What to Do if Breast MRI Isn't a Screening Option

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SAN ANTONIO — Combining annual breast ultrasound with mammography and clinical breast examination is the next best option when MRI isn't available for screening a woman at high hereditary risk of breast cancer, Ellen Warner, M.D., said at a breast cancer symposium sponsored by the Cancer Therapy and Research Center.

Annual breast MRI is clearly the best approach in screening high-risk women. In the two prospective comparative trials reported to date—the Dutch national study and a large single-center trial led by Dr. Warner at Sunnybrook and Women's College Health Sciences Centre, Toronto—annual MRI for detection of early breast cancer displayed a sensitivity of 71% and 84%, respectively.

In contrast, annual mammography—the cornerstone of current U.S., French, and U.K. national guidelines for screening high-risk women—had a sensitivity of just 40% as a solo screening modality in the Dutch national study (N. Engl. J. Med. 2004;351:427-37) and 30% in the Toronto study.

The Toronto investigators found, however, that by adding an annual breast ultrasound on the same day as mammography and clinical breast examination, the sensitivity climbed to 57%. This is not nearly as good as MRI, but markedly better than mammography plus clinical breast examination, which had a sensitivity of just 38%.

Best of all was the combination of annual MRI, mammography, and ultrasound. It had a sensitivity of 97% in the ongoing 437-woman study that included 318 breast cancer mutation carriers. A total of 37 cancers was found. Dr. Warner provided updated findings from the study, the earlier results of which were previously published (JAMA 2004;292:1317-25).

"Without clinical breast examination we wouldn't have missed a single cancer. Mammography and ultrasound each found two cancers not found by any other modality; without either one of those tools the sensitivity would have dropped to 92%. Omit MRI and the sensitivity drops to 57%," the medical oncologist said.

Screening women who are at high hereditary risk for breast cancer poses two major challenges: It has to start at a very young age, because a 30-year-old *BRCA1* mutation carrier has the same annual risk as a 60-year-old woman in the general population. And a very high-sensitivity screening tool is required.

"If we screened 100 women in the general population with a screening regimen with a sensitivity of 80%, we would only miss two cancers. If we screened 100 *BRCA1* mutation carriers with a regimen with the same sensitivity, we'd miss 13," she explained.

The price to be paid for MRI's outstanding sensitivity has been a high false-positive rate. In the Dutch study, MRI generated nearly three times more false-positive breast biopsies than did mammography. But MRI experts are well along in developing novel screening protocols expected to greatly reduce that problem, according to Dr. Warner.

The Dutch and Toronto studies are among six prospective studies evaluating the usefulness of screening MRI in high-risk women that were launched in North America and Europe in the mid- to late-1990s. They were constructed so that upon completion they will be amenable to metaanalyses.

The next phase of the Dutch and Toronto studies will examine whether screening MRI confers a survival benefit. The expectation is that it does, because it detects significantly smaller, lower-stage cancers than does mammography.

Dr. Warner offered "a guesstimate" of screening MRI's cost benefit, with the large caveat that there are no survival data yet. She assumed that MRI screening reduces breast cancer mortality from 30% to 10%, and that survivors live an average of 25 additional years. Given those assumptions, annual MRI screening of the estimated 620,000 high-risk American women aged 30-60 years at a cost of $1,200 per scan would cost $24,000 per year of life saved.

"Since up to $50,000 per year of life saved is considered an acceptable cost for medical interventions, even if I've overestimated the benefit of MRI by a factor of two, the cost is still reasonable," she said. ■

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