

Cancer Advances: Study Finds MRI Better Than Mammography in Detecting Hereditary Breast Cancers in At-Risk Populations

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A large Dutch study of women at increased risk for hereditary breast cancer has found that magnetic resonance imaging (MRI) was superior to mammography in early detection of tumors in women with mutations in the *BRCA* genes or at high risk for cancer because of family history. The study did not look at MRI as a standard screening technique for all women, but rather only those considered at risk.

Researchers evaluated the long-term results of screening 2,157 women at risk for hereditary breast cancer - including separate analyses of 599 *BRCA1* and *BRCA2* mutation carriers - in addition to examining survival. In the study, women with a cumulative lifetime risk (CLTR) for breast cancer greater than 15 percent were screened for cancer using biannual clinical breast examination and annual mammography and MRI. Participants were divided into three subgroups: those who carried a gene mutation and had a 50 percent to 85 percent CLTR and two groups with a family history of breast cancer without a known gene mutation, including those considered at high risk (30 percent to 50 percent CLTR) or at moderate risk (15 percent to 30 percent CLTR). The median follow-up time was 4.9 years from study entry.

The investigators found that mammography was more than twice as sensitive in detecting cancer in *BRCA2* mutation carriers (61.5 percent) than in *BRCA1* mutation carriers (25.0 percent), and that MRI was better than mammography in detecting cancer in *BRCA1* mutation carriers (66.7 percent). MRI was slightly more sensitive in *BRCA2* mutation carriers (69.2 percent).

Mutations in *BRCA1* or *BRCA2* genes can be found in approximately 25 percent of women with a family history of breast cancer. Previous studies had shown that MRI screening appeared to be about twice as sensitive as mammography screening in detecting tumors in women with a susceptibility to breast cancer. While most screening guidelines now recommend MRI screening in *BRCA1* and *BRCA2* mutation carriers, there is no consensus regarding the best screening protocol for all at-risk groups with respect to the four screening methods - mammography, MRI, ultrasound and clinical breast examination, and little agreement on which at-risk groups should be screened.

The study was also the first prospective report on mortality in these groups of women who underwent this screening protocol. Investigators found low mortality; only four women with invasive breast cancer, all with a *BRCA1/BRCA2* gene mutation, died after a median of five years after diagnosis. They also showed that 6 years after diagnosis, there was an overall survival of 93 percent in 42 *BRCA1/BRCA2* mutation carriers who developed invasive breast cancer during screening, an improvement compared to the 74 percent overall survival of patients in 26 previous studies (median follow-up of 5 years) screened only with mammography or not screened at all.

The authors suggest that changes in screening recommendations may be considered for *BRCA1* mutation carriers - including a possible biannual MRI - in addition to the use of newer adjuvant therapeutic regimens and future targeted therapies. The study results also support the use of MRI screening in other risk groups without a *BRCA1/BRCA2* mutation.

What this Means for Patients

Women with a genetic predisposition to developing breast cancer have a higher-than-normal lifetime risk for the disease. While this breast cancer risk can be reduced with prophylactic surgery or chemoprevention, a promising strategy to reduce the risk of dying from breast cancer is early diagnosis through careful screening. A new, long-term study of women at increased risk for hereditary breast cancer has shown that magnetic resonance imaging (MRI) is superior to mammography for early detection of tumors in women with mutations in the *BRCA* genes or at high risk for cancer due to family history. While MRI is already recommended for screening high-risk women with such gene mutations, the researchers suggest that more frequent use of MRI in these and other high risk groups may be beneficial.

Helpful Links

[Hereditary Breast and Ovarian Cancer](#) [2]

[Magnetic Resonance Imaging \(MRI\): What to Expect](#) [3]

Links:

[1] <http://www.jco.org/>

[2] <http://www.cancer.net/patient/Cancer+Types/Hereditary+Breast+and+Ovarian+Cancer>

[3] <http://www.cancer.net/patient/All+About+Cancer/Cancer.Net+Feature+Articles/Cancer+Screening+and+Prevention/Magnetic+Resonance+Imaging+%28MRI%29%26mdash%3BWhat+to+Expect>