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Socioeconomic determinants as risk factors for squamous cell carcinoma of the head and neck: a case-control study in Iran

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Abstract

Our aim was to assess the association between different components of sociodemographic status and the risk of developing squamous cell carcinoma (SCC) of the head and neck after we had adjusted for the influence of the known behavioural risk factors of smoking and drinking alcohol. We selected 146 patients with histopathologically-confirmed SCC of the head and neck, and matched them for age and sex with 266 healthy controls for this case-control study. Personal details, occupation, socioeconomic status, smoking, and alcohol consumption were recorded. The association of sociodemographic variables with oral cancer was evaluated both separately and with a composite socioeconomic index. Chi squared tests, adjusted odds ratios (OR), and 95% CI were computed using logistic regression to estimate the effect. There was a significant difference between the two groups in the composite socioeconomic index ($p < 0.001$). The group with “low” socioeconomic status had the highest risk of oral cancer (OR = 3.89, 95% CI 1.28 to 11.82). Better-educated people with higher incomes had a lower risk of SCC of the head and neck after we had controlled for behavioural risk factors. However, marital and employment status and place of residence were not significantly associated with risk. Our findings confirm that some socioeconomic determinants were associated with the development of oral cancer in this study group.

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Keywords: Case-control; Head and neck cancer; Risk factor; Socioeconomic; Sociodemographic

Introduction

The prevalence of cancers of the head and neck (including the lip, the oral cavity, and the nasopharynx, pharynx, and larynx) has been estimated to be more than 5.5 million globally,^{1,2} and squamous cell carcinoma (SCC) is the most common. Smoking, chewing tobacco, drinking alcohol, HPV, and a poor diet have been proposed as risk factors.^{3,4}

Many studies have suggested that oral cancer is more common in socioeconomically deprived populations, but the underlying aetiology of this is yet to be proved.² In addition, there has been no general agreement in previous studies about measures of socioeconomic status in which its relation with the epidemiology of cancer has been studied, and results are inconsistent.^{2,5,6}

The variation in geographical and regional incidences of oral cancer suggests that cultural, demographic, and social factors could have an important role in carcinogenesis.^{7,8} While each country certainly shares common socioeconomic characteristics, there may be differences in the distribution of components of socioeconomic status, particularly in devel-

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Table 1

Socioeconomic composite scores based on categories of income and education level. Categories were based on their distribution among all patients.

	Very dissatisfied	Dissatisfied	Satisfied	Very satisfied
<12	Low	Low	Middle	Middle
12	Low	Middle	Middle	High
More than 12	Middle	Middle	High	High

oping countries, because of unavailable or unreliable data about levels of income, and difficulties in the evaluation of occupation (particularly where formal occupations are less common among women).⁶ The accessibility (including availability and affordability) of healthcare in each country could also be an important factor that contributes to the association between socioeconomic status and the prevalence of SCC of the head and neck.

The aim of this study was to investigate the association between confirmed SCC of the head and neck and indicators of socioeconomic status (occupation of the head of the family, level of income, education and place of residence) in a developing country, Iran.

Methods

This matched case-control study was done at the Imam Khomeini Hospital Complex, Tehran, Iran, during 2016–17. The Medical Oncology Department (Cancer Institute) of this hospital treats patients from both rural and urban areas from all around the country.

The research project was approved by the Alborz University of Medical Sciences, Karaj, Iran, Ethics Committee. The purpose of the study was fully explained to all participants, and informed consent was obtained from all. All participants were assured of anonymity and confidentiality.

Patients

Patients with cancers of the head and neck aged 18 years or over with a histologically confirmed SCC were identified from the records of the hospital's outpatient dental clinic, where patients referred from the Medical Oncology Department were given pretreatment dental clearance. Those who had had cancer previously, or who had any other malignancy, were excluded. The sample size was calculated to include 150 patients, according to the formula for comparing two qualitative proportions in two independent populations (power = 80%, α = 5%, 10% loss of participation).

Controls

Controls matched by age and sex were selected from the same hospital, from people in waiting rooms and outpatient clinics, during the same period as the patients with SCC, to ensure the same exposure patterns in the source population. The selection criteria for controls were: 18 years old or more, not

diagnosed with any cancer, and not complaining of memory loss. Eligible controls were approached in random order (to avoid selection bias) until one agreed to participate. Some cases had one matched control, but most had two. All the control participants were examined to make sure that they did not have oral cancer.

Protocol of the study

Information was collected from cases and controls using a self-administered structured questionnaire, which included personal and socioeconomic characteristics (age, sex, marital status, education, occupation of the head of the family, place of residence, and satisfaction with income), smoking and alcohol consumption, a brief medical history, and family history of cancer. Questions that were easy to recall were used, to avoid recall bias. A trained interviewer was available for assistance and response to any questions participants might have had.

Outcome variables

The outcome was diagnosis of SCC of the head and neck (lip and oral cavity, nasopharynx, pharynx, and larynx), confirmed by histopathological examination.

Explanatory variables

Patients who smoked or had smoked were recorded as current or ex-smokers; the rest as non-smokers. Other types of tobacco, and consumption of alcohol, were recorded as “yes” or “no”. A simple “yes/no” question was used to record a family history of cancer.

Marital status was recorded as married, single, or other (including divorced and widowed), place of residence as urban or rural, and educational attainment as years of study successfully completed. It was then subdivided into three subgroups: less than high school diploma, high school diploma, further than high school diploma.⁹ Employment was recorded as unemployed, employed, or other (including students, housewives, and retired people). The employed group was further subdivided into labour and related, employed (public or private), self-employed, and managerial/professional.⁹ We also requested participants to state who was the head of the family in employment, when different from their own. The head of the family's employment was used for analysis. A composite score for socioeconomic status was then created based on the method described by Dahlstrom et al

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