancer death mediated by aggressive tumor biology in Black women with the most common breast cancer subtype," the authors wrote.

Hoskins said this adds to evidence that the UIC team generated over the past few years indicating that the tools used to determine the best treatments for patients, like the genomic oncotype tests used for patients in the study, may not be serving Black women as well as white women.

"The tools we have to aid in decision-making regarding treatments do not take into account potential differences in tumor biology across race and ethnicity, and even worse could be providing misleading information or a false sense of security with treatment decisions for Black women," Hoskins said.

Co-authors of the study are Gregory S. Calip, Hsiao-Ching Huang, Dr. Abiola Ibraheem, Dr. Oana C. Danciu and Dr. Garth H. Rauscher.

More information: Kent F. Hoskins et al, Association of Social Determinants and Tumor Biology With Racial Disparity in Survival From Early-Stage, Hormone-Dependent Breast Cancer, *JAMA Oncology* (2023). DOI: 10.1001/jamaoncol.2022.7705

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