ABSTRACT

Descriptive characteristics of women screened through BreastScreen SA, according to whether they died of breast cancer

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Previous analyses have shown a marked trend towards smaller invasive cancers of the breast in South Australia and an effect of population-based screening on tumour size and nodal status consistent in magnitude with that achieved in the Swedish 'two county' trial.

In this chapter, the characteristics of women screened through BreastScreen SA, but who died of breast cancer, are presented. Specifically, 67 women who died of this disease were compared with 199 screened controls matched to them by year of birth. To be eligible, control women were required to be alive at the times of death of their respective cases.

Women dying of breast cancer tended more: to have lived in a middle-upper socioeconomic area of Adelaide; to have had a family history of breast cancer; to have reported a breast lump or other breast problem at the time of their initial screen; and to have had a history of prior breast problems. Notably, they were less likely than controls to have been exposed to mammography in a private clinic or elsewhere prior to attending BreastScreen SA. It is plausible that this latter finding might reflect, at least in part, risk-reducing benefits of mammography.

Most deaths (approximately four fifths) affected women whose tumours were detected at the initial round of screening. There was a tendency for them to have come from the upper socioeconomic areas of Adelaide. This probably reflects a greater likelihood that women with symptoms or other cancer-related concerns would seek a mammogram if they were to come from these areas, due to their higher levels of general education.

PHOTO 1: BreastScreen SA maintains an active QA process to ensure that women receive high-quality screening.

CHAPTER 9

Descriptive characteristics of women screened through BreastScreen SA, according to whether they died of breast cancer

INTRODUCTION

A pilot population-based mammographic screening programme was introduced in South Australia at the end of 1988.[1] Then, in mid-1991, the Commonwealth Government and the States/Territories established the National Program for the Early Detection of Breast Cancer.[2] This was based on recommendations of the Australian Health Ministers' Advisory Council that two-yearly screening be made available to women aged 40 years and over, and be targeted at 50-69 year olds.[2]

In 1995, a comparison of invasive cancers detected in screened women with contemporaneous cancers arising in other women of similar ages, and matched by tumour histology and laboratory of assessment, pointed to smaller tumours with less nodal involvement among screened women.[3] This was associated with a lower projected case fatality from breast cancer of around 30% 14 years from diagnosis. This difference was broadly consistent with results of experimental trials, and plausible, since similar tumour-size distributions were being achieved in screened women in South Australia as in the Swedish 'two county' trial.[2,4,5]

Further data pointed to a marked reduction in invasive breast-tumour diameters in South Australia.[6] For example, whereas 13% of 1980-86 cases had tumours with diameters of under 15mm, the proportion of 1997 cases with tumours of this size was 33%. A larger increase in frequency of small tumours was evident among 50-69 year olds, the principal screening target, where the proportion of tumours under 15mm increased from 13% in 1980-86 to 40% in 1997.

It was inferred from these data that initiatives in South Australia to detect breast cancers earlier, so as to reduce case fatality, were 'on track'. Mammographic screening is known to reduce, but not eliminate, the risk of breast-cancer death. In this chapter, characteristics of screened women are presented according to whether they subsequently died from breast cancer. The characteristics investigated included screening histories, family histories of breast cancer, histories of other breast problems prior to screening, and places of residence.

Mammography is known to have been used widely in South Australia in private and other clinical settings during the 1980s.[3] Particular emphasis was given in the present study to assessing the association of histories of mammography in these settings with subsequent risk of breast-cancer death.

METHODS

In all, 67 of the women screened through BreastScreen SA by December, 1997, were found to have died from breast cancer. These deaths were detected in part by linking the records of BreastScreen SA with State death records. On other occasions, they were detected during the routine follow-up of screened women.

For comparative analysis, three women were selected at random from the files of BreastScreen SA for each of the women who had died. Comparison women were matched to their respective dead cases by year of birth and were required to have been alive at the time of these deaths. In two instances, a comparison woman could not be found who met the eligibility criteria. The final comparison group therefore comprised 199 subjects.

The residential postcodes of subjects at the times of their initial screens were categorized as Adelaide low-middle SES, Adelaide middle-upper SES, or a country region. The methods used to derive this geographic classification have been described previously.[7]

Comparison were drawn between deaths and controls using conditional logistic regression.[8] Relative risks were inferred from the odds ratios derived from the regression models, together with 95% confidence limits.

