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Annual vs. biennial mammography and breast tumor prognostic characteristics

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Premenopausal women diagnosed with breast cancer following a biennial screening mammogram were more likely to have bigger more advanced tumors than women screened annually, while postmenopausal women not using hormone therapy had a similar proportion of tumors with less favorable prognostic characteristics regardless of whether their screening mammogram was biennial or annual, according to an article published online by *JAMA Oncology*.

Screening mammography intervals remain under debate in the United States. However, mammography accuracy has improved, new breast cancer treatments have been developed, and interest has increased in tailoring screening recommendations to individual risk to maximize the balance of benefits vs. harms.

Diana L. Miglioretti, Ph.D., of the University of California-Davis School of Medicine, and coauthors compared the proportion of less vs. more favorable tumor prognostic characteristics in women with breast cancer who had annual vs. biennial screening mammograms by age, menopausal status and postmenopausal hormone therapy (HT) use. The authors update previous analyses by using narrower intervals for defining annual (11-14 months) and biennial (23-26 months) screening.

The authors used data from Breast Cancer Surveillance Consortium facilities and included a total of 15,440 women (ages 40 to 85) with breast cancer diagnosed within one year of an annual or within two years of a biennial screening mammogram.

The authors defined less favorable prognostic characteristics as tumors that were stage IIB or higher, bigger than 15 millimeters, positive lymph nodes and any one or more of these characteristics.

Among the 15,440 women with breast cancer, most were 50 or older (13,182 or 85.4 percent), white (12,063 or 78.1 percent) and postmenopausal (9,823 or 63.6 percent). Women who had biennial screening mammograms were more likely to be in the youngest (40 to 49) or oldest (70 to 85) age groups and less likely than women screened annually to have a family history of breast cancer.

Premenopausal women (2,027 or 13.1 percent) had higher proportions of ductal carcinoma in situ (DCIS) vs. invasive cancers and invasive tumors with less favorable prognostic characteristics than postmenopausal women. Among premenopausal women, women screened biennially vs. annually had a higher proportion of stage IIB or higher tumors (25.7 percent vs. 19.8 percent), tumors greater than 15 millimeters (65.3 percent vs. 54.6 percent) and node-positive disease (36.6 percent vs. 31.3 percent), the results show.

Differences in these tumor characteristics among postmenopausal women were small and inconsistent, regardless of HT use, and the differences in women taking postmenopausal HT were not statistically significant, the study reports. The proportions of tumors with less favorable prognostic characteristics were not significantly larger for postmenopausal women not taking HT who were screened biennially or annually.

The authors note their study did not measure breast cancer mortality so they do not know if increases in the proportions of less favorable tumors with biennial vs. annual screening would result in differences in breast cancer mortality.

"Our findings suggest that menopausal status may be more important than age when considering breast cancer screening intervals, which is biologically plausible.... Our findings of a lower proportion of less favorable tumors with more frequent screening in premenopausal women, and no statistically significant difference in the proportion of less favorable tumors in postmenopausal women by screening interval, add to evidence about the potential benefits and harms of screening that policymakers can use to set guidelines about screening intervals and women can use when making personal screening decisions with their clinicians," the authors conclude.

In a related commentary, Wendy Y. Chen, M.D., M.P.H., of Brigham and Women's Hospital and the Dana Farber Cancer Institute, Harvard Medical School, Boston, writes: "Although the authors do not endorse annual or biennial screening, they imply that biennial screening would be acceptable for postmenopausal women but inferior for premenopausal women owing to their findings of a higher proportion of 'less favorable' cancers with biennial screening in that subgroup.... This study and others have clearly demonstrated that with less frequent mammography, the tumors will be bigger and have a slightly more advanced stage. However, with our better understanding of tumor biology and improvements in targeted therapy, the best way to optimize the risk and/or benefit of screening may not be to maximize the chances of finding a smaller tumor. Instead, efforts should be focused on a better understanding of how screening interacts with tumor biology with a better understanding of the types of interval cancers and sojourn times and how these characteristics differ by age and/or menopausal status."

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