Detection of DCIS and reduced invasive interval cancers

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When breast screening began in the UK, such was the uncertainty concerning the benefits and harms of detecting ductal carcinoma in situ (DCIS) that national guidelines specified an upper limit as well as a lower limit for detection by individual screening centres. This was only changed when an association was shown between DCIS detection and small invasive cancer detection in the National Health Service Breast Screening Programme.[1] Nonetheless, controversy regarding the pros and cons of DCIS detection at screening has continued to this day.

In *The Lancet Oncology*, Stephen Duffy and colleagues[2] make a major contribution to the debate concerning the benefits and harms of detecting DCIS at mammographic screening. The association between DCIS detected at screening and a reduction in invasive interval cancers in the subsequent 3 years shown in this study is novel and notable. The short time interval in which this effect is noted suggests that high-grade DCIS (which represents most screen-detected DCIS) has the potential to become invasive and symptomatic in a shorter time period than previously thought. However, this study has not addressed the effect of DCIS detection on invasive cancer detection at the subsequent screening round and beyond. Three previous randomised trials of breast cancer screening have shown that although the total number of cancers detected in the screening and control arms are similar, the frequency of invasive cancer is higher in the control group than in the screening group.[3] Together, these studies suggest possible prevention of invasive disease by DCIS detection and treatment at screening.

The study by Duffy and colleagues does not address the strong association seen between the grade of DCIS and the grade of invasive cancer arising from it, as shown in a previous report.[4] The high sensitivity of mammography for high-grade DCIS with necrosis but low sensitivity for low-grade DCIS without necrosis[5] means that DCIS detection and treatment at screening will differentially prevent the occurrence of high-grade invasive cancers. This should lead to benefits in terms of breast cancer mortality reduction in a short period but not be associated with a high frequency of overdiagnosis. It is not clear if the high frequency of screen-detected HER2-positive high-grade DCIS leads to a reduction in HER2-positive invasive cancers in particular.[6]

The results of this study do not mitigate the harms due to overdiagnosis caused by the detection of low-grade DCIS, which represents about 15% of screen-detected DCIS and 3% of all screen-detected cancer. The LORIS trial continues to be an important study that aims to reduce the harms of detecting and treating low risk DCIS.[7] Other indolent breast cancers detected at screening such as invasive tubular cancer deserve similar attention.

It has been argued that recalling for further assessment following screening only those patients with comedo calcification and not those with granular calcification might prevent overdiagnosis of low-grade DCIS while detecting high-grade DCIS. Unfortunately, when small, high-grade DCIS rarely shows the characteristic comedo calcifications seen in larger areas of high-grade DCIS, while a large area of low-grade DCIS might show comedo calcification.[8] It is therefore impossible for radiologists to recall small cases of high-grade DCIS without also recalling low-grade DCIS. Although this study shows that sites with a high frequency of DCIS detection are associated with a higher proportion of low or intermediate grade DCIS, the effect is very small. The smaller reduction of interval cancers associated with very high rates of DCIS detection is likely to be due to cases with small areas of high-grade DCIS having a longer time to invasion than cases of large areas of high-grade DCIS.

Further studies exploring how frequently DCIS detection at screening prevents biologically important invasive breast cancer are required for a full assessment of the benefits and harms of detecting DCIS at mammographic screening.

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I declare no competing interests.

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