Ethnicity, deprivation and screening: an analysis of survival from breast cancer among screening-eligible women in the West Midlands diagnosed from 1989 to 2011

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Words 485

Background

Previous research has found inequalities in breast cancer survival by ethnicity and deprivation. The impact of screening on these differences in survival has not been studied. Linked datasets and new analytic techniques are used in this study, which aimed to examine ethnic and deprivation-specific survival for women with screen-detected and non-screen-detected breast cancer, in order to establish whether there are disparities in the presence of a well-established screening programme.

Methods

We used cancer registry data from a centre of excellence, the West Midlands Quality Assurance Centre, linked with breast screening records, Hospital Episode Statistics and mortality data up to 2012. We analysed women aged 50-70 who would have been invited for screening continuously from around their 50th birthday onwards and who were diagnosed with breast cancer between 1989 and 2011 (N=20,283). Self-reported ethnicity data was 90% complete. We then imputed ethnicity for the remaining 10% using name recognition software. Ethnicity was categorised into the three main groups: Asian, Black and White. Deprivation was assigned on the basis of the woman's postcode. We applied either the Townsend score for 2001 or the Income Domain of the Index of Multiple Deprivation for 2001, 2004, and 2007. The score most contemporaneous to the woman's date of diagnosis was used. Results are reported for grouped categories of: less deprived (quintiles 1 and 2) and middle/more deprived (quintiles 3-5). We estimated net survival corrected for lead time bias and overdiagnosis. We used ethnic- and deprivation-specific life tables to correct for background mortality.

Results

Although Black women showed consistently lower overall net survival from breast cancer than the other groups, no significant differences in survival were found for the different ethnic groups. Survival by extent of disease was similar for all ethnicities. Adjusting for deprivation, there were no significant differences for Asian or Black women although Black women from the more deprived groups displayed a survival disadvantage. For the White group, where numbers in all deprivation groups permitted robust analysis, clear deprivation differences were found in five-year net survival: 90.0% (95%CIs 89.2%-90.8%) in less deprived groups, but 86.6% (95%CIs 85.9%-87.4%) in the more deprived. Screening benefitted all ethnic and deprivation groups with no evident ethnic differences within screening categories. Whether screen-detected or not, women in lower deprivation categories had significantly poorer survival, with a difference of 16% in five-year survival between less deprived women who were screen-detected (94.0%, 95% CIs 93.1%-95.1%) and more deprived women who were not screen-detected (78.0%, 95% CIs 76.7%-79.2%).

Conclusion

We estimated up-to-date net survival from breast cancer among ethnic and deprivation groups by screening status using newly-developed life tables. The three main ethnic groups differed little in their experience of breast cancer survival. While screening conferred a survival benefit to all, there were still wide disparities in survival by deprivation. Further research should examine the underlying reasons for these differences, in particular whether earlier diagnosis could improve survival among the more deprived groups.