

# Patient Awareness of Head and Neck Cancer Risk Factors: Assessment of the General Otolaryngology Population

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## Abstract

**OBJECTIVE:** The general public's knowledge of the risk factors for head and neck cancer is lacking. The otolaryngology clinic population level of awareness has not yet been reported in the literature. **DESIGN:** Individual cohort study **SETTING:** Tertiary academic center **PARTICIPANTS:** We conducted an anonymous survey of all patients presenting to otolaryngology clinic to assess knowledge of head and neck cancer risk factors. **MAIN OUTCOME MEASURES:** The main outcome measures were percentage of correct responses for each cancer risk factor and comparison of percent correct between cancer and non-cancer patients. **RESULTS:** A total of 510 patients were enrolled in the study including 69 patients (13.5%) with a history of head and neck cancer. The most well recognized risk factors by all patients were cigarettes (83.7%) and chewing tobacco (77.5%). Twenty-nine percent of patients correctly identified alcohol as a risk factor. Additional risk factors were poorly recognized. Cancer patients had a similar or better correct response rate than non-cancer patients except for chewing tobacco (68.1% vs 78.9% respectively). **CONCLUSION:** The general otolaryngology clinic population, especially patients with a history of head and neck cancer, demonstrated improved knowledge of some risk factors for head and neck cancer, but insufficient awareness of alcohol and HPV transmissible behaviors.

## KEY POINTS:

1. Over 75% of otolaryngology patients are aware of the carcinogenic effects of tobacco for head and neck cancer.
2. Less than a third of ENT patients know alcohol is a risk factor for head and neck cancer.
3. With the rise in HPV related cancers, knowledge of the high risk sexual behaviors associated with HPV head and neck cancer is poor.
4. Patients with a history of head and neck cancer have mildly increased awareness of risk factors for head and neck cancer including alcohol and high risk sexual behavior.
5. As an otolaryngology community, physicians need to intensify their educational outreach to promote more widespread knowledge of the risk factors for head and neck cancer.

## INTRODUCTION:

Head and neck cancer is a significant cause of morbidity and mortality in the United States, with an estimated 63,030 new cases and 13,360 deaths of oral cavity, pharynx, and larynx cancer in 2017<sup>1</sup>. The general population knowledge of head and neck cancer and its risk factors is poor<sup>2</sup>. The general population is most familiar with smoking as a risk factor for head and neck cancer (HNC), with 54 – 65% correctly identifying smoking as a risk factor<sup>2-4</sup>. With the rise in Human Papilloma Virus (HPV) related cancers of the head and neck, public awareness of this viral risk factor has increased but is still only at 12 - 28%<sup>2-4</sup>. One of our main concerns and the motivation for pursuing this study is the lack of knowledge of alcohol as a risk factor for HNC that we have seen among our own patients. Previous surveys of the adult population show a wide

range of awareness, with 4.8 - 40% of surveyed adults aware that alcohol is a risk factor for HNC<sup>2-4</sup>. The knowledge of the general otolaryngology patient population regarding head and neck cancer risk factors is currently unknown. Previous United States studies have focused on college students, patients presenting to free cancer screening programs, American Indians, rural populations, predominantly black populations, and the general public<sup>2-7</sup>.

Our purpose in this study was to assess the baseline awareness of the risk factors for head and neck cancer among the general otolaryngology clinic population in an academic setting in the greater Albany, NY area. We hypothesized that the otolaryngology patient population will have improved knowledge of head and neck cancer risk factors, compared to the general population as surveyed by Luryi et al. In addition, patients already diagnosed with head and neck cancer at time of survey are expected to have improved awareness of HNC risk factors compared to the general otolaryngology patient population without head and neck cancer.

## **MATERIALS & METHODS:**

All patients at check-in for their otolaryngology clinic appointment were given a survey with attached informational sheet describing the study. Clinic staff were instructed to advise patients that we were conducting a survey to assess head and neck cancer awareness and that patient participation was voluntary. Completed surveys were collected by clinic staff prior to check-out. Survey answers and educational information were displayed at the check-out desk to prevent them being seen prior to completing the survey. Surveys were later numbered for record keeping in a randomized blocking schedule.

Patients were included if they were able to read and write in the English language and were willing to participate in the survey. Albany County is predominantly English-speaking (86%) and this is reflected in our clinic population.<sup>8</sup> Patients were excluded if they did not answer whether they had a history of head and neck cancer at the bottom of the survey page or if they made annotations on the survey that indicated they were answering the questions as their own personal social history or did not understand the survey. Goal patient accrual was 500 patients with at least 50 patients in the head and neck cancer group based on power calculations.

