Altered cytokeratin expression during chemoprevention of hamster buccal pouch carcinogenesis by S-allylcysteine

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We examined the effect of S-allylcysteine (SAC), a water-soluble garlic constituent, on cytokeratin expression, a sensitive and specific marker for differentiation status during 7,12-dimethylbenz[a]anthracene (DMBA)-induced hamster buccal pouch (HBP) carcinogenesis in male Syrian hamsters. Hamsters were divided into four groups of six animals each. Animals in group 1 were painted with a 0.5% solution of DMBA in liquid paraffin on the right buccal pouches three times a week for 14 weeks. Group 2 animals were painted with DMBA as in group 1, and in addition they received orally 200 mg/kg of SAC on days alternate to DMBA application. Group 3 animals received SAC as in group 2. Group 4 animals received neither DMBA nor SAC and served as the control. The hamsters were killed after an experimental period of 14 weeks. Cytokeratin expression was detected by Western blot analysis using monoclonal antibodies AE1 and AE3. In DMBA-induced HBP tumors, the decreased expression of high molecular weight cytokeratins of molecular mass between 55–70 kDa was observed. Administration of SAC (200 mg/kg) to animals painted with DMBA suppressed the incidence of DMBA-induced carcinomas and was associated with restoration of normal cytokeratin expression. The results of the present study suggest that inhibition of HBP tumorigenesis by SAC may be due to its regulatory effects on differentiation, tumor invasiveness, and its ability to migrate and form metastases.

Key words: DMBA, chemoprevention, oral cancer, hamster buccal pouch, cytokeratins, garlic, S-allylcysteine

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