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Evaluation of cancer stem cell marker expression as a tool to predict survival and nodal metastasis of patients with oral squamous cell carcinoma

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Oral squamous cell carcinoma (OSCC) is the commonest malignancy, in Sri Lanka, contributing to 19.5% of all cancers detected in both sexes. The aim of the study was to correlate the survival of OSCC in a group of Sri Lankan patients with the expression patterns of five CSC markers namely ALDH1, SOX-2, Bmi-1, C-Met and Oct-4.

One hundred and forty OSCC patients with survival information, diagnosed during a period of 4 years from 2009-2012 were included in the study. Archival OSCC tissues from these patients were used for immunohistochemical investigations with CSC markers, ALDH1, SOX-2, Bmi-1, C-Met and Oct-4 were performed according to the manufacturer's instructions (Abcam Pvt Ltd, UK). Ten high power fields with the most number of positive cells were identified and counted with the average taken as the final score. A tumour was considered to express the CSC maker when >5% of the OSCC cells gave a positive reaction while tumours expressing <5% of positive cells were considered as negative. Survival analysis was performed with SPSS version 20, using Kaplan-Meier survival curves and significance with Chi square test and Breslows (generalized Wilcoxon) test.

The study sample comprised of 9.3% patients younger than 45 years while the rest were older than 46 years at the time of diagnosis. Male to female ratio was 2.8:1. Buccal mucosa was the commonest site of occurrence, contributing to 67.8% of OSCC, followed by tongue (23.6%). The majority (80%) of OSCC patients had TNM stage III or IV disease at diagnosis with 28.6% of patients presenting with pathological confirmed nodal metastasis. Immunohistochemical investigations revealed that 55.7%, 58.6%, 40%, 34.6% and 31.4% of OSCCs showed ALDH1, SOX-2, Bmi-1, C-Met and Oct-4 expression respectively. ALDH1 positivity was significantly associated with nodal metastasis (X^2 =4.6; P=0.03). Although, it did not reach statistical significance, ALDH1 expression was also correlated to poor survival (P=0.06). No statistically significant findings could be observed when the expression of other CSC makers were correlated with nodal metastasis and survival (P>0.05).

In conclusion, out of the five CSC markers investigated in the present study, only ALDH1 showed promise as a potential marker to predict nodal metastasis and survival in the present study sample of OSCC patients.

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