Socioeconomic status and head and neck cancer

Abstracted from

Conway DI, McMahon AD, Smith K, *et al*.

Components of socioeconomic risk associated with head and neck cancer: a population-based case–control study in Scotland. *Br J Oral Maxillofac Surg* 2010; **48:** 11–17

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Question: What are the socioeconomic risk factors for head and neck cancers?

Design This was a population-based case–control study.

Case–control selection Eligible patients were aged between 18 and 80 years and had a primary histopathological diagnosis made between April 2002 and December 2004. Diagnosis included malignant cancers of the oral cavity, oropharynx, hypopharynx or larynx. Incident cases were identified through weekly monitoring of head and neck cancer clinics in hospital departments and were confirmed by pathology department records. Controls matched by age (5-year age band) and sex were randomly selected from the lists of general practitioners.

Data analysis Information about occupation, education, smoking and alcohol consumption was collected at personal interview. Socioeconomic circumstances were measured at an individual level (education, occupational social class, unemployment), and by area-based measures of deprivation. Odds ratios (OR) and corresponding 95% confidence intervals (CI) were computed by unconditional logistic regression and were adjusted for age and sex. This model was repeated to assess for potential independent effects of the range of socioeconomic components after adjusting for smoking and alcohol consumption. Interactions between smoking and consumption of alcohol, and between individual and area-based measures for socioeconomic factors were tested by the likelihood ratio test. In addition, the most important behavioural risk factors and socioeconomic variables were entered into a stepwise multivariate logistic regression model. All statistical analyses were carried out using Statistical Analysis System (SAS; Cary, North Carolina, USA) software.

Results The study population included 103 cancer patients (38 women and 65 men), and 91 controls (39 women and 52 men). Individuals living in the most deprived areas (OR, 4.66; 95% CI, 1.79–12.18) and those who were unemployed (OR, 2.27; 95% CI, 1.21–4.26) had a significantly higher risk of cancer than people who had high levels of educational attainment (OR, 0.17; 95% CI, 0.05–0.58). Significance was lost for all measures of social class when adjustments were made for smoking and consumption of alcohol. When the most important behavioural and socioeconomic factors were combined in a fully adjusted multivariate analysis, smoking was the only significant risk factor (OR, 15.53; 95% CI, 5.36–44.99) found to be independently associated with head and neck cancers.

Conclusions A high risk of head and neck cancer was consistently associated with poor socioeconomic circumstances. There were strong links for specific components but smoking dominated the overall profile of risk. More detailed research into the nature of such associations is needed in the future.

Commentary

The incidence of head and neck cancers continues to rise in the UK, especially in Scotland. The use of tobacco products, together with heavy alcohol consumption, are the main risk factors for these cancers. Furthermore, infection with the human papilloma virus (HPV), especially HPV16, has been strongly linked to the disease. The association between head and neck cancers and socioeconomic factors remains under-researched and poorly understood, and, therefore, this study is very relevant. Conway and colleagues investigated components of socioeconomic status and their impact on the risk of head and neck cancers in a case–control study. The selection criteria of cases and controls were rigorous. Only histologically-confirmed incident cancer cases were included, and controls were population-based. Furthermore, the study captured both individual and area-based risk measures.

Results showed that individuals living in the most deprived areas as well as those with a lifetime experience of unemployment had a statistically significant elevated risk of head and neck cancer, whereas high levels of education were associated with a low risk of the disease. The effect of education may be attributed to its influence on risky behaviours and lifestyle choices. When socioeconomic factors were adjusted for smoking and consumption of alcohol, statistical significance was lost. Although smoking and alcohol consumption dampened these associations, a trend of increasing risk for head and neck cancers with severe deprivation, low education and unemployment was observed. When behavioural risk factors and socioeconomic variables were entered into a multivariate model, smoking was the only independent variable found to be significantly associated with head and neck cancers. Cancer patients in the experimental group were mainly heavy smokers; therefore, it is not surprising to detect a strong association between these cancers and smoking. This result corresponds to similar findings from numerous other studies.

Multivariate analysis found that consumption of alcohol was not significantly associated with head and neck cancers, despite evidence of a higher risk in those consuming more than 2.25 and up to 4.70 units per week. Furthermore, there was no evidence of a combined effect of smoking and alcohol consumption on cancer risk. These findings are surprising, given the body of evidence, and

may have resulted from the prevalent consumption of alcohol in cases and controls as well as the small sample size. A study by Hindle *et al*. found that alcohol consumption in England and Wales since the 1950s is more closely related to increased oral cancer incidence and mortality than smoking, most notably among younger males.[1] This is particularly alarming in light of recent reports on increased binge drinking behaviour in the UK. In addition, studies have demonstrated that tobacco and alcohol products interact synergistically and increase each other's harmful effects.[2,3] The dehydrating effect of alcohol on cell walls enhances the ability of tobacco carcinogens to penetrate tissues. It is important to note, however, that a key difficulty in the study of tobacco and alcohol as risk factors is that most head and neck cancer patients have used both products.

This work had a number of limitations. The low response rate for both groups may have made the study population unrepresentative. The small sample size reduced the study's statistical power and the ability to explore the independent effects of socioeconomic and behavioural risk factors. In addition, recall bias regarding exposure to risk factors, especially among cases, is an inherent limitation in case–control studies.

In conclusion, the study showed that lower socioeconomic status is associated with an increased risk for head and neck cancers. It was unclear how individual socioeconomic status components could explain this association. Nevertheless, socioeconomic factors have a well-known impact on lifestyle. Smoking and alcohol consumption are coping mechanisms in individuals with low socioeconomic status. These behaviours can also result from cultural norms in certain regions, as may be the case in Scotland. Consequently, more research is needed in this area using larger study populations. Finally, the novel analytical framework of this study may serve as an impetus for future studies aiming to explore socioeconomic risks associated with head and neck cancers.

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Evidence-Based Dentistry (2010) **11**, 57-58. doi:10.1038/sj.ebd.6400726