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Edinburgh breast screening trial, 14 year follow up

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Keywords

breast screening, mammography, breast cancer, mortality reduction, socioeconomic status

Introduction

The Edinburgh randomised trial of breast screening was set up in 1978 as part of the UK Trial of Early Detection of Breast Cancer (TEDBC). The aim of the Edinburgh trial was to investigate the effect on mortality of mammographic screening in combination with clinical examination. Women aged 45-64 years were recruited from 1978-1981 (cohort 1). Subsequently additional women aged 45-49 years were recruited (cohorts 2 and 3) during 1982-85. Screening was by biennial two-view mammography, with annual clinical examination. Control group women received only normal medical care. Previously, breast cancer mortality in these women has been reported with 7 and 10 years follow up: a 17-18% non-significant reduction was observed in the screened group. At 10 years, breast cancer mortality in women aged 45-49 at trial entry was 22% lower in the screening group.

Earlier results have been confounded by differences in socio-economic status (SES), women in the control group having lower SES and higher all cause mortality. Now an improved method of adjusting for differences in SES has been developed. Mortality after 14 years of follow up and after adjusting for SES can now be reported, relating to 270,000 women. This new method has also been used to examine the effect of screening younger women.

Aims

To report mortality following mammographic screening combined with clinical examination after 14 years of follow up and having adjusted for differences in SES. The effect of age at trial entry was also studied.

Comments

This trial shows screening women before age 50 years can reduce breast cancer deaths. However, these data were obtained in a research setting with a 2 year screening interval and annual clinical

examination. As stated by the authors, the decision to lower the age for first invitation to screening within the national screening programme should await results of the UK Age Trial and EUROTRIAL.

Methods

87 clinical practices within Edinburgh city were randomised to intervention and control groups. Women aged 45-64 years registered at practices randomised to intervention were offered biennial screening by mammography plus annual clinical examination. Women registered at control practices received only normal medical care.

Breast cancer mortality rates in the intervention group (28,628 women offered screening) were compared with those in the control group (26,026 women), with adjustment for SES by clinical practice. This adjustment involved devising a score for Carstairs index of deprivation for each woman by area of residence based on 1981 census data. Practices were then classified as high, medium or low SES. Rate ratios of breast cancer mortality were derived by logistic regression for the total trial population and for women aged less than 50 years at trial entry.

Results

Overall, 28,628 women aged 45-64 years at entry (including 11,479 women aged 45-49 years) were recruited at the screening centres and 26,015 (including 10,267 women aged 45-49 years) at the control centres. Initial unadjusted results for women aged 45-64 in the intervention group showed a 13% reduction in breast cancer mortality compared with control. Death rates for intervention versus control groups were 5.18 per 10,000 (156 deaths) versus 6.04 per 10,000 (167 deaths); rate ratio 0.87 (95% CI 0.70, 1.06). However, women in the intervention group had higher SES and lower all cause mortality than women in the control group. After adjustment for SES, the ratio became 0.79 (95% CI 0.60, 1.02) and differences between trial groups in other cause mortality were removed. There was some evidence in both trial groups of higher breast cancer rates with increased SES. To counteract the effect of inclusion of deaths which could not have been influenced by screening, deaths after diagnosis more than 3 years after study end were censored. The rate ratio became 0.71 (95% CI 0.53, 0.95).

There was little evidence of variation in mortality reduction by age group for the screened women, and no evidence of a reduced or delayed effect of screening in women aged under 50 years at trial entry [rate ratio 0.70 (95% CI 0.41, 1.20) for the initial cohort, and 0.75 (95% CI 0.48, 1.18) for all cohorts combined].

No screening associated mortality reduction was observed in women whose cancers were diagnosed before they reached age 50 years.

Discussion

A previous limitation of the results of this trial has been the difference in SES between intervention and control groups leading to higher all cause mortality in the control group. A new method of quantifying SES provides more accurate estimation of effects of screening on breast cancer mortality. The 25% mortality reduction after 14 years in screened women aged 45-49 years at trial entry agrees closely with most previous metaanalyses of randomised trials. Consistent with other studies eg HIP (USA) and the Swedish overview, the estimated benefit of screening is larger when deaths from diagnoses more than 3 years after end of trial were censored.

Additional information

Data from 16 years of follow up from the UK TEDBC are also reported in this issue of The Lancet.

References

1. Alexander FE, Anderson TJ, Brown HK,, Forrest AP, Hepburn W, Kirkpatrick AE, Muir BB, Prescott RJ, Smith A: 14 years of follow up from the Edinburgh randomised trial of breast cancer screening. Lancet. 1999, 353: 1903-1907.