

Commentary: Screening mammography: a decision analysis

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Arguments over the credibility of the randomized screening mammography trials are red herrings. The overall results of the trials suggest that screening very likely reduces breast cancer mortality. Despite some peccadillos of the trials, I agree with the overall conclusion. I always have. So why have I been painted as being anti-screening? It is because I am less enthusiastic about the consequences of screening than are most medical researchers. And I believe that it is essential for women to understand and take into account the risks as well as the potential benefits of screening.¹ Regular screening may be a rational choice for some women and not for others.

Estimated reductions in breast cancer mortality due to screening are modest. For example, the most positive results have been from the five randomized trials that were conducted in Sweden. Because of the evaluation bias,¹ the most appropriate assessment is via a so-called 'follow-up analysis'. Recent results of these trials² indicate that regular screening reduces breast cancer mortality by an estimated 11% for women aged 40–60 years. This is a relative risk reduction, which is meaningful statistically but has little relevance for women deciding whether screening is right for them. A better measure for use in decision making is absolute risk. An example measure of absolute risk reduction is the expected increment in life for a woman who gets regular screening. In the Swedish trials the average additional life per woman in her 40s or 50s (out to 18 years after randomization) was about 3 days. Comparable average increments in expected additional life could be achieved by, for example, losing an ounce of body weight (and keeping it off) or wearing a helmet for 10 hours of bicycling.³

There are good reasons to think that this 11% reduction is an underestimate. One is that the design of the Swedish trials diluted any true benefit for screening. Consider a woman assigned to screening in the Gothenburg trial. She was scheduled to have five mammograms at 18-month intervals, over a period of 6 years. A woman in the control group was scheduled to have a mammogram as well, one timed to coincide with the screened woman's fifth mammogram at 6 years after randomization. After the sixth year, both women got mammograms or not as they wished. So the comparison was a prescription of five mammograms versus a prescription of one mammogram rather than screening versus not. Another reason is that not every woman in the 'screening' group in fact got screened. A third reason why the 11% figure may be an underestimate is that the Swedish trials were conducted in the 1980s and mammographic technology has improved since then.

Whether big or small, a benefit is a benefit. The problem is that achieving the benefit has a cost. There are several important risks of screening. About 8% of screening mammograms in the US are found to be abnormal, but fewer than 10% of women with abnormal mammograms have breast cancer. Women who get 10 annual mammograms have about a 50% chance that at least one of them is a false positive. False positives are associated with anxiety and extra procedures. About 1 in 4 false positives entails a biopsy. Taking a chance at experiencing unnecessary anxiety and surgery may well be worthwhile. But this chance is properly viewed as a price paid to achieve the benefits.

There are other important risks. One is the risk of overdiagnosis and the associated extra surgery and therapy. The age-adjusted incidence of breast cancer—including duct carcinoma *in situ* (DCIS)—in the US has increased by more than 50% since the advent of widespread screening mammography. An increased chance of being diagnosed with breast cancer and of receiving the associated therapy is worthwhile to the extent that screening is beneficial. But as in the case of false positives, its negative aspects are properly viewed as prices paid to achieve the benefits.

The other risks of screening mammography may be less important, depending on the woman. They include inconvenience, pain, and monetary cost.

We should help women weigh the benefits and risks of screening. It is convenient to have a metric. One that I suggested above is expected days of life. Consider a 50-year-old woman. Being generous on the benefit side, annual screening might prolong her life by an average of 10 days. Each of the risks listed above can be evaluated in terms of equivalent days of life and the resulting assessments summed. It is easy to imagine that the sum will be a lot less than 10 days for a particular woman. But it is also easy to imagine that it will be greater than 10 days for another woman.

Quantifying risks in this fashion may not be helpful to all women. But the simple process of listing the pros and cons on two sides of a ledger is likely to be informative. As is true for any intervention, we should work hard to inform women about the benefits and risks of screening mammography. And we should support their decisions.

References

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