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Receipt of Surveillance Mammograms and Mortality After Breast Cancer Therapy

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Background: We investigated the relationship between receiving mammograms to screen for breast cancer recurrence (surveillance mammograms) and mortality rates in a cohort of women age sixty-five years and older at diagnosis between 1990 and 1994.

Methods: Patients were diagnosed with stage I or II breast cancer at six healthcare delivery systems. We used medical record review to ascertain demographic, tumor, treatment, comorbid disease, and post-treatment surveillance mammogram information beginning six months after diagnosis. We identified date and cause of death from the National Death Index during five-years of follow-up. We used risk-set sampling to nest a case-control analysis. Cases were decedents. We selected four controls for each case among women who had survived at least as long after diagnosis as the case and had been diagnosed at the same site. We used conditional logistic regression to compare the number of surveillance mammograms received by the cases to the number received by matched controls as an estimate of the rate ratio (RR) relating receipt of surveillance mammograms to all-cause mortality.

Results: We enrolled 1859 women, of whom 382 died and 102 disenrolled. We observed the expected relationships between covariates and all cause mortality. For example, older women, women with more baseline comorbid diseases, and women with more advanced stage at diagnosis had higher mortality rates. Receipt of one surveillance mammogram, compared with receipt of none, was associated with a reduced mortality rate (RR=0.62, 95% CI 0.45–0.85). Each additional surveillance mammogram was associated with a further reduction in mortality rate (RR for 2 mammograms=0.28, 95% CI 0.19–0.41; RR for 3 mammograms=0.20, 95% CI 0.13–0.32; and RR for 4 mammograms=0.05, 95% CI 0.02–0.12 vs. no mammograms). When analyzed as an ordinal variable, each additional mammogram was associated with about a two-fold reduction in mortality rate (RR=0.53, 95% CI 0.46–0.60). We identified no important confounders aside from the matched factors.

Conclusions: While these results suggest that surveillance mammograms protect against mortality, the effect may also derive from underlying differences in medical care use or preventive health behaviors.