

EDITORIALS

The harms and benefits of modern screening mammography

Women need more balanced information

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The Swiss Medical Board, an independent health technology assessment consortium, recently reviewed the evidence for breast cancer screening and made recommendations to its government. The board noted that the current debate on the benefits and harms of mammography screening is based on outdated randomised controlled trials (RCTs) and that it was “non-obvious” that the benefits outweighed the harms.¹ They recommended that no new mammography screening programmes should be introduced in Switzerland and that the existing ones should be phased out.¹

The Swiss Medical Board relied on a review by another panel: the Independent United Kingdom Panel on Breast Cancer Screening.² Using data from the published RCTs, the UK panel estimated that for every 10 000 women aged 50 invited to screen for the next 20 years, about 43 would avoid a death from breast cancer and the remaining 9957 would receive no mortality benefit. About 129 women would be treated unnecessarily as a result of overdiagnosis, a ratio of three women with overdiagnosed cancers to one woman with a breast cancer death avoided.

As both panels noted, data from older RCTs are not ideal for determining the benefits and harms of modern day screening. Instead, observational studies such as in the linked paper (doi:10.1136/bmj.g3701) will be increasingly relied on to monitor changes over time.³

Much has changed since women were first enrolled into the breast cancer screening RCTs, one of which started 50 years ago, including factors that influence the incidence of breast cancer (for example, postmenopausal hormone therapy and increased obesity) or the timing of diagnosis (for example, improved mammography technology and increased breast cancer awareness). Most importantly, breast cancer treatment has noticeably improved, and this may partially explain some of the benefit attributed to mammography. Recent findings from the 25 year follow-up of the Canadian National Breast Screening Study underscore uncertainties about the applicability of the older RCTs to current screening policies. That study showed

no benefit from screening, perhaps partly due to participants receiving more effective treatment than in the older RCTs.⁴

Some commentators have asked for new trials, but results would take decades and it would still be questioned whether further changes in risk factors, treatment, and technology over these decades had made the RCT results obsolete.

The new cohort study from Norway³ adds important information to a growing body of observational evidence estimating the benefits and harms of screening. The authors followed women for more than two decades during a time when the country’s breast cancer screening programme was gradually implemented. They found that, for every 10 000 women screened, about 27 deaths from breast cancer might be avoided.

Although observational studies may provide more up to date estimates than the old RCTs, they also come with considerable uncertainty. As these studies compare groups in different periods (before and after screening programmes begin) or in different geographical areas (with and without screening programmes), they are susceptible to selection bias.⁵ It is not surprising that observational studies in Norway and other Scandinavian countries have disagreed about the estimated mortality benefit of screening mammography.^{6 7 8 9} The benefit reported in the present study falls near the middle of these other published estimates.

Overall, evidence from both observational studies and RCTs indicates a benefit from screening mammography. Interestingly, the estimates from the observational studies do not differ greatly from those of the older RCTs: for every 10 000 women screened over 20 years, an estimated 27 versus 43 women, respectively, would avoid a breast cancer death. The Norwegian study largely confirms what is already known: the benefits of screening mammography are modest at best. While the benefits are small, the harms of screening are real and include overdiagnosis, psychological stress, and exorbitant healthcare costs.

So how can women be helped to make informed decisions about screening? Unfortunately they are rarely presented with balanced information. While the results of complex, imperfect science

do not easily translate into memorable slogans, campaigns to promote mammography do often catch women's attention. Many individuals and groups actively promote mammography screening. Doctors discussing mammography with patients are more likely to mention the potential benefits than harms of screening.¹⁰ One US hospital promotes monthly "mingle and mammograms" parties, with women being pampered before screening to calm their nerves.¹¹ These parties include appetizers, foot massages, and bags emblazoned with the logo "fight like a girl." In addition to appetizers, we suggest serving women balanced information about the benefits and harms of screening to chew on.

Concern about the amount and type of information on screening mammography made available to women is increasing internationally. In the United Kingdom, concerns about women receiving inadequate information when participating in their national screening programme led to the formation of a special "citizen's jury" of women to review the issue.^{12 13} After hearing evidence from experts, the jurors made recommendations on the best way to present information on the benefits and harms of mammography. Based on this experience, one participant remarked: "I can't believe how much I didn't know."¹⁴

Beyond its relevance to women's decision making today, the Norwegian study should make us reflect on how to monitor the changing benefits and harms of breast cancer screening. Future studies will hopefully allow analyses to account for changes over time in risk factors, screening technology, and treatment. Just as quality criteria have been defined for RCTs, creative study methods and quality metrics must be developed for observational studies evaluating large screening programmes.

For future independent boards to be able to conclude that the breast cancer screening decision has finally become obvious, careful assessment of ongoing screening programmes will be required. In the meantime, make yourself comfortable—this may take a while.

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