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Mammographic Screening for Women with Dense Breasts, Prof. Diana Miglioretti

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As breast density legislation is introduced in more and more states of the USA to inform women that they have dense breasts and to promote discussion of supplemental screening, research into technology, frequency and other factors continues.

A study by the National Cancer Institute funded Breast Cancer Surveillance Consortium (BCSC), published 18 May in *Annals of Internal Medicine*, led by Prof. Karla Kerlikowske, Departments of Medicine and Epidemiology/Biostatistics, University of California San Francisco, looked at interval cancer rates in women with dense breasts. The research aimed to determine which combinations of breast cancer risk and Breast Imaging Reporting and Data System (BI-RADS) breast density categories are associated with high interval cancer rates. The prospective cohort study analysed data collected from the Breast Cancer Surveillance Consortium from 2002 to 2011, which included 365,426 women aged 40 to 74 years who had 831, 455 digital screening mammography examinations. Cases were evaluated by BI-RADS breast density, BCSC 5-year breast cancer risk, and interval cancer rate (invasive cancer ≤12 months after a normal mammography result) per 1000 mammography examinations. High interval cancer rate was defined as more than 1 case per 1000 examinations. Almost half the women in the study had dense breasts, and the proportion with heightened five-year risk was highest among those with extremely dense breasts.

The highest interval rate of advanced stage disease (>0.4 case per 1000 examinations) was observed among women with 5-year risk of 2.50% or greater and heterogeneously or extremely dense breasts (21% of all women with dense breasts).

High interval cancer rates were observed for women with 5-year risk of 1.67% or greater and extremely dense breasts or 5-year risk of 2.50% or greater and heterogeneously dense breasts (24% of all women with dense breasts).

Five-year risk was low to average (0% to 1.66%) for 51.0% of women with heterogeneously dense breasts and 52.5% with extremely dense breasts, with interval cancer rates of 0.58 to 0.63 and 0.72 to 0.89 case per 1000 examinations, respectively.

Women with extremely dense breasts and intermediate to high five-year breast cancer or heterogeneously dense breasts and high five-year breast cancer risk were at highest risk for developing breast cancer after a normal mammogram.

The authors note that the study is limited in that they did not assess the benefit of supplemental imaging for women with dense breasts. They conclude, “Breast density should not be the sole criterion for deciding whether supplemental imaging is justified because not all women with dense breasts have high interval cancer rates. BCSC 5-year risk combined with BI-RADS breast density can identify women at high risk for interval cancer to inform patient–provider discussions about alternative screening strategies.” *HealthManagement.org* spoke t o one of the researchers, Prof. Diana Miglioret ti, Dean’s Professor in Biostatistics, University of California Davis about the study.

The publication of this research is very timely as more states in the U.S. enact breast density legislation*. Is this the first study of its kind? Why did the Breast Cancer Surveillance Consortium set out to investigate this?

This is the first study that looked at interval cancer rates in women with dense breasts combined with a breast cancer risk score. We set out to identify subgroups of women who have the most potential to benefit from supplemental imaging given that about half of women of screening age in the U.S. have dense breast tissue. Our prior research estimated this to be 28 million women of screening age in the U.S. To us, that seemed like a lot of women to consider for supplemental imaging given the current options are associated with potential harms such as high false-positive rates.

The paper mentions “sufficiently high interval cancer rates?” How was this determined?

Our threshold for “sufficiently high interval cancer rates” was based on prior research for which we used an expert panel to identify minimally acceptable screening mammography interpretive performance measures (in other words, thresholds for what would be an acceptable level of accuracy interpreting mammography).

What do you hope will follow on from this research? How should w omen interpret this?

I hope advocacy groups that are encouraging use of supplemental imaging in women with dense breasts, and legislators passing laws in the U.S., will understand that breast density should not be the sole criterion for identifying women who should consider supplemental imaging. Breast cancer risk combined with breast density categories can identify women for whom supplemental imaging discussions are most appropriate, because women with intermediate to high breast cancer risk in combination with breast density are at highest risk of a cancer being

missed on mammography. Many women with dense breasts are not at increased breast cancer risk in general, and not at high risk of having a breast cancer missed by mammography. Use of supplemental screening in these lower risk women may increase the harms associated with cancer screening with minimal potential increase in benefit.

Is further research planned that might look at this population of women and use of supplemental imaging such as tomosynthesis and/or breast ultrasound or increased frequency of screening?

We hope to conduct a similar study among women being screened with digital breast tomosynthesis. We are also evaluating the performance of screening breast ultrasound in community practice by breast density and breast cancer risk to better quantify the potential benefits and harms. In addition, we recently improved the Breast Cancer Surveillance Consortium (BCSC) breast cancer risk model by adding history of benign breast diseases such as atypical hyperplasia and lobular carcinoma in situ. Our paper is in press and the new risk calculator will be released once it is published.

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