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Mammography no better than physical breast examination, study shows

Careful physical breast examination is as effective as screening mammography in reducing mortality from breast cancer in women aged over 50, according to a controversial new study (*Journal of the National Cancer Institute* 2000:92:1490-9).

The second Canadian national breast screening study found that mammography detected breast cancers earlier than physical breast examination, but surprisingly, earlier detection did not translate into a survival advantage.

The Canadian study, led by Dr Anthony Miller and colleagues at the University of Toronto, followed 39 405 women aged 50-59. Only women who were not pregnant, had no history of breast cancer, and had not had mammography within the previous 12 months were eligible for enrolment.

The women were recruited from six provinces and 15 medical centres between 1980 and 1985 and were randomised into two arms: 19 711 women received both mammography and physical breast examinations by nurses or doctors, and 19 694 women received physical breast examinations alone.

All the women were taught to examine their breasts and were followed via record linkage with the Canadian national cancer registry and the national mortality database to 31 December 1993. Additionally, women with breast cancer were actively followed up until 30 June 1996. The follow up period averaged 13 years, with a range of 11-16 years.

Four to five annual examinations were offered to the study participants. The physical breast examination entailed a 10 minute physical and visual inspection. Nurses carried out the physical examination in 12 of the 15 medical centres.

Mammography was accomplished with a two view film screen technique using craniocaudal and mediolateral views before 1985 and mediolateral oblique and craniocaudal views thereafter. A random sample of the films was reviewed by a single reference radiologist.

Women with suspicious physical or mammographic findings were evaluated by study surgeons, who made appropriate recommendations to the patient's personal physicians.

The researchers found that, although mammography clearly detected cancers earlier than physical examination alone and was more sensitive in finding smaller cancers and in situ carcinomas, some of these advantages disappeared with longer screening.

Moreover, early detection did not translate into a reduction in mortality. At the initial screening, mammography plus physical examination found almost twice (267) the number of cancers compared with physical examination alone (148)—7.2 breast cancers per 1000 patients compared with 3.45 breast cancers per 1000 with physical examination alone.

Overall, mammography plus physical examination yielded a 2.1 year lead time advantage over physical examination alone. However, this advantage disappeared with longer follow up, by which time 622 invasive breast cancers were found in the mammography group and 610 in the physical examination group.

In situ carcinomas continued to be picked up more readily with mammography, with 71 in situ carcinomas compared with 16 in the physical examination group.

By the end of the study, 107 women had died of breast cancer in the group receiving mammography plus physical examination, compared with 105 in the group receiving physical examination alone. This represented a mortality rate ratio of 1.02 (95% confidence interval of 0.78 to 1.33).

The study results are somewhat surprising, as one might expect early detection to confer a survival advantage as earlier stage tumours (smaller tumours with less nodal metastases) are found.

The researchers surmised that advances in treatment may have equalised the survival curves in the study cohorts. Interestingly, the paper did not record subtypes for the tumours, so it is possible that there was an unequal distribution of aggressive tumour subtypes.

A recent report on the NHS breast screening programme (*BMJ* 2000;321:665-9) found a 6.4% reduction in mortality attributable to screening over treatment advances. However, this report did not detail screening method and, moreover, included both patients with a history of breast cancer and taking tamoxifen and patients without a history of breast cancer.

The Canadian study's authors suggest that careful physical breast examination may be a viable alternative to screening mammography in women aged over 50 who find mammography painful, unaffordable, or inaccessible or who fear the cumulative effects of radiation to the breast.

They emphasise that the research does not negate the power of mammography as a screening tool and that mammography clearly confers a survival advantage over no screening at all. Furthermore, they acknowledge that the breast physical examination given to participants in this study was decidedly more thorough than is usual.

Many in the cancer community are sceptical of the results. Dr Robert Smith, director of cancer screening for the American Cancer Society, said: "It would be tragic if these results persuade some women to stop getting mammograms."

Dr Smith also noted that this is the only study to show no survival advantage for screening mammography. He further criticised the study design and the quality of the mammography and radiologists.

"This is a study that has been criticised by the community of American radiologists as well as European radiologists for problems of randomisation, poor quality mammograms, and a lack of radiologists specifically trained to read mammograms. The limitations of this study, which were present from inception, do not disappear with additional years of follow up," he said.

Anticipating such criticism, the study authors stated: "We re-emphasise that [our] comparison of screening with mammography plus physical examination, and breast self examination alone is unique. We are not aware of any mammography screening trial that has shown a widening of benefit beyond 7-10 years after entry."