

Breast density tied to specific types of breast cancer

July 27 2011

Women with breasts that appear dense on mammograms are at a higher risk of breast cancer and their tumors are more likely to have certain aggressive characteristics than women with less dense breasts, according to a study published online July 27 in the *Journal of the National Cancer Institute*.

Mammographic breast density--a reflection of the proportions of fat, connective tissue, and epithelial tissue in the breast--is a well-established risk factor for [breast cancer](#). Women with higher amounts of epithelial and stromal tissue have higher density and higher risk. However, it has not been clear whether [breast density](#) was associated with specific [tumor characteristics](#) and tumor type.

To explore this issue, Rulla M. Tamimi, Sc.D., at Harvard Medical School and Brigham and Women's Hospital, Boston, and colleagues, compared breast density in 1,042 [postmenopausal women](#) with breast cancer and 1,794 matched [control subjects](#) (women who were similar in terms of age, postmenopausal hormone use, and other factors, but did not have breast cancer).

The researchers found, as expected, that the risk of breast cancer increased progressively with increasing breast density. The associations were stronger for larger tumors than for smaller tumors; for high-grade than for low-grade tumors; and for estrogen receptor-negative than for estrogen receptor-positive tumors. The link between density and breast cancer also appeared to be stronger for [ductal carcinoma](#) in situ (DCIS)

than for invasive tumors. There was no association, however, between density and other markers of tumor aggressiveness, such as nodal involvement and HER2 status.

The authors conclude that higher mammographic density is associated with more aggressive tumor characteristics and also with DCIS. "Our results suggest that breast density influences the risk of breast cancer subtypes by potentially different mechanisms," they write. "Further studies are warranted to explain underlying biological processes and elucidate the possible pathways from high breast density to the specific subtypes of breast carcinoma."

An accompanying editorial agrees that understanding the biological links between breast density and specific tumor subtypes could help us understand more about breast cancer risk and the molecular causes of breast cancer. Karla Kerlikowske, M.D., of the University of California, San Francisco and Amanda Phipps, Ph.D., of Fred Hutchinson Cancer Research Center in Seattle emphasize that this large study was the first to find a stronger association between breast density and ER-negative tumors than ER-positive tumors.

They caution, however, that this stronger association might be due, in part, to the 'masking effect.' "Masking of a tumor can occur because cancerous tissue and mammographically dense tissue have similar x-ray attenuation, allowing tumors to go undetected on screening mammography examination and progress to a more advanced and aggressive stage before detection," they write. In this study, it is not known whether the tumors were detected by screening mammography. The editorialists also discuss other possible reasons for the strong link between density and aggressive tumors, including the interaction of increased numbers of stromal and epithelial cells in dense breasts and exposure to postmenopausal hormones.

They conclude that breast density is an important risk factor for diverse subtypes of breast cancer. "Given that the magnitude of the association with breast density is strong across all breast cancer subtypes and particularly for ER-negative disease, breast density should be included in risk prediction models across tumor subtypes," they write.

Provided by Journal of the National Cancer Institute

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