



Variation in detection of ductal carcinoma in situ during screening mammography: A survey within the International Cancer Screening Network[☆]



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¹ See Appendix.

KEYWORDS

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Cancer registration

Abstract Background: There is concern about detection of ductal carcinoma in situ (DCIS) in screening mammography. DCIS accounts for a substantial proportion of screen-detected lesions but its effect on breast cancer mortality is debated. The International Cancer Screening Network conducted a comparative analysis to determine variation in DCIS detection.

Patients and Methods: Data were collected during 2004–2008 on number of screening examinations, detected breast cancers, DCIS cases and Globocan 2008 breast cancer incidence rates derived from national or regional cancer registers. We calculated screen-detection rates for breast cancers and DCIS.

Results: Data were obtained from 15 screening settings in 12 countries; 7,176,050 screening examinations; 29,605 breast cancers and 5324 DCIS cases. The ratio between highest and lowest breast cancer incidence was 2.88 (95% confidence interval (CI) 2.76–3.00); 2.97 (95% CI 2.51–3.51) for detection of breast cancer; and 3.49 (95% CI 2.70–4.51) for detection of DCIS.

Conclusions: Considerable international variation was found in DCIS detection. This variation could not be fully explained by variation in incidence nor in breast cancer detection rates. It suggests the potential for wide discrepancies in management of DCIS resulting in overtreatment of indolent DCIS or undertreatment of potentially curable disease. Comprehensive cancer registration is needed to monitor DCIS detection. Efforts to understand discrepancies and standardise management may improve care.

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1. Introduction

In the United States (US), the rate of ductal carcinoma in situ (DCIS) has increased fivefold in the last 25 years [1]. This dramatic increase has been attributed to the diffusion of screening mammography. Among cases detected by screening in the US between the years 2002 and 2006 close to 24% were DCIS [2]. A marked increase in DCIS incidence rates has also been found in Europe [3–6]. Common belief is that DCIS advances to invasive cancer in the absence of treatment, but the time trend in incidence of invasive breast cancer is not consistent with this expectation for all cases of DCIS [7–9]. It is likely that some forms of DCIS would remain indolent throughout the lifespan of a patient, whereas other types have a greater propensity to advance into life-threatening invasive disease. The natural history of screen-detected DCIS therefore remains ambiguous. To a large extent this is related to the variety of histological subtypes grouped under the one label DCIS. Observational data indicate tumour size, nuclear grade, presence/absence of comedo-type necrosis and age to be independent prognostic factors for DCIS progression [10]. While detection of DCIS is thought to contribute to screening effectiveness [11], there is considerable debate about the overdiagnosis of DCIS and the negative impact of screening if non-lethal disease is identified and treated.

To determine the variation in DCIS detection in screening mammography, we undertook a survey within the framework of the International Cancer Screening Network (ICSN) [12]. We focused on the age group 50 to 69 years for which screening is recommended in all ICSN countries.

2. Patients and methods

We sought data from the ICSN countries regarding DCIS cases identified within well-defined screening

settings between 1st January 2004 and 31st December 2008. These programmes are described in some detail at (<http://appliedresearch.cancer.gov/icsn/breast/screening.html>). Most of the screening settings were population-based, organised screening programmes like the national programme in the Netherlands, while the US data from the Breast Cancer Surveillance Consortium (BCSC) derived from opportunistic screening in well-defined populations. Italy included five and Switzerland four regional programmes. For simplicity we refer to all the screening settings as programmes. One screening mammography examination in a woman was defined as a screening test. We asked each programme to complete Excel spreadsheets of aggregate data regarding number of screening tests performed, number of screen-detected invasive breast cancers, DCIS cases, and lobular carcinoma in situ (LCIS) cases. Screen-detected cases were defined according to the procedures of the individual programmes. In some programmes, the final diagnostic conclusion was directly linked to each screening examination. In the BCSC, a diagnosis within 12 months of an abnormal or positive screening examination was defined as a screen-detected case. We included data for women aged 50–69 years. Data were reported separately for initial screens, the women's first known screen or the first registered in an organised screening programme and subsequent screens. All detected cases were included independently of whether it was a first or a subsequent lesion in a given women or whether there were bilateral lesions. We attempted to collect data for DCIS grade and size, but these variables were unknown for large parts of the data set, 18% for grade and 37% size, and were consequently not used in the analysis.

In total 115 Excel files were collected from 12 countries. Detection rates for invasive breast cancer and DCIS, respectively, were calculated as the number of

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