ABSTRACT

Objective: Diabetes has been proposed to be a risk factor for postoperative complications in head and neck surgery, particularly when free flap reconstruction is performed. The objective of this study was to determine the relationship between diabetes and mortality, complications, length of stay, and healthcare costs after head and neck surgery.

Methods: A cross-sectional analysis of 92,312 patients who underwent ablative procedures for malignant oral cavity, laryngeal, hypopharyngeal, or oropharyngeal neoplasm in 2003-2008 was performed using discharge data from the Nationwide Inpatient Sample. Patients with diabetes were more likely to have advanced comorbidity, more likely to be black or Hispanic, and more likely to require medical care at another facility or home health care after discharge. The risk of an acute cardiac event was significantly greater for patients with uncomplicated diabetes (RR=1.4, P<0.001) and diabetes with complications (RR=2.2, P<0.001), while patients with diabetes and complications also had a significantly increased risk of acute renal failure (RR=4.4, P=0.001), pneumonia (RR=2.0, P=0.006), and urinary tract infection (RR=3.0, P=0.002). After controlling for all other variables, there was no significant association between uncomplicated or complicated diabetes with in-hospital mortality or postoperative surgical complications; however, diabetes with complications was associated with significantly increased length of hospitalization and hospital-related costs.

Conclusions: Diabetes is associated with an increased risk of acute cardiac events in the postoperative period, with complicated diabetes associated with increased acute medical complications, length of hospitalization, and hospital-related costs in patients undergoing head and neck cancer surgery. These data emphasize the need for careful preoperative identification of high-risk patients.

INTRODUCTION

Chronic conditions such as diabetes mellitus (DM), cardiovascular disease, and chronic obstructive pulmonary disease may affect head and neck cancer patients with greater frequency than age and gender-matched controls without cancer. DM in particular has been associated with poorer outcomes in surgical patients. In this current study we sought to determine the influence of DM and overall comorbidity burden on the perioperative course of surgically treated head and neck cancer patients, focusing on mortality, complications, length of stay, and healthcare costs.

METHODS AND MATERIALS

A cross-sectional analysis of adult patients with a diagnosis of oral cavity, laryngeal, hypopharyngeal, or oropharyngeal cancer from 2003 through 2008 was performed using discharge data from the Nationwide Inpatient Sample. The International Classification of Diseases, 9th revision (ICD-9) codes included primary sites oral cavity (140.0, 140.1, 140.3, 140.4, 140.6, 140.8, 140.9, 141.1, 141.2, 141.3, 141.4, 141.9, 143.0, 143.1, 143.8, 143.9, 144.0, 144.4, 144.8, 144.9, 145.0, 145.1, 145.2, 145.5, 145.6, 145.8, 145.9, 170.1), larynx (161.0, 161.0, 161.1, 161.2, 161.3, 161.8, 161.9, 144.6, 144.5), hypopharynx (148.0, 148.1, 148.2, 148.3, 148.8, 148.9), and oropharynx (141.0, 141.5, 141.6, 141.8, 145.3, 145.4, 146.0, 146.1, 146.2, 146.3, 146.6, 146.7, 146.8, 146.9, 149.0, 149.1). Patients with complicated and uncomplicated DM were identified using Agency for Healthcare Research and Quality (AHRQ) comorbidity measures. Comorbidity was graded using the Charlson comorbidity index. Statistical analysis of demographic variables associated was performed using cross-tabulations, multinomial logistic regression, multivariate logistic regression, and multivariate linear regression modeling.

RESULTS

There were 92,312 eligible cases in 2003-2008. The majority of patients did not have DM: 12% of cases had uncomplicated DM, and only 1% of patients had diabetes with complications. The majority of patients were male, white, and under 65 years of age. Patients with both uncomplicated and complicated DM were more likely to be ≥65 years of age, have Medicare payor status, and have advanced comorbidity scores, while patients with complicated DM were more likely to be black and require transfer to another facility or home health care at discharge (P<0.001).

After controlling for all other variables, both uncomplicated DM and complicated DM was significantly associated with black or Hispanic race, advanced comorbidity, and medical care at another facility or home health care after discharge, while complicated DM was associated with Medicare coverage. (Table 1)

DISCUSSION

These data demonstrate the adverse influence of DM on important short-term outcomes in surgically treated head and neck cancer patients. Compared to patients without DM, DM is associated with a greater risk of postoperative complications after surgery, longer hospital stays and greater hospital costs. Upon discharge they were more likely to require additional medical care either at home or in another facility. In this study DM affected 13% of head and neck cancer patients. These patients likely had chronic complications of DM including cardiovascular disease and renal insufficiency, potentiating the risk of acute medical complications after surgery.

METHODS AND MATERIALS

The observation that DM was not significantly associated with an increased incidence of surgical complications may be explained by marked heterogeneity in glucose control amongst patients with DM. Perioperative glucose control may have a larger influence on surgical complications (e.g. surgical site infection) than a strict diagnosis of DM. The incidence of DM in adults 65 years of age or older is 27%, and hospitalizations related to diabetic complications cost approximately $3.8 billion in 2001. Much of this cost may be preventable with early diagnosis and management of the comorbid diseases that plague poorly-controlled diabetic patients. In the field of head and neck oncology, diabetic complications may delay completion of therapy and severely strain the cost of providing patient care.

CONCLUSIONS

Our analysis found diabetic head and neck cancer patients to be at greater risk for delayed postoperative recovery due to an increase in medical complications, with greater healthcare costs and frequent requirement for extended care upon discharge. Optimal management of DM and concurrent comorbidities in the primary care setting is essential to improve outcomes and reduce costs in patients undergoing surgical treatment of head and cancer.

REFERENCES

6. Economic and Health Costs of Diabetes AHRQ Pub. No. 05-0034 n JANUARY 2005