ABSTRACT

Background

Cancers incidence and mortality are rapidly growing worldwide. Head and neck cancer is common in several regions of the world and is on raising trend in developing countries like India. Potentially malignant disorders are more likely to transform into oral cancer. The malignant transformation is often associated with changes at genetic level that in turn is reflected by altered expression of proteins related to cell cycle, proliferation and apoptosis. The finding of immunoexpression of different biomarker such as proliferative marker, pro-apoptotic protein and cancer stem cell marker can be a valuable combination of marker to predict an early malignant transformation of oral epithelial dysplasia and prognosis of oral squamous cell carcinoma. This may be clinically useful to detect early stage of dysplasia and reduce the incidence of oral squamous cell carcinoma, thus assisting the clinician’s decision on the diagnosis, treatment, and prevention strategies.

Aim

Comparison of various areas of biomarkers hTERT, p53, Bax, and LGR5 in leukoplakia with dysplasia and oral squamous cell carcinoma using immunohistochemistry to make a panel of marker to assess the malignant transformation and their prognostic significance.

Material and methods

Tissue samples of two hundred and ten formalin-fixed, paraffin-embedded biopsy specimens were retrieved. The samples were oral leukoplakia with dysplasia (n=90), oral squamous cell carcinoma (n=90) and normal oral epithelium (n=30). The immunohistochemistry analysis for hTRET, p53, Bax and LGR 5 were performed for all selected samples. The percentage of positive cells, tissue and cellular localization were evaluated and analysed for histological Grades of oral epithelial dysplasia and oral squamous cell carcinoma. The comparison of markers was assessed using Chi - square and One- Way ANOVA tests.
Results

In oral epithelium, the expression of hTERT (82.3%), p53 (80%), and LGR 5 (60%) were confined to basal layer but, whereas, Bax expression (76.5%) was predominant in supra basal layers. In oral epithelial dysplasia, supra basal expression of hTERT and p53 were greater with histological Grades but, it was decreased for Bax protein. p53, Bax and LGR 5 expressions were statistically significant among histological Grades of dysplasia (p<0.001) while, hTERT expression was not significant (p-0.674). In oral squamous cell carcinoma, the expression of hTERT, p53, Bax, and LGR 5 were statistically significant between histological Grades (p<0.05). Remarkably, nuclear expression of hTERT was completely shifted to nuclear and cytoplasm with increased Grades of dysplasia and oral squamous cell carcinoma. The association of hTERT, p53, Bax and LGR5 expression was significant among oral epithelium, oral epithelial dysplasia and oral squamous cell carcinoma (p<0.05).

Conclusion

Progressive increased pattern of suprabasal expression of hTERT, p53 and LGR 5 and decreased Bax expression indicate progression of dysplasia into malignant transformation. The significant expression of combination of markers involved in various events of cell cycle recommends their role in predicting early diagnosis of malignant transformation.

Keywords

Immunohistochemistry, Oral Epithelial Dysplasia, Oral Squamous Cell Carcinoma, Htert, p53, Bax, LGR5