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Patient Characteristics and Costs in Recurrent or Refractory Head and Neck Cancer: Retrospective Analysis of a Community Oncology Database

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ABSTRACT

Purpose: The goal of this study was to describe patient characteristics, health resource utilization (HRU), and costs associated with treating recurrent or refractory head and neck cancer (HNC) among patients with disease progression in the community oncology setting.

Methods: This retrospective observational study was conducted by using data from the Vector Oncology Data Warehouse. Patients had been diagnosed with locally advanced or metastatic (stage III–IVc) HNC between January 1, 2007, and October 1, 2015. Patients also had evidence of at least 1 systemic anticancer therapy regimen following the diagnosis of advanced HNC, with at least 1 disease progression. Costs, treatment patterns, and HRU were evaluated beginning with diagnosis of advanced HNC through 3 lines of therapy. Costs of surgery or radiation were not available for inclusion in the analysis. Total cost for the study period and cost per month were analyzed by using a generalized linear regression model.

Findings: The study included 462 patients (median age, 61 years; range, 26–99 years); of these, 81% were male, 77% were white, and 21% were black. At initial diagnosis, the most frequent tumor locations were the hypopharynx/larynx (31%) and the oropharynx (31%). Human papilloma virus testing was most frequent among the oropharynx group (22% tested, 52% positive). Overall, 42% were current tobacco users and 22% were current or past alcohol abusers/excessive users. Platinum-based combination therapies were the most frequently administered chemotherapy in both first (42%) and second (40%) lines of treatment. Through the overall study period (mean, 20.5 months), 74% of patients were hospitalized, 19% had an emergency department visit, and 100% had an office visit. The overall mean (SD) duration of hospital stay was 12.6 days, and the median number of office visits per patient was 35. The mean monthly health care cost for the overall study period was $14,391 (95% CI, 12,739–16,044). Hospitalization costs represented ~57% of the total expenditures. Statistically significant predictors of higher overall cost included primary tumor location in the oral cavity, history of alcohol abuse/excess use, use of cetuximab, and higher comorbidity index. Older age and being stage IV versus other stages of disease at diagnosis were associated with lower overall cost.

Implications: These data suggest that costs of care in patients with recurrent or refractory HNC are related to patient characteristics and treatment patterns. Identification of factors contributing to the costs of care in HNC may provide a useful foundation for developing strategies to control rising costs. (*Clin Ther*. 2018;∎:∎∎∎–∎∎∎) © 2018 The Authors. Published by Elsevier HS Journals, Inc.

Key words: chemotherapy, cost, head and neck cancer, health resource utilization.

INTRODUCTION

Head and neck cancers (HNC) are a diverse group of cancers that include primarily squamous cell carcinomas (SCC) affecting the oral cavity, pharynx, and larynx.[1] These types of cancer account for ~4% of all

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new cancers (63,030 cases) and 2% of cancer deaths (13,360 deaths) annually in the United States.[2] Although the overall incidence of HNC seems to be declining or stabilizing,[3] incidence rates for certain HNC subtypes are rising in specific patient groups.[4] In particular, from 1973 to 2001, the age-adjusted incidence of oral tongue, base of tongue, and tonsil SCC increased on an annual basis by 2.1%, 1.7%, and 3.9%, respectively, in individuals aged 20 to 44 years ($P < 0.001$ for oral tongue and tonsil SCC; $P = 0.04$ for base of tongue SCC).[5] The economic burden of HNC in the United States was estimated at medical costs of $3.64 billion in 2010, projected to rise to $4.34 billion in 2020.[6]

The most common causes of HNC are tobacco and alcohol use, which work synergistically and are responsible for 70% to 75% of cases.[7] Infection with human papilloma virus (HPV) has also been identified as a cause in a subset of HNC, particularly affecting the oropharynx in younger patients.[4] In 1 study, prevalence of HPV-associated oropharynx SCC significantly increased between 1984 and 2004, and patients were more likely to be young white male subjects but were at lower risk of death.[8] The authors suggest that the rising incidence of this subtype with a more favorable prognosis is responsible for the population-level improvements in overall HNC survival noted in recent years because median survival in HPV-negative cancers has remained unchanged. Projections of HPV-associated oropharynx SCC incidence suggest it will form the majority of HNC diagnosed by 2030.

The 5-year survival rate for patients with early-stage HNC is favorable (83%), but only about one third of patients present at this stage.[2] More than one half of all patients diagnosed with HNC will experience local, regional, or metastatic recurrences.[9] Prognosis is typically poor for patients with recurrent disease, with median overall survival ranging between 5 and 10 months.[10]

Management of patients with HNC can be complex and resource intensive.[11] A variety of medical specialties and support services may be involved, and treatment decisions involve complexities related to specific disease site, staging, and pathologic findings. Early-stage (stage I or II) HNC may be treated using a single modality (surgery or radiotherapy), whereas locally advanced disease (stages III, IVa, and IVb) frequently benefits from multimodal therapy. Concurrent chemoradiotherapy is a standard approach for treatment of locally advanced disease, with high-dose cisplatin added to radiotherapy for patients who can tolerate such treatment. Recommended agents used in concurrent chemoradiotherapy/epidermal growth factor–targeted therapy include cisplatin, cetuximab, carboplatin, or cisplatin plus 5-fluorouracil (5-FU), 5-FU plus hydroxyurea, cisplatin, or carboplatin plus paclitaxel. Carboplatin and cetuximab (except for patients with nasopharyngeal carcinoma, who may receive cisplatin instead) may be given concurrently with radiotherapy after induction chemotherapy.

For patients with recurrence, unresectable, or metastatic disease, the following options are recommended: cisplatin or carboplatin plus 5-FU or docetaxel or paclitaxel plus cetuximab; cisplatin or carboplatin plus docetaxel or paclitaxel; cisplatin or carboplatin plus cetuximab; cisplatin plus 5-FU or gemcitabine; and gemcitabine plus vinorelbine. These agents may also be used as monotherapy. Additional single-agent therapies include methotrexate, capecitabine, afatinib, pembrolizumab, and nivolumab. In addition, with a growing focus on regimens that block immune checkpoints, agents that act to block programmed cell death-1 have received recent approval for the treatment of HNC.[12–15] These include pembrolizumab and nivolumab, both indicated for the treatment of patients with recurrent or metastatic head and neck SCC with disease progression on or after platinum-containing chemotherapy.[14,15]

The purpose of the present study was to use electronic medical records (EMRs) and billing systems data to describe patient characteristics, health resource utilization (HRU), and costs associated with treating recurrent or refractory HNC in the community oncology setting. This study included patients with at least 1 disease progression, which portends a worse prognosis than for patients with typical advanced HNC. Recent data describing economic burden in recurrent or refractory HNC are limited, and most real-world studies of economic burden use administrative claims-based data rather than EMRs.[16,17]

PATIENTS AND METHODS

Study Design, Patients, and Setting

This retrospective, observational study was conducted by using data from the Vector Oncology Data Warehouse, a comprehensive database of EMR data,