

OBJECTIVES

To characterize the temporal changes in and clinical factors associated with the utilization of regional nodal irradiation (RNI) during post-lumpectomy radiotherapy (RT) for N0-N1 breast cancer across a contemporary, statewide consortium of radiation oncology practices.

METHODS

Within a statewide radiation oncology quality consortium, 12,170 breast cancer patients undergoing post-lumpectomy RT were consecutively enrolled between 1/1/2013 and 10/31/2019 in both academic (teaching) and community (non-teaching) facilities. Exclusion criteria for this analysis included non-invasive disease (N=2,403), receipt of neo-adjuvant chemotherapy (N=880), missing nodal surgery and/or RT treatment information (N=171), N2/N3 nodal disease (N=226), and/or evidence of distant metastatic disease (N=20).

Data on receptor status, receipt of adjuvant systemic therapy, age, T-stage, extent of axillary surgery, race, body mass index (BMI), type of treating facility (academic vs community), and year completing RT were collected.

Multiple variable logistic regression models were separately fit to explain the use of directed RNI (to the axilla, supraclavicular, and/or internal mammary region) for the N0 and N1 populations and described using odds ratios (OR), with significant ORs (p<0.05) reported.

- A total of 8,468 patients from 29 treating facilities across the state of Michigan met the inclusion criteria: 6,929 (81.8%) with N0 and 1,539 (18.2%) with N1 disease.
- For the N0 cohort, significant correlates of RNI on multivariate analysis (MVA) were receipt of adjuvant chemotherapy (OR 2.7), higher T-stage (OR 1.9 for T2 vs T1 and 27.3 for T3/T4 vs T1), axillary surgery [compared to sentinel node biopsy (SLN) alone: no axillary surgery (OR 14.5), axillary lymph node dissection (ALND) with 10+ nodes removed (OR 15.1), ALND after SLN (OR 2.7)], and underweight BMI (OR 4.9 compared to overweight, which was the reference category, due to being the most frequent BMI category).
- For the N1 cohort, MVA suggested adjuvant chemotherapy (OR 1.8), larger tumors (OR 1.6 for T2 vs T1), and ALND with <10 nodes removed (OR 1.7) were significantly associated with use of RNI (*see figure to right*).
- The year completing RT was also significantly associated with RNI use in both cohorts, with 22% (N0) and 15% (N1) increases from 2013 to 2019.
- Receiving RT in an academic, compared to a community, facility was significantly associated with receipt of RNI in both the N0 (OR 1.8) and N1 (OR 2.2) cohorts.

Location of regional nodes irradiated during the entire study period

Level	Statistics	Total Population	N0	N1
No RNI or Not Reported	N (%)	7467 (88.16)	6836 (98.63)	631 (41.00)
Any Axillary level only	N (%)	165 (1.95)	34 (0.49)	131 (8.51)
SCV only	N (%)	95 (1.12)	7 (0.10)	88 (5.72)
IMN only	N (%)	29 (0.34)	25 (0.36)	4 (0.26)
Any Axillary level + SCV	N (%)	386 (4.56)	18 (0.26)	368 (23.91)
Any Axillary level + IMN	N (%)	8 (0.09)	2 (0.03)	6 (0.39)
SCV + IMN	N (%)	12 (0.14)		12 (0.78)
Any Axillary level + SCV + IMN	N (%)	308 (3.64)	9 (0.13)	299 (19.43)

