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Annual Breast MRI Urged for High-Risk Women

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Dec. 14, 2004 (San Antonio) — Women with a high risk of breast cancer, either as BRCA gene carriers or as members of families with high incidence of the disease, should be screened annually by breast magnetic resonance imaging (MRI), according to a leading Canadian researcher.

Ellen Warner, MD, MSc, FRCPC, FACP, a medical oncologist at the Sunnybrook & Women's College Health Sciences Centre in Toronto, Ontario, said research published this year shows MRI to be at least two to three times as sensitive as mammography in high-risk women. These patients are often younger and have denser breast tissue that obscures tumors on many mammograms, she said.

If MRI technology is not an option, Dr. Warner recommended backing up mammograms with annual ultrasound studies. "Ultrasound in addition to a mammogram — it's not as good [as MRI], but it's better than a mammogram," she said in a plenary lecture here at the 27th annual San Antonio Breast Cancer Symposium.

She based her conclusions on two published studies. The first was a large Dutch trial by Mieke Krieg and colleagues, which was published in the July 29, 2004, issue of the *New England Journal of Medicine*. Of a total of 1,909 enrolled women, 358 were mutation carriers. The study found 45 cancers in the total population, half of them were in mutation carriers, and 39 were invasive. The study reported sensitivity of individual modalities to be 71% for MRI, 40% for mammography, and 18% for clinical breast examination (CBE).

Dr. Warner noted that the trial also found MRI to be better than mammography at finding the invasive breast cancers that are more common in high-risk women. The study calculated sensitivity for invasive breast cancer to be 80% for MRI and 33% for mammography. In contrast, mammography was dramatically more sensitive to ductal carcinoma in situ: 84% compared with 17% for MRI.

In a second single-center study by Dr. Warner and colleagues, which was published in the Sept. 15, 2004, issue of *JAMA*, her group compared four screening modalities in a smaller population: 437 patients, of whom 318 were BRCA mutation carriers. A total of 37 cancers were found; 32 occurred in BRCA carriers and 28 were invasive.

With more high-risk women in the population, the sensitivity of MRI increased to 84% while the sensitivity of mammography decreased to 30%, according to Dr. Warner. Ultrasound's sensitivity was 33%, she said, and CBE was the least sensitive at 8%.

When all the modalities except CBE were combined, the researchers calculated sensitivity to be 97%. With just mammography and CBE it decreased to 38%. If mammography, ultrasound, and CBE were used but not MRI, sensitivity was 57% — better, but not as good as MRI.

Although more cancers were found in the first year of MRI screening, Dr. Warner said smaller cancers were detected in years 2 and 3. The price of better detection with MRI, she added, was more false-positives: 19% in the first year and 9% in the second through fifth years.

Dr. Warner predicted that the greater number of cancers caught and cured would make annual MRI screening cost-effective if confined to high-risk patients. She estimated the cost of screening 620,000 women annually in the U.S. to

be \$744 million per year based on \$1,200 per MRI. If 1% of these women have cancer and mortality is cut from 30% to 10%, 1,240 more could be cured, she said, and 31,000 life-years saved.

"MRI for high-risk women is the most sensitive screening modality," she concluded. Still to be resolved, Dr. Warner said, is its impact on overall survival, the age at which annual MRI screening should be started, and the age at which it should stop.

Along with increasing the use of MRI, ensuring that the technology is used well will also be critical to effectiveness, Dr. Warner told Medscape. "Experience is also really important. Not all MRIs are competently evaluated. The experience of the reader makes a big difference," she said.

According to Sheldon Feldman, MD, FACS, from Beth Israel Medical Center Cancer Center in New York City, "[Use of MRIs in high-risk cases] is not new for us, but I think the concept is being validated by the trials." He said his center has done MRI routinely in high-risk cases for several years, and he agreed that the experience and capability of the center doing the MRI can be critical.

Beth Israel has had patients referred, Dr. Feldman said, because the original center had difficulty interpreting its own MRI and did not have the technology to follow-up with an MRI-guided biopsy. "A center has to have very good software to do an MRI-guided biopsy," he said.

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Reviewed by Gary D. Vogin, MD