RESULTS

The mean age (± SE) of the 67 dead cases was 60.7 (± 1.2) years at the time of diagnosis of their breast cancers, and 63.6 (± 1.2) years at death. They tended more than controls to have had their initial screens in the early years of the programme. For example, 66% of them were screened during 1988-92, as compared with 13% of controls. Most of the 67 cases (79%) had had their cancers detected at their initial screens and therefore had ceased to be eligible for further screening. As a consequence, the mean number of screening rounds that were attended by them was only 0.6, a much lower figure than the corresponding 1.5 for controls.

Compared with controls, the 67 dead cases tended more: to have lived in a middle-upper socioeconomic area of Adelaide, as opposed to another South Australian location; not to have had a history of mammography prior to being screened through BreastScreen SA; to have had a family history of breast cancer; to have reported a breast lump or other breast problem at the time of their initial screen; and to also have had a history of breast problems prior to that time (Table 1). Dead cases with a history of mammography prior to being screened in BreastScreen SA had experienced such an examination more recently than applying to similarly exposed controls ($p<0.001$), with the mean number of years since their last mammographic examination being 2.1 at the time of their first screen in BreastScreen SA, as compared with a corresponding 5.1 years for controls.

While more of the dead cases (73%) than controls (65%) had been born in Australia, the difference was not statistically significant ($p=0.227$).

Conditional multiple logistic regression analysis indicated that the key predictors of breast-cancer death in these screened women were: residence in a middle-upper socioeconomic area of Adelaide; not having a history of mammography prior to attending BreastScreen SA; having a family history of breast cancer; reporting a lump or another breast problem at the time of the initial screen; and reporting a prior breast problem. The relative risks (95% confidence limits) inferred from the odds ratios were as follows:

Predictors	*Relative risk*	
Residence:		
Other (reference)	1.00	
Middle–upper SES area of Adelaide	2.80	(1.33, 5.92)
Mammography prior to BreastScreen SA:		
No (reference)	1.00	
Yes	0.14	(0.05, 0.39)
Family history of breast cancer:		
No (reference)	1.00	
Yes	2.80	(1.17, 6.68)
Lump reported prior to initial screen:		
No (reference)	1.00	
Yes	34.82	(3.79, 319.68)
Other breast problem reported prior to initial screen:		
No (reference)	1.00	
Yes	6.16	(1.79, 21.16)
Past breast problem:		
No (reference)	1.00	
Yes	2.43	(1.09, 5.40)

DISCUSSION

Predictably, the risk of dying from breast cancer was raised among: screenees with a family history of this disease; and those who had experienced a breast lump or another breast problem prior to screening.

There was an association of middle-upper socioeconomic status of residential area with elevated risk of cancer death. This probably reflects a greater likelihood that women with symptoms or other cancer-related concerns would seek a mammogram if they were to come from these areas, due to their higher levels of general education.

Exposure to mammography prior to attending BreastScreen SA was about seven times less likely among dead cases than controls. A number of explanations could be postulated, but it is plausible that a reduction in the risk of breast-cancer death would have occurred as a result of this exposure.

It is notable that about four fifths of the dead cases had their breast cancers detected at their initial screen in BreastScreen SA, before a history of screening could have been established to reduce their mortality risk.

REFERENCES

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*TABLE 1: Descriptive characteristics of women screened through BreastScreen SA, according to whether they died of breast cancer**

Characteristics	*Dead cases (n=67)*	*Controls (n=199)*	*P value***
Country of birth:			
Australia	73.1%	65.3%	p=0.227
Other	26.9%	34.7%	
Residence:			
Adelaide – mid/upper SES	37.3%	23.1%	p=0.024
Other	62.7%	76.9%	
Mammography before screening:			
Yes	14.9%	34.2%	p=0.003
No	85.1%	65.8%	
Family history of breast cancer:			
Yes	29.9%	19.6%	p=0.086
No	70.1%	80.4%	
Very strong family history of breast cancer:			
Yes	14.9%	7.0%	p=0.049
No	85.1%	93.0%	
Lump reported prior to initial screen:			
Yes	17.9%	2.5%	p=0.002
No	82.1%	97.5%	
Other breast problems reported prior to initial screen:			
Yes	20.9%	7.0%	p=0.002
No	79.1%	93.0%	
Prior breast problem:			
Yes	37.3%	19.1%	p=0.003
No	62.7%	80.9%	

* *Control selection (see text). Very strong family history = mother, sister or daughter had breast cancer.*

** *As indicated by conditional logistic regression (see text).*