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Surgery and hormone therapy trends in octogenarians with invasive breast cancer



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Abstract

BACKGROUND: There has been a trend toward minimizing surgery in elderly women with estrogen receptor-positive (ER+) breast cancer.

METHODS: Using the National Cancer Data Base, we selected 95,357 women ≥ 80 years with invasive, ER+ breast cancer. Chi-square test and logistic regression were used to analyze trends in surgery and hormone therapy.

RESULTS: From 2004 to 2012, 90% of women were treated with surgery first and 10% were treated with primary nonoperative management. Of those undergoing nonoperative management, 72% received endocrine therapy and 27% had no treatment. The rate of primary nonoperative treatment doubled from 7% in 2004 to 14% in 2012. Multivariate logistic regression adjusted for patient, facility, and tumor factors identified more advanced clinical stage, older age, African-American race, and treatment at Academic facilities as independent predictors of receiving primary nonsurgical management.

CONCLUSIONS: There has been an increase over time in primary nonoperative management of ER+ breast cancer in octogenarians.

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In 2013, 43% of all new invasive breast cancers were in women age 65 or older,¹ and with an aging population that is living longer, this is projected to increase. There has been an increasing trend toward minimizing breast

cancer treatment in the elderly population, particularly in patients with hormone receptor-positive cancers. Radiation after breast conserving surgery and axillary staging have shown no survival benefit for elderly women with early stage breast cancer in randomized clinical trials, and have been incorporated into National Comprehensive Cancer Network guidelines as optional for women ≥ 70 years with early stage, hormone-receptor positive tumors.^{2,3} Primary endocrine therapy in the elderly has also been investigated in several randomized trials, and meta-analysis of these trials found no difference in overall survival between patients treated with primary endocrine therapy compared with surgery, although there

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was an increased progression-free survival in the surgery arm.⁴

Nonsurgical management for breast cancer has been studied mainly in Europe, although there have been a few studies in the United States that have examined the primary approach to the elderly patient with a hormone receptor-positive breast cancer.⁵ In fact, an international comparison of European and the US population-based registries found that nonoperative management of breast cancer is significantly more common in many countries in Europe than in the United States.⁶ We used the National Cancer Data Base (NCDB) to examine treatment trends for patients treated with primary nonoperative management (endocrine therapy or observation) in women ≥ 80 -year old with estrogen receptor-positive (ER+) invasive breast cancer. We hypothesize that most elderly women are still undergoing upfront surgery for their breast cancer despite the increased number of hormonal agents available to patients today and the high rate of upfront hormonal therapy in other countries.

Methods

The NCDB is a joint project of the American College of Surgeons Commission on Cancer and the American Cancer Society that captures information on approximately 70% of all newly diagnosed cancers in the United States.⁷ All data collected are compliant with the privacy requirements of the Health Insurance Portability and Accountability Act. Institutional review board approval was not required for this study as the collected information was deidentified, no protected health information was reviewed, and the analysis was retrospective.

The breast cancer NCDB participant user file was used to identify women age 80 or older with ER+ breast cancer from 2004 to 2012 who had completely documented information on treatment with surgery and hormone therapy, who received all or part of their care at the reporting facility, and had 2 or less lifetime cancer diagnoses. Patients with in situ or metastatic disease and who underwent adjuvant or neoadjuvant chemotherapy were excluded, which left 95,357 women for the analysis. Patient demographics and tumor characteristics were grouped into categorical variables for analysis. Patient covariates included age, race, and comorbidities (Charlson and/or Deyo index⁸ of 0 to 1 was considered minimal comorbidity, and index of ≥ 2 was considered severe comorbidity). Women greater than 90 years old are categorized as 90-year old in the NCDB. Facility covariates included facility type and location; tumor covariates included clinical stage (cStage); and treatment covariates included breast surgery, axillary surgery, hormone therapy, and radiation therapy. Neoadjuvant hormone therapy was defined as hormone therapy given before surgical treatment. Sentinel node biopsy was defined as 1 to 4 nodes examined, and axillary lymph node dissection was defined as at least 10

nodes examined. Staging information was in accordance with the American Joint Committee on Cancer 7th edition.⁹ Primary nonoperative treatment was considered to be treatment with endocrine therapy alone, treatment with endocrine therapy before surgery, and no documented treatment modality. The NCDB only captures data for the first course of treatment, which usually encompasses the first year of treatment.

All analysis was performed using SPSS statistical software (SPSS for Windows, version 19; Chicago, IL). All statistical tests were 2-sided, and a *P* value of $\leq .05$ was considered statistically significant. Chi-square tests and both univariate and multivariate logistic regression models were used to examine factors associated with increased likelihood of receiving primary nonsurgical treatment compared with a surgery-first approach. Odds ratio (OR) greater than 1 signified higher odds of receiving primary nonsurgical treatment. Confidence intervals (CI) are reported at a 95% significance level.

Results

We identified 95,357 women age 80 or older with nonmetastatic, invasive ER+ breast cancer from 2004 to 2012. The mean age at diagnosis was 84 ± 3 years. 85,824 (90%) patients were Caucasian, 5,678 (6%) were African American, 2,427 (3%) were Hispanic, and 1,138 (1%) were Asian-Pacific Islander. A total of 73,919 (78%) had minimal comorbidities, and 4,805 (5%) had severe comorbidities. At presentation, 42,272 (44%) women were cStage I; 4,427 (21%) were cStage II; and 4,427 (5%) were cStage III. Another 28,894 (30%) had unknown or undocumented clinical stage at presentation. Ultimately, 88,185 (93%) women were treated with surgery (54,789 [62%] with lumpectomy and 33,396 [38%] with mastectomy), 44,465 (58%) with endocrine therapy, and 30,915 (32%) with radiation therapy. Overall 65,250 women (69%) had axillary nodal sampling (40,037 [61%] with sentinel node biopsy and 13,741 [21%] with axillary lymph node dissection).

A total of 86,103 (90%) of women were treated with surgery as the first line of treatment and 9,254 (10%) were treated nonsurgically as the first line of treatment. The treatment approach and breakdown of treatments received in our cohort is described in Fig. 1. The rate of primary nonsurgical treatment doubled over the time frame of the study from 7% in 2004 to 14% in 2012 ($P < .01$) among the entire cohort of octogenarians. The breakdown of the time trends of each type of primary nonsurgical option is shown in Fig. 2.

When we compared characteristics of patients that had primary nonsurgical treatment to those that had surgery first, we found that patients that had primary nonsurgical treatment were more likely to be 86 to 90 years of age (54% vs 32%), African American (11% vs 6%), have severe comorbidities (7% vs 5%), have clinical stage III disease at

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