INTRODUCTION

Imaging plays an integral role in pre-treatment staging and stage-appropriate treatment regimens for head and neck squamous cell carcinoma (HNSCC). New imaging modalities, namely positron emission tomography (PET) and PET-computed tomography (PET-CT), have improved the ability to detect subclinical regional and/or metastatic disease and, due to the increased sensitivity for subclinical disease, have the power to alter pre-treatment TNM staging and overall stage classification. Theoretically, such ‘stage migration’ could place patients harboring subclinical disease into more advanced staging groups and, thus, more intense treatment protocols. On the other hand, patients with suspicious regional findings that are negative on advanced imaging modalities might be placed into less advanced pre-treatment stages. In both scenarios, more appropriate pre-treatment staging would lead to optimal treatment strategies and potentially result in improved stage-specific survival.1,2

CT was found to alter pre-treatment staging in 17% of patients with laryngeal cancer compared to clinical exam alone, but stage-specific 2-year survival was not significantly improved.3 PET was found to alter TNM staging in 20% of patients with HNSCC with stage re-classification in 8%, but stage-specific 5-year survival was not significantly improved.4 The effects of PETCT on stage migration and stage-specific survival have not been evaluated.

METHODS

After institutional approval, subjects were retrospectively identified by International Statistical Classification of Diseases-9 codes. Inclusion criteria were: (1) pathologic diagnosis of HNSCC of the oral cavity, oropharynx, hypopharynx, larynx, or unknown primary; (2) staging CT and PET-CT; and (3) at least 3-year follow-up from initiation of treatment. AJCC criteria (7th edition) were used for TNM and overall staging based on CT and PET-CT. Three-year survival data were acquired using the Social Security Death Index. Stage-specific survival based on CT or PET-CT staging were compared using Fisher’s exact test. Statistical significance was set at p<0.05.

RESULTS

Ninety-seven patients were identified. Head and neck subsites are listed in Table 1. Compared to staging with CT alone, PET-CT resulted in TNM changes in 27/97 (27.8%) patients, where 19 patients were upstaged and 8 patients were downstaged. Distribution of patients according to TNM staging by CT or PETCT is shown in Table 2. PET-CT resulted in overall stage re-classification in 14/97 (14.4%) patients, where 13 patients were upstaged and 1 patient was downstaged. The greatest change was found in patients migrating to stage IV disease. Distribution of overall stage re-classification and reasons for change are found in Table 3. Three-year survival based on CT alone or PETCT are shown in Table 4. As shown, stages I, II, and IV showed improved survival, but these differences were not statistically significant. Stage III showed a small reduction in survival that was not statistically significant.

CONCLUSIONS

In patients with HNSCC, PET-CT imaging altered TNM staging in 27.8% of patients and overall staging in 14.4% compared to CT alone. Changes in stage-specific survival were not statistically significant. We plan to include additional patients to determine whether the observed early increases in stage-specific survival are statistically significant with a larger sample.

REFERENCES