Higher Stage of Disease Is Associated With Bilateral Mastectomy Among Patients With Breast Cancer: A Population-Based Survey

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Abstract

We examined factors that were associated with bilateral mastectomy and reconstruction in a population-based survey. In addition to other previously described factors, having stage III disease (vs. stage 0) was associated with bilateral mastectomy. Given the lack of clear medical benefit for this procedure, our findings highlight the need for interventions to assure women are making informed surgical decisions.

Background: The reasons for increasing rates of bilateral mastectomy for unilateral breast cancer are incompletely understood, and associations of disease stage with bilateral surgery have been inconsistent. We examined associations of clinical and sociodemographic factors, including stage, with surgery type and reconstruction receipt among women with breast cancer. **Patients and Methods:** We surveyed a diverse population-based sample of women from Northern California cancer registries with stage 0 to III breast cancer diagnosed during 2010-2011 (participation rate, 68.5%). Using multinomial logistic regression, we examined factors associated with bilateral and unilateral mastectomy (vs. breast-conserving surgery), adjusting for tumor and sociodemographic characteristics. In a second model, we examined factors associated with reconstruction for mastectomy-treated patients. **Results:** Among 487 participants, 58% had breast-conserving surgery, 32% had unilateral mastectomy, and 10% underwent bilateral mastectomy. In adjusted analyses, women with stage III (vs. stage 0) cancers had higher odds of bilateral mastectomy (odds ratio [OR], 8.28; 95% confidence interval, 2.32-29.50); women with stage II and III (vs. stage 0) disease had higher odds of unilateral mastectomy. Higher (vs. lower) income was also associated with bilateral mastectomy, while age $\geq$ 60 years (vs. $<$ 50 years) was associated with lower odds of bilateral surgery. Among mastectomy-treated patients (n = 206), bilateral mastectomy, unmarried status, and higher education and income were all associated with reconstruction ($P < .05$). **Conclusion:** In this population-based cohort, women with the greatest risk of distant recurrence were most likely to undergo bilateral mastectomy despite a lack of clear medical benefit, raising concern for overtreatment. Our findings highlight the need for interventions to assure women are making informed surgical decisions.

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Introduction

Rates of mastectomy and contralateral mastectomy for patients with cancer are on the rise[1-11] despite strong evidence of equivalent long-term survival for breast-conserving surgery (BCS) and mastectomy,[12,13] international consensus for BCS as the preferred therapy when possible,[14,15] and initial increasing frequency of BCS following consensus statements.[1,2] Although the reasons for higher rates of unilateral and bilateral mastectomy are incompletely understood, younger patient age, peace of mind, higher socioeconomic status, white race, regional variation, preoperative

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magnetic resonance imaging, family history/genetics, celebrity/media impact, and cosmetic concerns/symmetry have been associated with bilateral mastectomy.[5-11,16-30] Past studies have varied in their sample size, geographic coverage, and information about reconstruction; they are also frequently registry based and lacking individualized information on sociodemographic factors. Past studies have also had inconsistent findings for receipt of bilateral surgery by stage and are limited by use of older data.[9,10,29] Understanding how disease stage may affect surgical decision making may provide important information on how to best frame discussions with patients regarding risks and benefits of local therapy options.

In this study, we surveyed a diverse sample of women with breast cancer diagnosed in 2010-2011 in Northern California about their cancer treatment. We examined patient clinical and sociodemographic factors associated with receipt of unilateral and bilateral mastectomy as well as reconstruction for mastectomy-treated patients.

Methods

Study Population

As previously described,[31] we identified 1118 white, black, or Hispanic women from regions 1/8 (San Francisco/Santa Clara) and region 3 (Sacramento) of the California Cancer Registry (CCR) who were diagnosed with stage 0 to III breast cancer during 2010-2011. The study was approved by the CCR, the California Health and Human Services Agency Committee for the Protection of Human Subjects, and Harvard Medical School's Committee on Human Studies.

Survey Administration and Patient Enrollment

We mailed letters to eligible patients in English and Spanish inviting them to participate in a survey about their breast cancer care. Potential participants were interviewed by phone after providing verbal informed consent. Interviews were administered in English or Spanish by trained study staff using computer-assisted telephone interview software; 70 of 136 Hispanic women were interviewed in Spanish. Participants received $20 upon interview completion.

Survey

Participants were asked general questions about their breast cancer diagnosis and treatment and also reported race/ethnicity, educational attainment,[32] insurance coverage at diagnosis,[32] health literacy,[33] and comorbidity.[32,34] We obtained tumor and treatment information from the CCR, including surgical type and cancer stage. The survey instrument was published previously.[35]

Survey Response Rates

As shown in Figure 1, among 1118 patients, 231 refused participation (30 sent an opt-out card, and 201 refused by phone), 317 could not be reached (227 had no valid contact information and 90 could not be contacted after 6 attempts), and 68 were either dead or too ill to respond. A total of 502 women responded, for an American Association for a Public Opinion Research[36] response rate of 47.8%. The participation rate among those for whom we had contact information was 68.5%. Respondents had similar baseline demographic and tumor characteristics as nonrespondents, except respondents were younger (mean age, 58 vs.

Figure 1 Schema for Study Enrollment. American Association for Public Opinion Research. Response rate[36] = 502/(1118−68) = 47.8%; Participation Rate = 502/(1118−68−317) = 68.5%