Are we Choosing Wisely in the Omission of Radiation Therapy in Patients with Ductal Carcinoma In situ: A Review of Compliance Using the National Cancer Database

Olutayo Sogunro[1], Fatemeh Shojaeian[1], Calvin Schuster[2], Ambika Singh[3], Piyush Rath[4], Rebecca Marmor[1]

[1] Department of Surgery, Johns Hopkins University School of Medicine, Baltimore, MD, USA
[2] Johns Hopkins University School of Medicine, Baltimore, MD, USA
[3] Nova Southeastern University, Ft. Lauderdale, FL, USA
[4] Johns Hopkins University, Baltimore, MD, USA

Introduction

The Choosing Wisely (CW) campaign, initiated by the American Board of Internal Medicine, promotes evidence-based care by reducing unnecessary procedures and minimizing redundant clinical practices. In 2016, CW guidelines specific to breast oncology recommended that women over 70 years of age with small (≤2 cm), strongly hormone receptor-positive tumors and clinically negative axillary lymph nodes could safely omit both sentinel lymph node biopsy and whole breast radiation. In this study, we evaluate national trends in adherence to the omission of radiation therapy in patients with ductal carcinoma in situ (DCIS) and identify subgroup characteristics associated with compliance or non-compliance with these guidelines. By understanding these patterns, we aim to highlight opportunities to improve implementation of evidence-based, patient-centered care in this growing population.

Methods

Using the National Cancer Data Base (NCDB), we identified female patients, aged ≥70 years, who were diagnosed with DCIS, pathologically T0, clinically node negative, hormone receptor positive, and had undergone surgical treatment between 2010 and 2021. Subgroup analysis evaluating Choosing Wisely compliance (CWC) in omission of radiation therapy (xRT) for patients 70 years or older was performed.

Descriptive statistics were used to summarize the clinical and demographic characteristics of the patients. Baseline and clinical characteristics were compared using the chi-square test for categorical variables. Logistic regression models were used to identify factors associated with compliance. Odds ratios (OR) and 95% confidence intervals (CI) were reported. Analyses were performed using Stata software, version 18.

Results

Figure 1: Compliance Trend - omission of XRT from 2010 – 2021

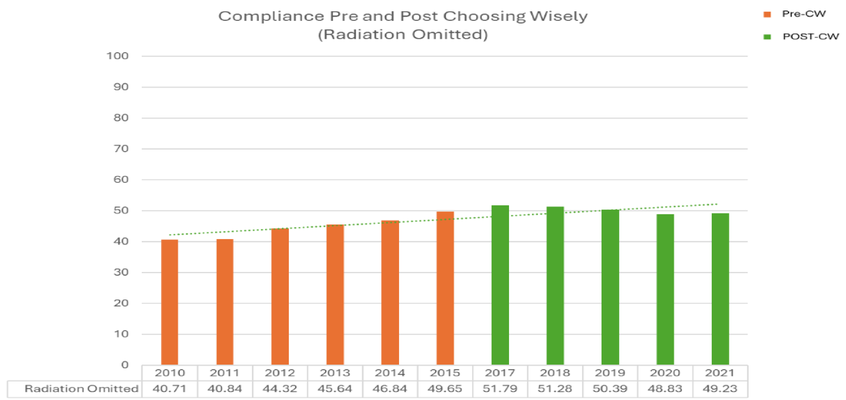


Table 1: Univariate and multivariate analysis of factors contributing to compliance

