

Differential expression of basement membrane collagen-IV alpha I to alpha 6 chains during oral carcinogenesis

Type:

Article

Abstract:

This study aimed to resolve if basement membrane (BM) collagen alpha chains undergo remodeling during oral carcinogenesis. Using immunohistochemistry and transmission electron microscopy, we found that BMs in oral epithelial dysplasias (OED: mild, n=10; moderate, n=10; severe, n=10) and carcinoma in situ (CIS) (n=10) differed from normal mucosa (n=6) and oral epithelial hyperplasia (n=5) in showing: (1) excessive lamina densa-like material ultrastructurally, and (2) stronger immunoexpression for alpha 5(IV) than for alpha 1(IV), alpha 2(IV), and alpha 6(IV) chains-findings that implicate these molecules' role as an adhesive template for the attachment and persistence of basal dysplastic cells. Incipient loss of BM integrity in CIS, where alpha 5(IV)/alpha 6(IV) chains were more frequently absent than alpha 1(IV)/alpha 2(IV) chains, suggests that alpha(IV) network disruption is crucial for progression of dysplastic cells into the extracellular compartment, marking transition into the invasive phase. In carcinomatous BM, the disappearance of alpha(IV) chains was more severe in poorly differentiated oral squamous cell carcinoma (OSCC) (n=10) than in well-differentiated OSCC (n=10). In all samples examined, alpha 3(IV) and alpha 4(IV) chains were absent. These findings taken together suggest that BM collagen-IV alpha chains undergo remodeling where selective increase and loss of these molecules are probably early and late events, respectively, during progression of oral dysplasia to cancer.

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Source	Virchows Archiv
ISSN	0945-6317
DOI	10.1007/s00428-006-0260-z
Volume (Issue)	449(3)
Page	358-366
Year	2006

Keyword:

collagen-IV chains,epithelial dysplasia,carcinoma in situ,squamous,cell carcinoma,oral carcinogenesis,defined monoclonal-antibodies,cell carcinomas,basal lamina,tumors immunofluorescence,localization,progression,prognosis,proteins,melanoma

Please Cite As:

TAMAMURA, R., NAGATSUKA, H., SIAR, C. H., KATASE, N., NAITO, I., SADO, Y. & NAGAI, N. 2006. **Differential expression of basement membrane collagen-IV alpha I to alpha 6 chains during oral carcinogenes.** *Virchows Archiv*, 449, 358-366.

URL:

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