Detector Mismatch Raises Radiation Exposure

BY PATRICE WENDLING

FROM THE ANNUAL MEETING OF THE RADIOLOGICAL SOCIETY OF NORTH AMERICA

CHICAGO – A mismatch between breast size and detector size during mammography resulted in significantly higher doses of radiation for women with large breasts in a study of 886 patients.

On average, women with large breasts screened on a small detector received almost 5 milligray (mGy) of radiation, which exceeds the American College of Radiology guidelines of 3-4 mGy or less for a standard two-view mammogram. When a mismatch occurs, women with large breasts receive significantly higher doses of radiation than women with small breasts or their counterparts with large breasts correctly matched to a large detector, Dr. Cathy Wells said when presenting the award-winning study at the meeting.

"Women with large breasts should be imaged with a large detector to avoid an unnecessary increase in radiation dose," she urged.

The quality assurance study involved 886 women who presented for screening or diagnostic mammography during a 6-week period in late 2009. The exams were performed with a phosphor charge-coupled device detector, which is available in pre-set sizes (large or small) due to manufacturing constraints, she said. Insufficient data for 22 patients left 426 screening and 438 diagnostic patients evaluable for analysis.

VITALS

Major Finding: Screening mammogram patients with correctly matched breast and detector sizes received an average mean glandular dose per breast of 3.3 mGy vs. 4.9 mGy for mismatched patients with large breasts (*P* value less than .05).

Data Source: Quality assurance study in 886 mammography patients.

Disclosures: Dr. Wells and her coauthors reported having no conflicts of interest.

A sizeable number, or almost 20% of patients, were affected by a mismatch between breast and detector size, said Dr. Wells, who completed the study at Beth Israel Deaconess Medical Center and is now a breast imaging fellow at Massachusetts General Hospital, both in Boston.

The percentage of mismatches varied from 10% of screening patients with large breasts, defined as a "C" cup or larger, to 27% of screening patients with small breasts imaged with a large detector. A mismatch occurred in 22% of diagnostic mammography patients with large breasts and 17% of diagnostic patients with small breasts.

Despite the sizeable number of mismatches in the study, not all women will be faced with this problem when they arrive for their mammogram, Dr. Wells said in an interview. The phosphor charge-coupled device detector is one of four types of digital detectors currently available in the United States, and to her knowledge the only type that has such size constraints. In addition, not all imaging centers use this detector type.

Some centers, including her own, have both large- and small-size detectors available, although there can be a wait for the proper size, she noted. Women can choose to wait or be imaged with a different detector after a discussion with the technologist.

"The best option for women to ensure a correct match between breast size and detector size would be to talk with the technologist who performs the actual mammogram, [as] the scheduler or person at the check-in desk will likely not know the answer," Dr. Wells said.

"Women could ask the technologist whether the detector comes in different sizes, since not all do, and if so, whether they are correctly matched."

Screening mammogram patients with correctly matched breast and detector sizes received an average mean glandular dose per breast of 3.3 mGy, compared with 4.9 mGy for mismatched patients with large breasts.

This was due to significantly more views obtained in mismatched patients with large breasts, compared with both the large-breast patients imaged on a large detector and small-breast patients imaged on a small detector (mean 5.9 views vs. 4.6 views vs. 4.7 views), Dr. Wells said. Interestingly, small-breast patients mismatched to a large detector underwent a similar number of views at a mean of 4.6, but actually received slightly less radiation at mean dose of 2.9 mGy.

During diagnostic mammograms, the radiation dose was again significantly higher among mismatched patients with large breasts, compared with the correctly matched large- and small-breast groups (8.2 mGy vs. 6.7 mGy , but it did not appear to be related to the number of views obtained, she said, adding that other factors must be at work. Several variables contribute to radiation dose, but in this case, the most likely culprit is compression thickness, Dr. Wells said. "It may be more difficult to adequately compress a large breast with a small detector, resulting in a larger radiation dose," she said. "We hope to analyze the data again, to answer this question." ■

Adjuvant Breast Cancer Vaccine in Phase III Trial

BY BRUCE JANCIN

FROM THE SAN ANTONIO BREAST CANCER SYMPOSIUM

SAN ANTONIO – A phase III trial of an adjuvant breast cancer vaccine began enrollment before the end of 2011 as a result of favorable 5-year efficacy and safety data in a phase II study.

