Oral and Pharyngeal Cancer: Knowledge and Opinions of Dentists in British Columbia and Nova Scotia

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Abstract

Oral and pharyngeal cancers are largely preventable and can be successfully treated when diagnosed at an early stage. Dentists in British Columbia and Nova Scotia were surveyed regarding their knowledge and opinions about oral and pharyngeal cancer. In February 1998 a pretested 41-item survey was mailed to a random sample of dentists in British Columbia and the population of dentists in Nova Scotia. A reminder postcard and one additional mailing were sent to nonrespondents. Of the 670 dentists supplying usable responses (response rate 55.2%) only 56.7% agreed that their knowledge of the subject was current. Most dentists correctly identified tobacco use (99.4%) and alcohol use (90.4%) as risk factors, but fewer correctly identified factors such as the use of spicy foods (57.0%) and poor oral hygiene (46.3%) as not being risk factors. Only 42.5% identified both erythroplakia and leukoplaikia, in that order, as the conditions most likely associated with oral cancer. Indices of risk and diagnostic knowledge were constructed by summing the number of correct responses to items in each domain. On 16 risk factors the mean correct score was 9.2, and on 14 diagnostic procedures the mean correct score was 10.0. Only 38.5% of dentists had consistent levels of knowledge on both indices. Differences between the provinces were statistically significant \( p < 0.01 \) for only 2 knowledge items. About three-quarters of all dentists (77.0%) were interested in taking continuing education courses. Dentists in British Columbia and Nova Scotia could benefit from undergraduate and continuing education courses to increase their knowledge of risk and diagnostic factors for oral cancer.

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for cancer of both the salivary gland and the nasopharynx are 10 to 25 times higher among the Inuit than within the general Canadian population.

Most oral cancers are attributed to the use of tobacco products that are smoked or chewed. The combined use of tobacco and alcohol significantly increases the risk of these cancers. Other risk factors include actinic radiation for lip cancer, a lack of fruits and vegetables in the diet, and human papillomavirus.

Early detection is the single most critical intervention influencing survival. The oral cavity is easily accessible and can be examined with little discomfort. Dentists, as primary care providers, can easily incorporate the screening protocol into their routine examinations.

Studies of dentists in the United States and Europe have assessed their knowledge, opinions and practices regarding oral cancer. Surveys in the state of Maryland and the United States as a whole have shown that dentists are not as knowledgeable as they could be about preventing and detecting oral cancer.

The purposes of this study were to assess and describe Canadian dentists' understanding of risk and diagnostic factors related to oral cancer and to determine their opinions about their professional preparation to prevent and control oral cancer.

Methods

Dentists' knowledge and opinions related to oral cancer were determined by means of a mail survey of a probability sample in British Columbia and the population of dentists in Nova Scotia. A 41-item questionnaire was constructed from items previously tested for validity and new ones unique to this survey. The instrument was validated in Canada and was pretested by a convenience sample of dentists in 3 nonsurvey provinces. A systematic random sample of 817 licensed dentists was selected from the registrars' 1997 listing of licensees in British Columbia to provide a 95% confidence level with oversampling for an expected return of 40%. The population of dentists in Nova Scotia were those licensees represented by a set of mailing labels purchased from the Nova Scotia Dental Association (membership in the professional association is mandatory for licensure in that province). The questionnaire, a cover letter and an addressed, stamped envelope were mailed in February 1998. A reminder card was sent 2 weeks after the initial mailing, and a second complete mailing was sent to all nonrespondents 4 weeks after the initial mailing.

Responses were analyzed with SPSS-PC software (SPSS Inc., Chicago, IL). Unweighted data were used in the bivariate analyses. The results were evaluated at a significance level of $p < 0.01$.

Analyses included the frequencies of 30 knowledge-related items and cross-tabular comparisons of these frequencies between the 2 provinces. Two indices were constructed to consolidate knowledge of risks and diagnostic factors. Each correct response for the 16 items regarding risk factors was given a score of 1, and the correct scores were summed to yield an index of risk knowledge. Similarly, a diagnostic index was constructed by summing the number of correct responses to the 14 items regarding diagnosis.

Each index score was grouped into 3 approximately equal distributions by percentage to identify low, medium and high scores. These scores were used to construct a typology of dentists' patterns of knowledge of risk and diagnostic factors for oral cancer.

The correlation between the 2 indices was examined with one-way analysis of variance (ANOVA) comparing the mean aggregate scores of dentists in the 2 provinces on both indices. The relative effects of background characteristics on the risk and diagnostic indices were also assessed. Finally, the relationships between dentists' levels of knowledge and their opinions about the currency of their knowledge were explored.

