

Impact of Radiotherapy on Laryngeal Cancer Survival: A Population-based Study of 13,808 U.S. Patients

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Purpose/Objective(s): Radiation has been used in the management of laryngeal cancer for several decades, offering the advantage of organ preservation. However, the impact of radiation therapy on patient outcome in a large population-based study has not been reported. We evaluate the evolving role of radiation treatment over nearly 2 decades, and its impact on patient outcome, as well as the influence of patient socioeconomic status (SES), on laryngeal cancer treatment among patients reported to the Surveillance, Epidemiology, and End Results (SEER) program.

Materials/Methods: The SEER database on laryngeal cancer treatment from 1988 to 2006 was analyzed. Trends of radiation and total laryngectomy as well as patient outcome were compared over three time periods, 1988-1993, 1994-1999, and 2000-2006, for localized and/or regional glottic and supraglottic cancer. Univariate and multivariate analyses were conducted to evaluate the influence of patients' demographic characteristics and SES on laryngeal cancer treatment received.

Results: A total of 13,808 patients were identified from the SEER database. Radiation therapy as initial treatment over total laryngectomy has increased over the three time periods for localized (94.4%, 97.3%, and 98.0%, $p < 0.001$) and regional (52.7%, 66.2%, 74.5%, $p < 0.001$) glottic cancer, and localized (61.2%, 83.2%, 94.2%, $p < 0.001$), and regional (43.0%, 55.4%, 77.7%, $p < 0.001$) supraglottic cancer. Multivariate logistic regression analysis showed that black patients were less likely to receive radiation than white patients (OR = 0.42, $p < 0.001$ for localized glottic cancer; OR = 0.76, $p = 0.034$ for regional glottic cancer; OR = 0.68, $p = 0.001$ for regional supraglottic cancer). Likewise, patients residing in the counties with lowest tertile median household income were less likely to undergo radiation than the highest one (OR = 0.42, $p < 0.001$ for localized glottic cancer; OR = 0.57, $p < 0.001$ for regional glottic cancer; OR = 0.57, $p < 0.001$ for regional supraglottic cancer). There was no significant decrease in the estimated 5-year overall survival over three time periods for glottic and supraglottic cancer patients treated with radiation.

Conclusions: Increasing radiation usage had no adverse impact on survival. Racial and income status appeared to influence the rate of radiation therapy vs. total laryngectomy.