The survey asked patients to identify which of 19 different factors had been scientifically proven to contribute to head and neck cancer as shown in Figure 1. Acid reflux was later omitted from analysis due to inconsistent data in the literature. Patients were instructed that not all factors listed were contributors to head and neck cancer. Patients were additionally asked if this was their first time completing the survey, if they had been previously diagnosed with head and neck cancer, and their reason for otolaryngology appointment.

All surveys that met inclusion/exclusion criteria were entered into Excel for data analysis. Demographic data including prior diagnosis of head and neck cancer and reason for visit (primary complaint) were tabulated. Percentage of patients correctly identifying each item as a contributor or non-contributor to head and neck cancer was calculated and compared between the cancer patients and non-cancer patients using chi-square analysis. A standard p value of less than 0.05 was used to determine significance. The data that support the findings of this study are available from the corresponding author upon reasonable request.

## **RESULTS:**

Over a 14 month period, 510 patients completed the survey and fulfilled inclusion/exclusion criteria. The majority of patients (86.5%) had no history of head and neck cancer (Table 1). The most common reason for clinic visit was an ear primary complaint (N=292, 57.43% of total patients) as seen in Table 2. This was followed by voice issue (N=176, 34.5%) and non-cancerous mouth/throat issue (N=139, 27.3%). Patients responded with multiple primary complaints and as such the total N in Table 2 is 830, however, percentages were calculated based on total number of patients (510).

Our primary outcome was to assess the baseline awareness of head and neck cancer (HNC) risk factors among the general otolaryngology patient population. The most well recognized risk factors were smoking cigarettes and chewing tobacco with 83.7% and 77.5% of patients with correct survey answers, respectively (Table 3). Only 29.0% of patients identified alcohol as a risk factor for HNC. Patients had little knowledge

of the other positive risk factors: not brushing teeth (26.3%), oral sex (21.8%), betel quid (14.5%), and mouthwash (6.1%). The survey contained additional factors that have not been proven to be a positive risk factor for head and neck cancer in the most recent literature. These factors, i.e. non-risk factors, included microwaved plastic, smoking marijuana, artificial sweeteners, kissing, cocaine, heroin, methamphetamines, spicy foods, salty foods, e-cigarettes, and eating marijuana. The majority of patients correctly identified these non-risk factors as not contributing to HNC. However, 42.5% of patients believed e-cigarettes have a carcinogenic effect in HNC.

Our secondary goal in this study was to assess the difference in risk factor knowledge between patients with a history of HNC and those without. There were 69 patients with a history of HNC that completed the survey. Of HNC patients, 40.6% of patients identified alcohol as a risk factor compared to 27.2% of non-HNC patients (Table 3). HNC patients more frequently identified oral sex as a risk factor for head and neck cancer (33.3% vs 20.0%). Drugs with no causative link to HNC including heroin, methamphetamines, and cocaine were more often correctly identified as non-carcinogenic factors by cancer patients (Table 3). However, non-cancer patients more often correctly reported chewing tobacco as a risk factor (78.9%) compared to 68.1% of HNC patients. The remainder of the risk factors did not show a statistically significant difference in answers between cancer and non-cancer patients.

## DISCUSSION:

There have been increasing efforts in recent decades to improve health literacy among various patient populations. Previous studies have shown that the American public is most aware of tobacco as a risk factor for head and neck cancer and marginally aware of other risk factors<sup>2</sup>. We aimed to identify the level of knowledge of the general otolaryngology clinic population at a tertiary academic medical center. Our patients had a moderately high awareness of cigarettes (83.7%) and chewing tobacco (77.5%) as risk factors for HNC. In an online survey of the adult American public by Luryi et al, only 54.5% and 32.7% of adults correctly identified smoking cigarettes and chewing tobacco as risk factors for HNC, respectively<sup>2</sup>. The increased awareness of the carcinogenic nature of tobacco observed in our population could be attributed to a general increased health literacy in patients presenting to a specialty clinic or to increased media representation of the harmful effects of tobacco in recent years. Our non-cancer patient population more often correctly identified chewing tobacco as a risk factor for HNC compared to our cancer patients (78.9% vs 68.1%). Chewing tobacco is not as common in the northeast as compared to the Midwest United States<sup>9</sup>. Our patients were decently informed of the carcinogenic effects of chewing tobacco despite the low prevalence of this practice in our geographic location.

