



Risk factors in oral and oropharyngeal squamous cell carcinoma: a population-based case-control study in southern Sweden.

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Abstract:

In the year 2002, about 275,000 inhabitants around the world developed oral cancer and over half of them will die of their disease within 5 years. Oral and oropharyngeal squamous cell carcinoma (OOSCC) accounts for about 1% of all cancers in Sweden - which is low compared to the incidence on the Indian subcontinent and in other parts of Asia, where it is one of the most common forms of cancer. The incidence in Sweden is increasing, however. The study comprised 80% (132/165) of all consecutive cases living in the Southern Healthcare Region, born in Sweden and without previous cancer diagnosis (except skin cancer), who were diagnosed with OOSCC during the period September 2000 to January 2004. Using the Swedish Population Register, 396 cancer-free controls were identified and matched by age, gender and county. Of these individuals, 320 (81%) agreed to take part in the study. Cases and controls were subjected to a standardised interview, identical oral examinations including panoramic radiographs, and cell sampling for human papillomavirus (HPV) analysis. In total 128 patients with planned curative treatment were followed for a median time of 22 months (range 0 - 36). The aims were to assess different potential risk factors in OOSCC such as oral hygiene, dental status, oral mucosal lesions, alcohol and tobacco use, virus infection, and some related to lifestyle. A further aim was to assess the influence of these factors on recurrence or occurrence of a new second primary tumour (SPT) of squamous cell carcinoma. In multivariate analysis average oral hygiene (OR 2.0; 95% CI 1.1-3.6) and poor oral hygiene (OR 5.3; 95% CI 2.5-11.3), more than 5 defective teeth (OR 3.1; 95% CI 1.2-8.2) and more than 20 teeth missing (OR 3.4; 95% CI 1.4-8.5), as well as defective or malfunctioning complete dentures (OR 3.8; 95% CI 1.3-11.4) were identified as significant risk factors for development of OOSCC. Regular dental care reduced the risk of OOSCC (OR 0.4; 95% CI 0.2-0.6). The cases reported a higher consumption of alcohol than the controls. More than 350 g of alcohol per week (OR 2.6; 95% CI 1.3-5.4) and 11-20 cigarettes per day (OR 2.4; 95% CI 1.3-4.1) were dose-dependent risk factors. The results showed a tendency for women to have a greater risk (OR 1.8) than men at any given level of tobacco consumption. There was no increased risk of OOSCC among users of Swedish moist snuff. There was a significant relationship between high-risk human papillomavirus (HPV) infection and OOSCC (OR 63; 95% CI 14-280). Forty-seven of the cases (36%) were high-risk HPV infected and 7 (5.3%) were low-risk HPV infected in the specimens collected from the oral cavity. The corresponding figures for the controls were 3 (0.94%) and 13 (4.1%), respectively. The high-risk HPV types found in the oral cavity were the same types as observed in cervical cancer. Tumour stage was associated with both higher relative rate (RR) of recurrence or second primary tumour (SPT) of squamous cell carcinoma, and death in intercurrent diseases (DICD), defined as death before the occurrence of recurrence or SPT. High-risk HPV infected patients had an almost threefold increased RR of recurrence/SPT, but seemingly a lower RR of DICD compared to high-risk negative cases. Patients with tonsillar carcinoma had a significantly higher cause-specific RR of recurrence/SPT (RR 2.06; CI 0.99 - 4.28) compared to patients with OSCC of other sites. High alcohol consumption was associated with a high RR of recurrence/SPT, but not with DICD. There was no increased RR of recurrence/SPT related to smoking, but an association between smoking and DICD. In conclusion, the results in this study confirm that both smoking tobacco and alcohol consumption are risk factors for OOSCC. The use of Swedish moist snuff had no effect on the risk. Independent risk factors identified are poor oral hygiene, inadequate dental status and malfunctioning complete dentures. Regular dental check-ups are a preventive factor. Among other possible risk factors studied, high-risk HPV infection appears to be the strongest. High-risk HPV infection increases the cause-specific RR of recurrence or SPT. Tumour stage influences the rate of recurrence/SPT.

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