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CORRESPONDENCE

Effect of Screening Mammography on Breast Cancer Incidence

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To the Editor:

As Bleyer and Welch report (Nov. 22 issue),[1] screening mammography has had a limited effect on breast cancer mortality in the United States; over the course of 30 years, age-adjusted incidence rates of late-stage cancers have decreased by only 8%, and no significant change is noticeable in the incidence rates of cancers diagnosed after they have metastasized to distant organs. Similar studies in the United Kingdom, the Netherlands, Italy, Switzerland, Norway, and Australia have shown limited decreases, if any, in the incidence of advanced breast cancers after 15 to 20 years of widespread screening.[2-4] Hence, it seems that everywhere it has been introduced, the effectiveness of screening mammography has been marginal. However, randomized trials of screening mammography have also reported reductions in the risk of death from breast cancer that were directly correlated with reductions in the risk of receiving a diagnosis of advanced breast cancer.[5] It is therefore important to understand why such a discrepancy in results exists between randomized mammography trials and general population screening. One hypothesis deserving further investigation is that in trials, factors other than screening mammography may have contributed to the reduction in the numbers of women receiving a diagnosis of advanced breast cancer.

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No potential conflict of interest relevant to this letter was reported.

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To the Editor:

Bleyer and Welch found that 31% of all breast cancers in the United States are overdiagnosed, which corresponds to a rate of overdiagnosis of 45% (31%÷69%=45%). The authors did not have a contemporary control group including women in the same age range as those in the study (over 40 years) who had undergone screening. Denmark has a unique control group, since screening was offered to only 20% of the population for 17 years, becoming nationwide in 2007. In reviewing the data from the period preceding 2007, we found 33% overdiagnosis after 12 years,[1] in good agreement with the U.S. results, as we have lower recall and participation rates. In our systematic review of other countries with organized screening programs, we found that the risk of breast cancer had increased by 52%, indicating that one third of breast cancers had been overdiagnosed.[2] Thus, it is clear that screening leads to tremendous harm, whereas it has not been shown that screening increases women's longevity.[3] We agree with the former leader of the Norwegian screening mammography program that screening cannot be justified for any age group.[4] The most important aspect of dealing with cancer is to reduce its incidence. By avoiding screening, women can reduce their risk of breast cancer by one third.[2]

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No potential conflict of interest relevant to this letter was reported.

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To the Editor:

I agree with Bleyer and Welch that the overdiagnosis of breast cancer is a serious problem. However, I would suggest an important modification to their analysis. In their article, Figure 2 nicely shows that the incidence of regional disease per 100,000 women decreased from 85 in 1976 to 76 in 1996, then rose sharply back to 85 in 2002, before falling to 77 in 2008. The sharp increase between 1996 and 2002 is almost certainly related to the concurrent adoption of sentinel-lymph-node biopsy. Randomized trials,[1,2] numerous clinical series,[3] and epidemiologic analysis of the data from the Surveillance, Epidemiology, and End Results (SEER) Program[4] have all shown that biopsy of the sentinel lymph nodes is associated with an increase in the incidence of regional-node involvement of 20 to 35%, predominantly because of increased detection of micrometastases. If a correction is made for this major change in methods, overdiagnosis falls slightly, from 31% to 28%, and the size of the reduction in late-stage disease increases, from 8% to 16%. The conclusion remains that women must weigh the benefits and harms of mammography, but a doubling of the benefit makes this choice more appealing.

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No potential conflict of interest relevant to this letter was reported.

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To the Editor:

Bleyer and Welch's flawed analysis is misleading and greatly exaggerates the overdiagnosis of breast cancer. The analysis inappropriately identifies ductal carcinoma in situ (DCIS) as an invasive cancer. The authors use the period 1976 through 1978 to estimate a 0.25% annual increase in breast-cancer incidence. However, 40 years of recorded data show that the actual increase is 1% per year.[1] Had they analyzed invasive cancers alone, used a valid baseline of an annual increase of 1%, and then compared their results with SEER data, they would have found fewer invasive cancers than predicted.

Data from eight prospective, randomized trials and multiple large population-based reports show a reduction of 25 to 30% in breast-cancer mortality among women in the screening group as compared with the control group. The benefit is even greater among women who actually undergo screening (all women assigned to screening in a randomized trial do not necessarily receive screening). Mammography use was not measured in the SEER data used by the authors. Consequently, their “assessment” of mammography is not based on the actual use of imaging, and the title of their article is misleading. A reasonable discussion of the benefits and risks of mammography is welcome, but the use of estimates and assumptions instead of real-world data leads to dubious conclusions that are potentially dangerous.

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No potential conflict of interest relevant to this letter was reported.

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1

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Author/Editor Response

We suspect that the discrepancy described by Autier and Boniol is largely explained by the increase in breast-cancer awareness that has occurred during the 30 to 50 years since the initiation of the randomized trials. Women now widely recognize the significance of a new breast lump and the need for diagnostic mammography. Ironically, increased awareness confers less opportunity for screening mammography to reduce the incidence of advanced cancer.

As pointed out by Jørgensen and Gøtzsche, our estimate of the magnitude of overdiagnosis in the United States is similar to that reported in other countries. We agree that women should understand that screening raises their risk of becoming a patient with breast cancer and that there is uncertainty about the benefit of screening. The assessment of how to cope with that uncertainty, however, remains a value judgment that we believe should be left to women and their doctors.

Lannin attributes the increase in regional disease from 1996 through 2002 to sentinel-lymph-node biopsy. Were this the case, however, another factor would be required to explain the return to the pre-1996 baseline (Figure 1, lower curve), since the practice of sentinel-lymph-node biopsy has continued (if not increased). Hence we ascribed the rise and fall in disease to the era of hormone-replacement therapy.

FIGURE 1

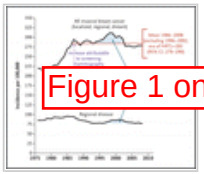

Figure 1 on next page

Annual Age-Adjusted Incidence of All Invasive Breast Cancer and of Regional Disease in Women 40 Years of Age or Older, 1976 to 2008.

We are disappointed by the comments from the leadership of the mammography community. They reiterate three “talking points” that were voiced after our report was published. First, we undercorrected for an underlying incidence trend of invasive cancer. Since 1986, there has not been an obvious increase in the incidence of invasive cancer (Figure 1, upper curve). Even if we had used their number — based on data from Connecticut in the years 1940 through 1980 — we would still estimate that from 1979 through 2008 and in 2008 alone, there was an overdiagnosis of breast cancer in 878,000 and 34,000 women, respectively. Second, it was stated that our data do not reflect the real world. We would argue that it is hard to get more “real” than three decades of data from the world's preeminent cancer surveillance program. Third, they say that DCIS should have been excluded. How could we estimate overdiagnosis without including an abnormality that is essentially detected only with mammography and is treated as cancer? And yet the authors of this letter characterize our research as “dangerous.”

We are disappointed because to mitigate the problem of overdiagnosis, primary care practitioners, surgeons, oncologists, and the public health community will all need the help of our colleagues in mammography. And the first step in addressing any problem is to acknowledge it.

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Since publication of their article, the authors report no further potential conflict of interest.

Annual Age-Adjusted Incidence of All Invasive Breast Cancer and of Regional Disease in Women 40 Years of Age or Older, 1976 to 2008.

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