Drinking three or more alcoholic beverages a day increases a person's risk of developing head and neck cancer<sup>10</sup>. This risk is further intensified in patients who smoke tobacco and drink alcohol due to alcohol's potential solvent properties<sup>10</sup>. We have observed a lack of awareness especially among newly diagnosed head and neck cancer patients of the carcinogenic effects of alcohol. This was our driving force to pursue this study and bring attention to this knowledge gap. Our patients had mildly increased knowledge of alcohol as a risk factor for HNC (29.0%) compared to the general population as surveyed by Luryi et al (4.8%)<sup>2</sup>. Previous studies at cancer screening events have shown similar results to ours, with 39.5% of patients identifying alcohol as a risk factor<sup>4</sup>. Our cancer patients were more knowledgeable of alcohol as a risk factor (40.6%) compared to our non-cancer patients (27.2%). However, the awareness level is too low to consider our cancer cohort or general otolaryngology population well informed. Our faculty and house staff have made efforts to educate newly diagnosed cancer patients of the carcinogenic effects of alcohol. As evidenced from this study, more work is needed in addition to expanding our education efforts to the remainder of our clinic population. Overall, the American public and otolaryngology patient population knowledge of alcohol as a risk factor for HNC is poor.

With the rise in Human Papilloma Virus (HPV) related cancers of the head and neck, public awareness of this viral risk factor has increased but is still only at 12 - 28%<sup>2-4</sup>. Oral sex, increased number of sexual partners, and early age at first sexual encounter are associated with an increased risk of HNC<sup>11</sup>. Similar to previous studies, only 21.8% of our patients identified oral sex as a risk factor for HNC. Public awareness

of HPV is increasing, but it's relation to head and neck cancer is still largely unknown by the general ENT population. Our cancer population was slightly more informed than the general ENT population (33.3% vs 20%). Sexual behaviors and their risk of HPV transmission is always a topic of education for our newly diagnosed HPV positive cancers patients.

It is not unexpected that the remainder of the risk factors for HNC were not commonly known by our patients. Increased risk of HNC with long term frequent use of mouthwash is thought to be related to the alcohol content<sup>12</sup>. Poor oral hygiene and infrequent teeth brushing has repeatedly been shown to elevate the risk of HNC<sup>13</sup>. Betel quid has been associated with HNC regardless of whether tobacco is added to the mixture<sup>14</sup>. Knowledge of these risk factors and their relation to head and neck cancer has not been well studied in the American public.

This study is the first to explore the general otolaryngology clinic patient population knowledge of head and neck cancer. We hypothesized that general otolaryngology patients would have improved knowledge compared to the general public. Our patients did show increased knowledge of the carcinogenic risk of smoking cigarettes and chewing tobacco compared to the general population as surveyed by Luryi. Our patients had improved, but still unsatisfactory, knowledge of alcohol as a risk factor for HNC. Our study brings attention to the need for patient education of the risk factors for head and neck cancer especially alcohol – a modifiable risk factor. Patients with a history of head and neck cancer are mildly more informed of the risk factors for HNC likely due to our physician to patient educational efforts, but there is still much needed improvement in this population as well.

Limitations of this study include single academic institution and localized geographic location. Albany county has a small Hispanic population (6%) compared to the United States as a whole (18%).<sup>8</sup> However, as a tertiary referral center, we have a wide service area including 25 counties in New York, Vermont, and Massachusetts. Collecting sociodemographic information would have added to our study's generalizability. Our future efforts will be aimed at improving knowledge of all otolaryngology patients through increased physician to patient efforts and educational campaigns.

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**FIGURE LEGEND:**

Figure 1: Patient Survey

Table 1: Prior History of Head and Neck Cancer

Table 2: Reason for Clinic Visit

Table 3: Survey Answers Risk Factors for Head and Neck Cancer

#### Patient Survey on Risk Factors for Head and Neck (Mouth/Throat/Voice box) Cancer

I have not taken this survey before

If you have taken this survey before, please do not repeat the survey.

Survey #:

Please put a check in the boxes to show which factors you believe have been scientifically proven to contribute to Mouth/Throat/Voice box Cancer (note that not all of the choices below contribute to cancer):

Microwaved Plastic

Not brushing your teeth

Smoking Marijuana

Artificial Sweeteners

Chewing Tobacco

Kissing

Cocaine

Oral sex

Smoking cigarettes

Heroin

Methamphetamines

Alcoholic Drinks

Eating spicy food

Acid reflux

Salty foods

Chewing betel quid

Mouth wash

Electronic Cigarettes

Eating Marijuana

Have you been diagnosed with cancer of the mouth, throat, or voice box? Circle: Yes or No

Place a checkmark next to the reason for your visit today:  Ear  Nose  Voice

Fracture  Non-cancerous mouth/throat issue  Cancer

#### Hosted file

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