

Nuclear localization of signal transducer and activator of transcription 3 in head and neck squamous cell carcinoma is associated with a better prognosis.

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Source

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Abstract

PURPOSE:

A high frequency of head and neck squamous cell cancers (HNSCC) contain constitutively activated signal transducer and activator of transcription 3 (STAT3). To further elucidate the prognostic role of STAT3 in HNSCC, the expression pattern of STAT3 was correlated with outcome in two independent data sets.

EXPERIMENTAL DESIGN:

STAT3 protein expression analysis was done on a test cohort of 102 patients with HNSCC recruited between 1992 and 2005. Automated quantitative analysis was used to assess STAT3 protein expression. We evaluated associations with clinicopathologic parameters and survival prognosis. Associations were validated in a second, independent cohort of 58 patients with confirmed HNSCC enrolled in the Early Detection Research Network-sponsored study who underwent surgical resection with curative intent at the University of Pittsburgh Medical Center between 2000 and 2004.

RESULTS:

STAT3 displayed mixed nuclear and cytoplasmic staining. Survival analysis showed that high nuclear STAT3 expression (top tertile versus the rest) was associated with longer progression-free survival ($n = 70$, mean survival of 88.9 versus 46.7 months, $P = 0.012$ for the first cohort; $n = 37$, mean survival of 60.3 versus 33.0 months, $P = 0.009$ for the second cohort). After best model selection in the multivariable analysis context, only STAT3 was significant, revealing a lower risk of progression and death for patients with high nuclear STAT3-expressing tumors (hazard ratio, 0.28; 95% confidence interval, 0.10-0.82; $P = 0.019$; and hazard ratio, 0.23; 95% confidence interval, 0.07-0.76; $P = 0.016$, respectively).

CONCLUSIONS:

Our results indicate that high nuclear STAT3 expression levels by automated quantitative analysis are associated with favorable outcome in HNSCC.