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Impact of mammographic screening in New South Wales

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Introduction

Organised mammographic screening for breast cancer was introduced in New South Wales (NSW) Australia in 1988, starting with two pilot projects. Screening was extended throughout the state from 1991 with most areas covered by 1994. The goal of the programme is to reduce breast cancer deaths in the target age group (50-69 years) by 30%. As screening is introduced, a large increase in incidence of early breast cancers should be observed which should then be followed by a decrease in advanced cancer incidence. This in turn should lead to a reduction in mortality. An increase in the proportion of small tumours occurring after the introduction of screening has already been reported. Changes in advanced cancer incidence and breast cancer mortality rates are now presented.

Aims

To examine the uptake of mammographic screening NSW and to determine whether screening programme activity has been associated with a reduction in advanced breast cancer incidence and mortality.

Comments

Evaluating the population impact of a breast screening programme is essential in order to ensure that programme performance is optimal. The increase in early stage cancer and subsequent decrease in more advanced cancer seen following the introduction of screening are essential steps on the pathway towards mortality reduction. However, the study has been limited by the data available. A more complete evaluation of the potential impact of this programme on breast cancer mortality requires information on the prognostic characteristics of cancers classified according to their mode of detection (screen detected, cancers in non-attenders, interval cancers, etc). This would allow estimation of the contribution of screening to the observed mortality reduction.

Methods

Age specific and age standardised breast cancer incidence and mortality rates from 1972 to 1995 were calculated per 100,000 women using data from the NSW Central Cancer Registry and using the 1991 Australian population as standard. Age specific proportions of women who have undergone bilateral mammography were calculated and adjusted for estimated incidence of diagnostic mammography in order to estimate screening activity. Tumour size has been recorded by the Cancer Registry one year in three, starting in 1986. In 1995 it was recorded for around 49% of invasive tumours. Annual rates of breast cancer incidence by size (maximum diameter of invasive component, or largest invasive tumour in the case of multiple tumours) have been estimated using the appropriately adjusted population denominators.

Results

One year before the introduction of the screening programme, the proportions of women by age who had undergone mammography at least once were 21% (ages 40-49 years), 20% (50-59), 15% (60-69) and 7% (70-79). These proportions increased following the introduction of screening to 52% (40-49), 72% (50-59), 67% (60-69) and 28% (70-79) in 1995. Correspondingly the estimated proportion of invasive cancers detected by screening in the age group 50-69 years rose from 11% in 1989 and 1992 to 39% in 1995. The average annual increase in breast cancer incidence rose more sharply in the target age range following the introduction of screening (annual increase of 7% in women aged 50-69 years compared with 2.9% for women aged 40-49). There was an increase in the incidence of small tumours: the annual rate for those measuring <10 mm rose 5.6 fold in women aged 50-69 years over the period 1986-95 compared with the 2.7 fold increase in women aged 40-49. The incidence of large tumours (>30mm) was relatively stable over the period 1989-92 but fell by 17-20% over the period 1992-95 in women aged 40-69 years. Over the period 1972-89, breast cancer mortality in the age group 50-69 years increased by around 1% per year to 74 per 100,000 women. Thereafter it fell by around 1.5% per year (95% CI -3.8, +1.0) to 66.1 deaths per 100,000 women in 1995. Mortality for all ages fell by an average 2.3% per year over the period 1990-95.

Discussion

The increase in screening activity in NSW has been accompanied by an increase in incidence of small invasive cancers and, subsequently, a decrease in incidence of larger (>30 mm) cancers. The magnitude of these changes is similar to that observed in other programmes. However, whereas the fall in advanced cancer incidence occurred from 1992 onwards, the decrease in mortality started in 1990. The authors hypothesise that the fall in incidence of large cancers in women screened previously may be counterbalanced by increased detection of cancers of this size in women screened for the first time.

Other explanations for the early fall in mortality include better treatment and greater breast awareness in women and health professionals leading to earlier presentation and hence more effective intervention. The authors anticipate further reductions in advanced cancer incidence and in mortality in the future as coverage increases.

References

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