

Addition of ultrasound to mammography in the case of dense breast tissue: a meta-analysis

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Background

Women with dense breast tissue have a higher risk of breast cancer while their cancers are more easily missed by mammography. This meta-analysis synthesised the available evidence on supplementing mammography with ultrasound in screening of these women, focusing on the additional detection of breast cancers and recalls for assessment.

Methods

We searched PubMed for studies of women with dense breasts undergoing screening with ultrasound and mammography, published from 2000 onwards. Studies had to report data in sufficient detail to calculate a relative detection/recall rate and its standard deviation. All three authors independently screened the abstracts and retrieved the study information into pre-specified tables. The quality of the studies and their reporting was evaluated using the QUADAS-2 framework. Statistical analysis was undertaken using STATA.

Results

Of the retrieved 716 references, 182 were selected for full-text reading. Thirteen studies with 1884 cancers detected on either screening modality met the inclusion criteria; 9 studies observed the general population of women with dense breasts, whereas in 4 studies women had additional risk factors. Preliminary analyses suggest that the addition of ultrasound to mammography increases the detection of breast cancer by 37% (95% CI: 32-41), with the estimate varying between 7 and 160% in individual studies. The recall for assessment approximately doubled (relative rate: 2.03, 95% CI: 1.97-2.10), based on two studies. Several other studies reported only false positive rates or biopsy rates, and all indicated an approximate doubling. QUADAS-2 analysis revealed some issues in terms of the risk of bias and applicability in patient selection and index tests.

Conclusions

This meta-analysis suggests that the additional assessment burden from ultrasound examinations might be tolerated against the additional yield of cancers. Nevertheless, the review revealed significant differences in study designs, and no study evaluated a potential reduction in the mortality from breast cancer.