A population-based analysis of treatment modality and survival in head and neck cancer over the last 30 years.

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ABSTRACT

INTRODUCTION

During the past 30 years, the incidence, demographics and survival of patients with head and neck squamous cell carcinoma (HNSCC) have all undergone well-documented changes. Changes in tobacco use and the increasing prevalence of human papillomavirus (HPV) related oropharyngeal squamous cell carcinoma have led to a lower median presenting age of HNSCC patients. The current practice guidelines, HPV (+) patients undergo intensive chemoradiation (CRT) protocols. Just as their HPV (-) counterparts, but with drastically improved survival. Since the early 1990s and the advent of intensity-modulated radiation therapy (IMRT), a decrease in radiation toxicity has allowed a decrease in the use of concomitant chemoradiation. The change allowed better control of the beam penetration depth, and higher concentrated doses to the targeted site, sparing the surrounding normal structures. The advent of IMRT has led to the second major improvement in radiation therapy, IMRT (IMRT). Unlike CRT, IMRT uses inverse planning to deliver the required dose to the tumor and dose constraints to normal surrounding structures and organs-at-risk. Studies have demonstrated improved functional outcomes with IMRT compared to standard CRT in a theoretical and clinical setting. On average, patients treated with IMRT have a longer period of freedom from local recurrence. The purpose of the current study is to examine different treatment modalities and the impact on survival of HNSCC patients over the past three decades using the Surveillance, Epidemiology and End Results (SEER) database.

METHODS

Data was obtained from the Surveillance, Epidemiology, and End Results (SEER) program (www.seer.cancer.gov) and a data analysis software was used to perform descriptive analyses. Eligible patients were identified using the Cancer Incidence in Five States (CI5S) software. The incidence rates for each variable were calculated. The Kaplan-Meier method was used to estimate unadjusted 5-year survival rates for each treatment arm based on sub-site. Cox-model, factor-adjusted 5-year survival rates and standard errors were then determined to determine survival for each treatment modality which were adjusted for age, sex, histologic grade, and tumor stage. Finally, the cumulative incidence (CI) by Bowman of adjusted 5-year survival rate between the 1980-1984 and 2000-2008 cohorts were calculated.

RESULTS

Due to evidence extrapolated from the VA larynx and RTG9 11-11 trial for non-surgical larynx preservation, there has been an increase in shift from surgery to non-surgical therapy for all HNSCC (Fig1). For both oral cavity and oropharyngeal carcinoma, the use of radiation alone increased from 22.9% to 32.5% from 1980-2008. An inverse trend was seen with surgical therapy decreasing from 38.7% in the 1980-1984 cohort to 27.8% in the 2000-2008 group. The use of both modalities increased slightly (22.1% to 29.9%) over the study time period. Historically, organ preservation protocols for the oropharynx demonstrated that patients treated with primary radiation had similar survival rates to upfront surgical therapy with less complications. For the oropharynx, the complications from traditional surgical therapy were largely due to the external approaches. For oral cavity tumors, primary surgical therapy has remained the recommended upfront treatment modality (Fig3) due to the significant side effects (xerostomia, mucositis and swallowing difficulties) associated with primary radiation therapy to the oral cavity subsites, likely accounting for the majority of the 27.8% of patients treated by surgery alone in 2000-2008 (Fig1).

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REFERENCES