Results

The results are based on 670 usable responses (overall response rate of 55.2%, 50.4% [401] for British Columbia and 64.4% [269] for Nova Scotia). In total, 82.1% of respondents were men. More than half owned solo practices, whereas about a quarter practised in partnerships and a smaller proportion were employees or contractors. Nearly 60% had graduated between 1980 and 1997, and a similar proportion had attended a continuing education course on oral cancer within the previous 5 years.
Knowledge of Risk Factors for Oral Cancer

Tobacco was recognized as a risk factor by almost all respondents, and other high risk factors such as prior oral cancer, use of alcohol and lip cancer related to sun exposure were correctly identified by at least 70% of respondents (Fig. 1). However, human papillomavirus and low consumption of fruits and vegetables were identified by much smaller proportions. Although most respondents knew that older age is a high risk factor, fewer than half knew that most oral cancers are found in patients 60 years of age or older.

Factors that have not been shown to pose a risk for oral cancer (“nonrisk”) were identified correctly by fewer respondents (Fig. 1). More than half knew that hot beverages and food, spicy foods and obesity are not real risk factors. However, fewer than half knew that poor oral hygiene, familial clustering of cancer and poor-fitting dentures are not real risk factors, and only a small proportion knew that a family history of cancer is not in itself a risk factor for oral cancer.

Scores on the 16-item index of dentists’ knowledge of risk factors ranged from 0 to 15 (mean 9.2). For only one risk item was the response significantly different between the provinces: a higher percentage of N.S. dentists correctly identified the association of oral cancer with lip cancer related to sun exposure (p < 0.01). There were no statistically significant differences between the provinces in terms of mean risk scores.

Knowledge of Diagnostic Procedures for Oral Cancer

Two diagnostic procedures were correctly identified by most respondents (Fig. 2), that early detection improves the 5-year survival rate and that oral cancer examination should not be discontinued after 3 negative exams. The procedure for complete examination of the tongue, the fact that early oral cancer is asymptomatic, and the appearance of early oral cancer lesions were correctly identified by large numbers of respondents. Just over half knew that most oral cancer is diagnosed at an advanced stage. However, fewer than half recognized the 2 conditions (erythroplakia and leukoplakia, in that order) most likely to be associated with oral cancer.

Scores on the 14-item index of dentists’ knowledge of diagnostic procedures ranged from 0 to 14 (mean 10.0). For only one diagnostic item was the response significantly different between the provinces: a higher percentage of B.C. dentists correctly identified that lesions associated with smokeless tobacco generally resolve with discontinuation of such products (p < 0.001). There were no statistically significant differences between the provinces in terms of mean diagnostic scores.
Dentists were cross-classified on each of the 2 indices to determine their patterns of knowledge of risks and diagnostic procedures (Table 3). Nearly 39% of the dentists had consistent levels of knowledge on both indices. Of the dentists whose scores were inconsistent, about 33% had better knowledge of risk factors than diagnostic procedures, and about 29% had better knowledge of diagnostic procedures than risk factors.

Although there was a statistically significant relationship between the 2 indices, the correlation was not strong (Pearson's r = 0.31). This result confirms that risk factors and diagnostic procedures represent distinguishable areas of knowledge. One scale predicts less than 10% of the variance in the other.

Dentists' Background Characteristics and Knowledge of Oral Cancer

Six background characteristics (sex, year of graduation, primary practice setting, timing of most recent continuing education course, belief that one's knowledge of oral cancer was current and number of patients seen per week) were explored in relationship to each of the 2 knowledge indices. Only year of graduation was significantly associated with the risk index (p < 0.001). Both year of graduation and timing of most recent continuing education course were significantly associated with the diagnostic index (p < 0.001).

Currency of Knowledge and Adequacy of Undergraduate Education

Overall, 56.7% of the dentists agreed that their knowledge of oral cancer was current. A large proportion (32.1% in British Columbia and 29.8% in Nova Scotia) disagreed that their knowledge was current. More than three-quarters (77.0%) indicated an interest in taking continuing education courses.

Discussion

Although the reported response rate for this survey was less than desirable, it was based on a conservative assessment of responses. Only dentists who stated that they were not in clinical practice at the time of the survey were omitted from the target population, whereas all surveys not returned, stamped “address unknown” or returned...
unopened were included in the calculation. Nonetheless, the response rate was higher than for the U.S. study (50%)\(^{19}\) and the Maryland study (54%).\(^{17}\) Although the results, based on unweighted data, cannot be generalized to all dentists in British Columbia or to other provinces, the results for Nova Scotia represent the population of dentists in that province. The results probably reflect higher levels of knowledge about oral cancer and higher levels of interest in continuing education courses on this subject among responding dentists than among all dentists.