Variables	Univariable Odds Ratio (95% CI)	p-value	Multivariable Odds Ratio (95% CI)	p-value
Age	1.11 (1.11-1.12)	0.000	1.10 (1.10-1.11)	0.000
Race				
White	Ref		Ref	
African American	0.97 (0.90-1.05)	0.556	0.99 (0.91-1.09)	0.999
Asian	0.94 (0.82-1.06)	0.343	0.93 (0.81-1.07)	0.333
Other	1.46 (1.13-1.89)	0.003	1.39 (1.05-1.82)	0.018
Charlson-Deyo Score				
0	Ref		Ref	
1	1.06 (0.98-1.15)	0.092	1.09 (1.01-1.19)	0.024
2	1.18 (1.04-1.34)	0.009	1.09 (0.96-1.25)	0.171
3	1.41 (1.22-1.64)	0.000	1.31 (1.11-1.53)	0.001
Urban/Rural				
Metropolitan area	Ref		Ref	
Urban	1.00 (0.92-1.09)	0.915	1.08 (0.98-1.19)	0.106
Rural	0.85 (0.65-1.10)	0.232	0.91 (0.68-1.20)	0.520
Facility Type				
Community	Ref		Ref	
Academic	1.13 (1.06-1.20)	0.000	1.20 (1.12-1.28)	0.000
Integrated	1.10 (1.02-1.18)	0.007	1.11 (1.03-1.20)	0.005
Tumor Characteristics				
Histology				
Ductal Carcinoma in Situ, NOS	Ref		Ref	
Papillary subtypes	1.92 (1.70-2.17)	0.000	1.77 (1.55-2.02)	0.000
Comedo carcinoma in situ	0.69 (0.56-0.86)	0.001	0.69 (0.55-0.87)	0.002
Solid carcinoma in situ	0.96 (0.76-1.21)	0.769	0.84 (0.64-1.09)	0.203
Cribriform carcinoma in situ	1.50 (1.29-1.73)	0.000	1.40 (1.19-1.64)	0.000
Mixed subtypes	1.05 (0.94-1.17)	0.358	0.87 (0.76-1.02)	0.090
Treatments				
Regional Lymph Node Surgery (%)				
Not Received	Ref		Ref	
Received	0.67 (0.61-0.73)	0.000	0.69 (0.64-0.76)	0.000
Due to a high number of missing values, grade and HER2 have not been included in the MVA analysis				

Our analysis of the NCDB resulted in a total of 57,132 patients. We divided the patients into **Group 1- pre-CW** (years 2010-2015) and **Group 2- post-CW** (years 2017-2021). Group 1 included 24,658 patients and Group 2 had 32,474 patients. The average age was 75 in both groups, and 84% and 81% of patients were White in Group 1 and 2, respectively. The Charlson-Deyo Score (CDS) was similar between the two groups. Eighty-seven percent of patients in each group were treated in metro areas. Fifty-one percent in both groups were classified as being treated in a community facility. In Group 1, 45% of patients had **omission of radiation therapy** compared to **50.3** % in Group 2; the trend over time is shown in Figure 1. A multivariate logistic regression model analysis was performed to evaluate factors associated with a higher rate of CWC (Table 1). Increased **age** (OR: 1.10, 95% CI 1.10-1.11, p<0.001), CDS of 3 (OR:1.31, 95% CI 1.11-1.53, p = 0.001), and treatment at an **academic facility** (OR:1.20, 95% CI 1.12-1.28, p <0.001), were associated with higher CWC. The **papillary** and **cribriform** histological subtypes were significantly more likely to be compliant, (OR:1.77, 95% CI 1.55-2.02, p <0.001) and (OR:1.40, 95% CI 1.19-1.64 p <0.001), respectively. The **comedo** subtype was 31% less likely to be compliant (OR:0.69, 95% CI 0.55-0.87, p = 0.002) compared to the DCIS non otherwise specified subtype. Race and an urban versus rural setting did not have a significant impact on compliance.

Conclusion

Since the Choosing Wisely recommendations were published in 2016, the implementation of the guidelines into standard of care has been prevalent in medical societies. In our NCDB analysis of patients greater than 70 years of age with DCIS, compliance in the omission of radiation therapy was evident in 50.3% of patients. With only a 5.3% difference between the pre and post-choosing wisely groups, these findings highlight an opportunity to improve guideline implementation, particularly in non-academic settings. Ultimately, adherence to CW recommendations should be guided by shared decision-making between patients and physicians.

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