Monocarboxylate Transporter 4 and Caveolin-1 Expression in Squamous Cell Carcinoma of the Oral Cavity

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ABSTRACT

Objective: To determine the significance of caveolin-1 (Cav-1) and monocarboxylate transporter 4 (MCT4) in squamous cell carcinoma of the oral cavity. We hypothesized that high stromal MCT4 would predict a worse prognosis and correlate with low stromal Cav-1.

Setting: Academic tertiary care medical center.

Patients: 42 patients with squamous cell carcinoma of the oral cavity that underwent surgical resection without pre-operative chemotherapy or radiotherapy were identified. 21 patients had stage IV disease, 11 patients had stage III, six patients had stage II and four patients had stage I. The average duration of follow-up was 2.5 years.

Main Outcome Measures: Disease free survival.

Results: 62% (26/42) of patients had high stromal MCT4 staining (score = 2 or 3). High MCT4 stromal expression correlated with high Cav-1 epithelial expression (p = 0.0035). 38% (16/42) of patients had low stromal Cav-1 staining (score = 0). Low stromal Cav-1 staining (score = 0) was associated with a recurrence rate of 30% (7/23), while patients with Cav-1 staining of >50% had no recurrences (p = 0.0035).

Conclusion: In patients with high MCT4 expression, disease free survival was significantly reduced. High stromal expression of MCT4 correlated with two or more positive lymph nodes in patients.

METHODS

A retrospective chart review of patients with oral cavity squamous cell carcinoma at an academic tertiary care medical center was completed. A total of 42 patients met inclusion criteria. Each patient underwent initial surgical resection between 2002 and 2010. Patients had a minimum follow-up of two years and no patients had pre-operative chemotherapy or radiotherapy. Patient age, smoking and drinking status, tumor site, TNM stage, treatment (surgery only, chemotherapy, radiation therapy, pre-operative PET results, use of adjuvant chemo or radiation treatment, length of follow-up, and recurrence status were obtained.

Epidelial and stromal staining patterns were studied and quantified separately from each other. All the tumor on a slide and its dominant staining pattern were considered when determining the percent of immunopositive tumor cells in a sample. The same pathologist scored all samples. A Cav-1 epithelial staining score of 2, 1, or 0 was given if >50, 10-50, or <10% of the advancing tumor edge had positive staining for Cav-1, respectively. A Cav-1 stromal staining score of 2, 1, or 0 was given if >50, 10-50, or <10% of stromal cells stained positively for Cav-1, respectively. An MCT4 epithelial staining score of 3, 2, or 1 was given if >75, 25-75, or <25% of the epithelial tumor cells stained positively for MCT4, respectively. An MCT4 stromal staining score of 3, 2, or 1 was given if >30, 10-30, or <10% of the stromal cells stained positively for MCT4, respectively (figure 1).