Differential expression of canonical and non-canonical Wnt ligands in ameloblastoma

Type:

Article

Abstract:

BACKGROUND: Canonical and non-canonical Wnt signaling pathways modulate diverse cellular processes during embryogenesis and post-natally. Their deregulations have been implicated in cancer development and progression. Wnt signaling is essential for odontogenesis. The ameloblastoma is an odontogenic epithelial neoplasm of enamel organ origin. Altered expressions of Wnts-1, -2, -5a, and -10a are detected in this tumor. The activity of other Wnt members remains unclarified. MATERIALS AND METHODS: Canonical (Wnts-1, -2, -3, -8a, -8b, -10a, and -10b), non-canonical (Wnts-4, -5a, -5b, -6, 7a, -7b, and -11), and indeterminate groups (Wnts-2b and -9b) were examined immunohistochemically in 72 cases of ameloblastoma (19 unicystic [UA], 35 solid/multicystic [SMA], eight desmoplastic [DA], and 10 recurrent [RA]). RESULTS: Canonical Wnt proteins (except Wnt-10b) were heterogeneously expressed in ameloblastoma. Their distribution patterns were distinctive with some overlap. Protein localization was mainly membranous and/or cytoplasmic. Overexpression of Wnt-1 in most subsets (UA = 19/19; SMA = 35/35; DA = 5/8; RA = 7/10) ($P < 0.05$), Wnt-3 in granular cell variant (n = 3/ 3), and Wnt-8b in DA (n = 8/ 8) was key observations. Wnts-8a and -10a demonstrated enhanced expression in tumoral buddings and acanthomatous areas. Noncanonical and indeterminate Wnts were absent except for limited Wnt-7b immunoreactivity in UA (n = 1/ 19) and SMA (n = 1/ 35). Stromal components expressed variable Wnt positivity. CONCLUSION: Differential expression of Wnt ligands in different ameloblastoma subtypes suggests that the canonical and non-canonical Wnt pathways are selectively activated or repressed depending on the tumor cell differentiation status. Canonical Wnt pathway is most likely the main transduction pathway while Wnt-1 might be the key signaling molecule involved in ameloblastoma tumorigenesis. J Oral Pathol Med (2012) 41: 332-339

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