Accelerated partial breast irradiation (APBI) is an acceptable alternative to whole breast irradiation in appropriately selected patients with early stage breast cancer. Despite the existence of risk-stratified guidelines, APBI may be underutilized in the treatment of this select group of patients. Recent data used the Surveillance, Epidemiology, and End Results Program (SEER) database to quantify early staged breast cancer patients who may have been eligible for APBI using four different APBI guidelines. Unfortunately, the SEER database does not provide information on important clinical and pathological features that may render a patient ineligible for APBI. Our study aims to improve upon the accuracy of patient selection and eligibility for APBI using the National Cancer Database (NCDB) and to compare these findings to current APBI practices.

Methods

Women treated for early stage (I-II) breast cancer who underwent breast conserving surgery (BCS) were identified in the NCDB from 2009-2014. Tumor characteristics (size, histology, stage, grade, and hormone status) and patient characteristics were analyzed for APBI eligibility using the following four national and international guidelines: the 2009 American Society for Radiation Oncology [ASTRO], the 2013 American Brachytherapy Society [ABS], and the 2012 Intensity Modulated and Partial Organ Radiotherapy following Breast Conservation Surgery for Early Breast Cancer trial [IMPORT LOW]. Patients with bilateral breast cancers, previous malignancy of any kind, mastectomy patients, and patients receiving neoadjuvant chemotherapy were excluded. Using the patient selection criteria designated by each APBI guideline, the number of patients eligible for APBI was determined. The number of APBI eligible patients using the NCDB were then compared to those numbers obtained by the SEER database and to the number of NCDB patients who actually received APBI. Statistics were performed using unpaired t-tests.

Results

A total of 304,150 early stage breast cancer patients treated with BCS were identified from the NCDB. Out of these patients, 275,587 (90.6%) received whole breast radiation and 28,563 (9.4%) received APBI. Using four guidelines, the percentage of patients eligible for APBI in the NCDB and SEER databases, respectively, were: 15.1% vs. 41.2% [ASTRO], 18.8% vs. 74.6% [GEC-ESTRO], 38.8% vs. 74.6% [ABS], and 52.4% vs. 75.0% [IMPORT LOW]; (all p <0.0001). Out of the patients in NCDB who were eligible for APBI, the percentage of patients who actually received APBI were: 15.2% [ASTRO], 15.0% [GEC-ESTRO], 12.3% [ABS], and 12.4% [IMPORT LOW]. Information regarding which institutions have limited or no access to partial breast irradiation modalities could not be elicited from the NCDB, nor does the NCDB give information about patient preference.

Conclusion

Previous reports on patient eligibility for APBI using SEER data are overestimated, largely due to the unavailability of important patient and tumor characteristics not captured within the SEER database. Moreover, our analysis of NCDB data reveals a potential underutilization of APBI in appropriately selected patients. Additional studies are needed to account for the role of randomized clinical trial results, institutional capability to offer APBI, and patient preference.