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Gaining insight into molecular mechanisms of oral pre-cancer

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Background: The etiology of oral squamous cell carcinoma is complex involving selection of variant cells that develop a growth advantage over and above that of the surrounding normal epithelium. The growth advantage is a combination of increased proliferation and decreased apoptosis to allow cell survival. Despite the significant progress accomplished in the field of OSCC, the diagnosis is performed mostly in advanced stages; thus, appropriate biomarkers need to be identified for the diagnosis of oral pre-cancer cases with high probability of transformation malignance.

Aim: To compare and analyze various molecular pathways in oral cancer and pre-cancer cases in Eastern Indian population to predict early transformation.

Materials & Method: A total of 100 retrospective cases of oral pre-cancer were studied for immunohistochemical expressions of p53, p16, Ki67, MCM3, EpCam, Cathepsin, p63, Glut-1 Bcl2, Bax, E-cadherin and Rb. Activating mutations in H-ras and Notch1 were also checked for using polymerase chain reaction followed by sequencing of the samples. Staining patterns and mutations observed were assessed and compared with that seen in oral cancer cases to predict transformation. The expression patterns were also correlated with tobacco habit history.

Result: An array of alterations in these cases such as increased and altered expression of p53, increased expression of Cathepsin B (protease), increased Bcl-2 expression (an anti-apoptotic marker), decreased E-cadherin expression (cell adhesion molecule), increased GLUT-1 (glucose transporter) expression was observed. The overall prevalence of H-ras mutations and Notch1 in our study groups was found to be 29% and 31%, respectively.

Conclusion: These alterations provide preliminary evidence that these molecules may be an early event in OSCC carcinogenesis and directed therapies may be a useful chemoprevention strategy.

Biography

Devicharan Shetty is the Principal, Professor and Head of the Department of Oral and Maxillofacial Pathology, I.T.S. Dental College Ghaziabad, Uttar Pradesh, India. He has almost 20 years of experience in the subject of oral and maxillofacial pathology. He has authored numerous scientific papers and also serving as an Editorial Board Member in international and national journals of high repute. His areas of interest include molecular basis of oral cancer and diagnostic histopathology of odontogenic cysts and tumors.

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