**Patterns of Care and Survival Outcomes Examining Radiation Therapy for Advanced Hodgkin Lymphoma**

*C. Son and M. Koshy*

**Purpose/Objective(s):** The use of radiation therapy (RT) in advanced Hodgkin lymphoma (HL) is controversial, and currently optional, according to the National Comprehensive Cancer Network guidelines. The purpose of this analysis was to determine patterns of care in the United States and whether RT was associated with improved survival.

**Materials/Methods:** Data from 1988-2011 was obtained from the Surveillance, Epidemiology, and End Results (SEER) cancer registry and used to determine patient characteristics and survival in adults (age ≥18 years) with stage III-IV HL who survived a minimum of 6 months. The survival minimum was used to minimize bias related to the delivery of RT after chemotherapy. The Kaplan-Meier method was used to determine overall survival (OS). Univariate and multivariate models (UVA, MVA) were analyzed using the log-rank test and Cox proportional hazards model, respectively. A sensitivity analysis was performed for patients diagnosed after 2000 to examine patients treated in a modern treatment era. Due to potential unmeasured confounders in the cohort who did not receive RT, a separate propensity-matched cohort of patients who did and did not undergo RT was created.

**Results:** A total of 9,467 adults (60% male) with advanced HL were included in the analysis. Median age was 39 years, 55% had stage III disease, and 19% of patients received RT. Median follow-up was 66 months for the entire cohort and 81 months for those alive at last follow-up. Stage III patients were more likely to get RT than stage IV patients, 22% versus 16% (P < .0001). Five-year OS for stage III patients for the no RT versus RT cohorts were 79% versus 88% (P < .0001). Five-year OS for stage IV patients for the no RT versus RT cohorts were 73% versus 84% (P < .0001). On MVA the following were associated with OS (all P < .005): RT (hazard ratio, HR = 0.85), older age as a continuous variable (HR = 1.04), Black race (HR = 1.32), female sex (HR = 0.75), stage IV (HR = 1.25), histology (HR = 1.0-1.4), and later year of diagnosis (HR = 0.97). A sensitivity analysis of patients diagnosed after 2000 revealed RT was associated with a HR = of 0.79 (P = .009) on MVA. Multivariate analysis by stage revealed that RT was not associated with survival in stage III patients, HR = 0.94 (P = .4), but was significant for stage IV patients, HR = 0.78 (P = .004). The propensity-matched cohort of patients resulted in 3 390 patients, of whom half received RT, and who were otherwise balanced among the risk factors analyzed. In this group, the hazard ratio for RT on univariate Cox regression was 0.75, (P < .0001).

**Conclusion:** The results of this large study demonstrate a significant decline in utilization of RT from 1988 to 2011; additionally, the use of RT in advanced stage HL was associated with a survival benefit that was significant after multiple sensitivity analyses, particularly in patients with stage IV disease.