Purpose/Objective(s): Lumpectomy and hormonal therapy (HT) without radiation therapy (RT) is an accepted approach for elderly women with early stage estrogen receptor-positive (ER+) breast cancer. However, compliance with HT may be poor due to toxicity. Adjuvant RT alone may have better compliance, but its role in the absence of HT is unclear. This study assesses patterns of adjuvant therapy and compares survival outcomes among women receiving HT alone, RT alone, or both.

Materials/Methods: This observational cohort study used the National Cancer Data Base (NCDB) to identify women aged ≥65 years with invasive ER+, T1, node-negative, and unilateral breast cancer diagnosed from 2004 to 2015. All patients underwent lumpectomy with negative margins. Patients treated with chemotherapy or immunotherapy were excluded. Use of HT and RT was assessed over time, and multivariable multinomial logistic regression was used to evaluate independent associations with treatment. Kaplan-Meier survival curves and multivariable Cox proportional hazards models were used to assess the association of treatment with 5 and 10-year overall survival (OS) from surgery, adjusting for patient, facility, and tumor covariates.

Results: The cohort included 130,194 women who met the study criteria. Of these, 12.8% (n=16,689) received no adjuvant treatment, 18.1% (n=23,548) received HT alone, 14.0% (n=18,220) received RT alone, and 55.1% (n=71,737) received HT and RT. The use of HT alone increased over the study period, from 10.6% in 2004 to 23.9% in 2015 (p<0.0001), while the use of RT alone decreased from 25.6% to 8.5% (p<0.0001). Compared to patients who received both HT and RT, older patients and patients treated at an academic facility were more likely to receive single-modality therapy (HT alone or RT alone), while patients with higher grade tumors and lobular histology were less likely to receive single-modality treatment. RT alone was less common and HT alone was more common with greater distance from the reporting facility (>50 vs. ≤50 miles) and later year of diagnosis. Patients with higher Charlson-Deyo co-morbidity score (≥2 vs. 0-1) were more likely to receive HT alone (odds ratio [OR] 1.49; 95% confidence interval [CI] 1.38-1.62). Unadjusted 5/10-year OS rates were 90.0%/64.3% for HT and RT, 84.2%/54.9% for RT alone, 78.7%/44.5% for HT alone, and 71.6%/38.0% for no treatment; p<0.001. Compared to patients receiving HT and RT, the 10-year multivariable hazard ratio (HR) for death for RT alone was 1.28 (95% CI 1.22-1.34) and for HT alone was 1.49 (95% CI 1.42-1.55).

Conclusion: Elderly women with early stage ER+ breast cancer who underwent lumpectomy and received HT and RT had the best survival. Assessment of single-modality therapy showed that RT alone had higher rates of OS at 5 and 10 years compared to HT alone. This finding persisted after adjusting for patient, facility, and tumor covariates. These data support the prospective evaluation of RT alone vs. HT alone in this patient population.


2053

A Clinical Trial of Curative Accelerated Partial-Breast Irradiation for Stage I Breast Cancer using Carbon Ion Radiotherapy

K. Karasawa, T. Omatsu, N. Okonogi, H. Murata, S. Fukuda, and T. Kamada; 1Tokyo Women’s Medical University, Tokyo, Japan, 2National Institutes for Quantum and Radiological Science and Technology, Chiba, Japan

Purpose/Objective(s): Our institute conducted a clinical trial of curative accelerated partial breast irradiation (APBI) using carbon ion radiotherapy (CIRT) to patients with stage I breast cancer. The purpose of this report is to evaluate treatment outcomes up to now.

Materials/Methods: The candidates of phase I/II study of CIRT are patients with low-risk stage I (estrogen receptor positive, HER2 negative, age 60 years old and above) breast cancer. The patients who had minor variance from eligible criteria of the clinical trial and/or refused to enroll in the clinical trial were treated with “advanced medical care” (AMC) protocol. Tumors located less than 5 mm from the skin are ineligible. A dose escalation study was designed for the phase I clinical trial with the dosage levels: 48.0 Gy (RBE), 52.8 Gy (RBE), and 60.0 Gy (RBE) in 4 fractions within one week, respectively. In phase I, patients plan to undergo tumor excision for pathological evaluation 90 days after CIRT and then receive endocrine therapy. In phase II and AMC protocol, patients treated with CIRT at recommended dosage and then receive endocrine therapy. The CIRT was performed with carbon ion beam with energy of 290 MeV using respiratory gating. The primary end points are early normal tissue reaction and tumor control at recommended dosage.

Results: From April 2013 to February 2019, 30 cases were treated. Seven patients in phase I, 9 patients in phase II trial, and 14 patients in AMC protocol were enrolled. The age ranged from 44 to 83 with a median of 64 years old. The tumor sizes were 4 to 20 with a median of 14 mm. All seven patients in phase I underwent tumor excision 90 days after CIRT. The dose level of 60 Gy (RBE) was selected as a recommended dose. Three patients with the dosage level of 48 Gy(RBE), 6 patients with the dosage level of 52.8 Gy(RBE), and 21 patients with the dosage level of 60 Gy(RBE) were treated. The median follow up period was 46 months. No adverse toxicities have been observed except for grade 1 acute skin reaction in 19 cases. Twenty-eight patients with luminal subtype received endocrine therapy after CIRT. Magnetic resonance imaging (MRI) and ultrasound diagnostic imaging were performed after 1 month, 3 months, and 6 months in all cases. Twenty-two in 23 observed tumors have been keeping complete response with excellent cosmetic outcome. One patient with triple negative, high ki-67 status did not reach complete response, and developed local recurrence and axillary lymph node metastasis.

Conclusion: With careful patient selection, curative APBI for low-risk stage I breast cancer using CIRT is considered to be effective and safe, and further research is recommended.


2054

Predictors of Survival and Patterns of Recurrence in Breast Cancer Treated with Neoadjuvant Chemotherapy, Surgery, and Radiation

D. Keilty, S. Nezafat Namini, M. Swain, M. Maganti, T. Cil, D.R. McCready, D. Cescon, E. Amir, R. Fleming, A.M. Mulligan, W. Levin, F.F. Liu, J.M. Croke, A. Fyles, C.A. Koch, and K. Han; 1Radiation Medicine Program, Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada, 2Department of Biostatistics, Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada, 3Department of Surgical Oncology, Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada, 4Department of Medical Oncology and Hematology, Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada, 5Joint Department of Medical Imaging, Women’s College Hospital, University of Toronto, Toronto, ON, Canada, 6Laboratory Medicine Program, Toronto General Hospital, University Health Network, Toronto, ON, Canada, 7Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada

Purpose/Objective(s): Neoadjuvant chemotherapy (NAC) is standard of care for locally-advanced breast cancer and is increasingly used for early-stage high-risk disease. Previous studies have shown wide variation in radiation (RT) practice and limited data on locoregional relapse (LRR) following NAC. We hypothesized a low LRR risk after treatment with modern NAC, surgery, and RT, and aimed to elucidate patterns of LRR and