The dentists responding to this survey knew most of the real risk factors for oral cancer, particularly use of tobacco and alcohol, although less than half knew that most cases of oral cancer are diagnosed in people 60 years of age or older. Dentists were much less certain about factors that do not pose a risk. The smaller proportions of dentists who correctly reported factors such as poor oral hygiene and a family history of cancer as not posing a risk indicate a relatively high level of misinformation among these practitioners (Fig. 1).

Similarly, dentists’ knowledge of diagnostic procedures indicates specific areas of misinformation or lack of information. Although almost 80% knew that the tongue is one of the 2 most common sites of oral cancer and two-thirds knew that the floor of the mouth is the other most common site, only 56% identified both sites. Nearly everyone understood that early detection improves 5-year survival rates, but only about half knew that most oral cancer is diagnosed at a late stage. Finally, although current evidence clearly shows that red lesions or red and white mixed lesions are most likely associated with oral cancers,\(^{8}\) only 42.5% correctly identified erythroplakia and leukoplakia, in that order, as the 2 lesions most likely to be associated with these cancers.

The highly significant relationship between high scores on both indices and year of graduation may reflect increasing attention to oral cancer in the undergraduate curriculum in more recent years. Similarly, the highly significant relationship between high scores on the diagnostic index and a recent continuing education course affirms the positive effect of such activities. Although these are clear indications of the benefits of recent education, the large proportion of dentists who had low or medium scores on one or both indices (53.1%; see Table 3) demonstrates a conspicuous need for further educational interventions regarding both risk factors and diagnostic procedures. Overall, the pattern of correct identification of real risk factors, nonrisk factors and diagnostic procedures was nearly identical with that found in the survey of U.S. dentists.\(^{19}\)

Although 56.7% of dentists agreed that their knowledge was current, nearly one-third disagreed, which suggests that many dentists are aware of their lack of knowledge and are not confident about their knowledge and practices. These findings concerning dentists’ knowledge and opinions related to oral and pharyngeal cancer suggest strongly that educational interventions for practitioners and dental students are necessary. Current undergraduate curricula and continuing education for graduates might effectively address the gaps identified in these findings through a range of educational strategies. Practitioners must have current knowledge of risk factors for oral cancer, the factors that do not pose any risk, and diagnostic procedures to assess patient health, to enable them to provide oral cancer examination and to assist patients in reducing their risk through tobacco cessation counselling and other patient education. As these results are not generalizable to other regions, it may be expedient to determine levels of knowledge regarding oral cancer risks and diagnostic procedures in other provinces and territories.

### Conclusions

Although this survey demonstrated gaps in dentists’ knowledge about oral cancer, it also demonstrated their understanding of their needs in this area and a willingness to undertake additional education. We caution, however, that the survey results are probably better than would be the case for nonresponding dentists.

In addition to their role in the prevention and early detection of oral cancer, dentists are instrumental in providing health education to patients and the community. Dentists share, with other health care providers, responsibility for closing the gap between public knowledge and

<table>
<thead>
<tr>
<th>Knowledge of risk factors(^a)</th>
<th>Low score (0–8 items)</th>
<th>Medium score (9 or 10 items)</th>
<th>High score (11–16 items)</th>
<th>All dentists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low score (0–8 items)</td>
<td>16.9</td>
<td>12.5</td>
<td>5.7</td>
<td>35.1</td>
</tr>
<tr>
<td>Medium score (9 or 10 items)</td>
<td>12.5</td>
<td>11.2</td>
<td>10.6</td>
<td>34.3</td>
</tr>
<tr>
<td>High score (11–16 items)</td>
<td>7.0</td>
<td>13.1</td>
<td>10.4</td>
<td>30.6</td>
</tr>
<tr>
<td>All dentists</td>
<td>35.4</td>
<td>36.9</td>
<td>26.7</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\(^a\)Total of 16 risk items

\(^b\)Total of 14 diagnostic items
public behaviour by using and disseminating scientific findings. Effective health education and health promotion strategies for both health care professionals and the public are requisite to the transfer of scientific knowledge.\textsuperscript{23}

The morbidity and mortality associated with oral and pharyngeal cancers is a significant social burden even though, when diagnosed at an early stage, such cancers can be successfully treated. Relative to the other 2 more prominent oral diseases, dental caries and periodontal disease, oral cancer receives less attention in both the public and oral health professional domains. The crucial role of dentists in reducing the individual and social burden associated with oral cancer requires appropriate knowledge and practices. Intentional and appropriately designed educational interventions can enhance practitioner knowledge and practice in this area. \textbullet

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