In updated phase II results, disease-free survival at a median follow-up of 60 months was 95.9% in 53 patients who received the E75 vaccine with multiple booster inoculations, significantly better than the 79.7% figure in 79 controls, Dr. Timothy J. Vreeland reported at the meeting .

The vaccine, known as NeuVax, is composed of the E75 peptide, which is derived from human epidermal growth factor receptor 2 (HER2), mixed with granulocyte macrophage colony-stimulating factor (GM-CSF). The vaccine has previously been shown to stimulate cytotoxic T cells to specifically target cells expressing HER2.

As a result of lessons learned in the randomized phase II study, the phase III trial will be restricted to patients with lymph node–positive tumors who are clinically disease-free after completing standard therapy. Only patients with low levels of HER2 expression, meaning immunohistochemistry 1+ or 2+, will be eligible.

The E75 vaccine was initially given as an intradermal injection once a month for 6 months. Because of waning immunity noted during phase I and II testing, however, a booster immunization program was initiated. It consists of a booster injection once every 6 months. The booster program will be routine in the phase III trial.

The overall phase II study population consisted of 187 patients with node-positive or high-risk node-negative tumors expressing any level of HER2. The median 5-year disease-free survival in the 108 patients in the vaccine arm was 89.4%, compared with 79.7% in controls, a nonsignificant difference. But the vaccine arm included 55 women who didn't receive booster immunizations. When they were excluded, the 5-year disease-free survival rate climbed to 95.9%, according to Dr. Vreeland, a U.S. Army captain at San Antonio Military Medical Center.

The phase III trial is called PRESENT (Prevention of Recurrence in Early-Stage, Node-Positive Breast Cancer with Low to Intermediate HER2 Expression with NeuVax Treatment).

The NeuVax vaccine has been licensed by the U.S. military to Galena Biopharma. Dr. Vreeland delared having no relevant financial disclosures. ■

Breast Ca Risk Not Worse for Noncarriers in BRCA Families

BY MARY ANN MOON

FROM THE JOURNAL OF CLINICAL ONCOLOGY

Women who don't carry their family's BRCA1 or BRCA2 mutation showed no increase in breast cancer risk in a study of 3,047 population-based families reported .

"These results support the standard clinical practice of advising noncarriers that they do not have any increase in breast cancer risk attributable to the family-specific BRCA mutation and, in the absence of other strong risk factors, should follow general population guidelines for breast cancer screening," said Dr. Allison W. Kurian of Stanford (Calif.) University and her associates.

Some recent studies have suggested that noncarriers of a family-specific mutation may have a two- to fivefold increase in risk of developing breast cancer, compared with the general population. While lower than the 5- to 20-fold increase in risk for carriers of the mutation, this rate would still be high enough to warrant breast cancer surveillance. Other studies have found no increase in risk among noncarriers.

To clarify the issue, Dr. Kurian and her colleagues assessed breast cancer risk using population-based cancer registries in the United States, Australia, and Canada. They identified 3,047 families in which one woman (the proband) was diagnosed as having breast cancer at a relatively young age, in most cases during 1996-2000, and she and her female first-degree relatives underwent genetic testing for BRCA1 and BRCA2 mutations.

Overall, 160 families had BRCA1 mutations and 132 had BRCA2 mutations, the investigators reported (J. Clin. Oncol. 2011 [doi:10.1200.JCO.2010.34.4440]).

Among noncarriers of family-specific mutations, the risk of developing breast cancer was not significantly higher than the risk among women in 2,755 families without any BRCA1 or BRCA2 mutations. This relative risk was 0.39.

It is possible that previous studies reporting an increased risk in noncarriers have overestimated this risk, because they compared study subjects with women in the general population rather than women whose relatives have breast cancer. The latter group undergoes more frequent screening and consequently has more frequent diagnoses of breast cancer than women in the general population, Dr. Kurian and her associates noted.

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