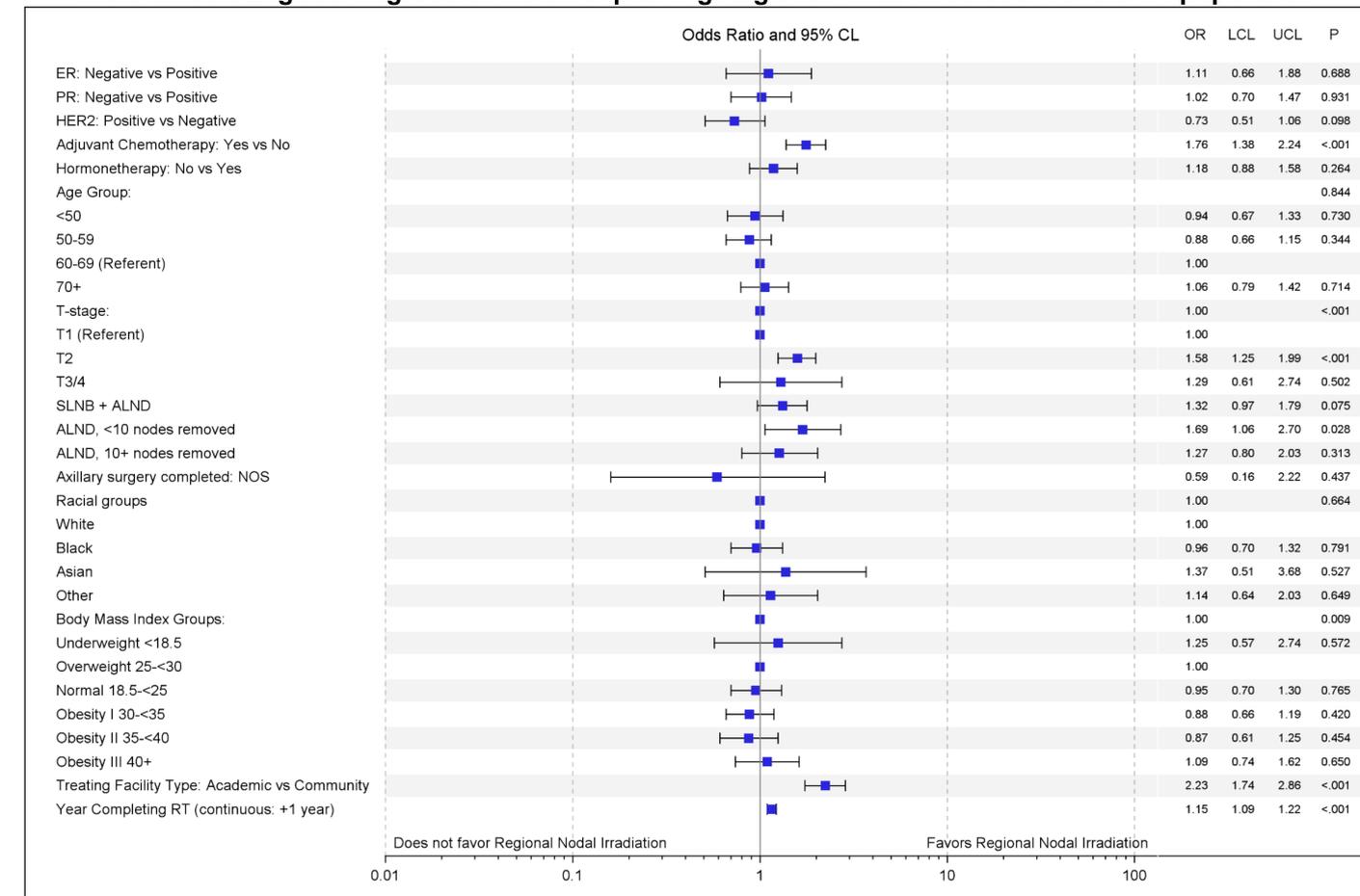
In order to determine the combinations of RNI, Axilla (levels I and/or II) and ICV (level III) were combined to represent any axillary RNI.

CONCLUSIONS

- In this large cohort, selective use of RNI added to post-lumpectomy whole breast RT is estimated to have increased over time, suggesting growing implementation of recent trial data and current clinical guidelines.
- Patient, treatment, and tumor characteristics appear to factor into the decision to treat with RNI, but differences in use between facility type suggest opportunities for improving the consistency of care across care delivery settings.
- Ongoing trials seeking to identify subgroups of N1 patients in whom RNI can safely be omitted may be especially important to inform decisions, given the almost even split (59% receiving, 41% not) in practice observed in this large American cohort.

RESULTS

Multivariable Logistic Regression Model explaining Regional Nodal Irradiation for the N1 population



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For more information on MROQC, please visit www.mroqc.org

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