Smoking, Carcinophobia and Voice Handicap Index

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Key Words
Smoking · Carcinophobia · Voice Handicap Index

Abstract
Objective: This study focuses on the relation of smoking, carcinophobia and voice handicap in dysphonic patients. Patients and Methods: Fifty-four German-speaking outpatients voice clinic attendees suffering from dysphonia of benign origin took part in this study. All patients completed the German version of the Voice Handicap Index (VHI) and were asked about their fear of suffering from laryngeal cancer without prior information about their diagnosis. Results: Smokers did not fear to suffer from laryngeal cancer more than nonsmokers. However, former smokers were slightly more often found to be carcinophobic than nonsmokers. There was neither a significant difference in VHI scores comparing smokers to non- and former smokers nor when comparing carcinophobic to noncarcinophobic patients. Conclusion: Smoking may cause laryngeal cancer and influence the voice but does not affect patients’ handicap due to dysphonia as measured by the VHI. Smoking habits do not influence the development of carcinophobia and carcinophobic dysphonic patients do not experience their voice problem differently than dysphonic patients without carcinophobia as measured by the VHI.

Introduction
Not only since cigarette packs in the European Union (EU) have to be labeled “Tobacco seriously damages health” [1] do we know that smoking is injurious to health. Every year, half a million of people in the European Union die from the effects of smoking, thus making tobacco use one of the most frequent causes of death and the most important single avoidable cause of death overall [2]. Tobacco use also remains the single most preventable cause of death in the USA. Every year, more than 440,000 Americans die from tobacco-related diseases, with heart disease, stroke and other cardiovascular diseases accounting for more than one third of these deaths [3]. However, smoking is not only a risk factor for cardiovascular diseases. It is also one of the major risk factors for the development of different kinds of cancer of the upper and lower respiratory tracts [4, 5], laryngeal cancer being the secondary most frequent tumor of the respiratory tract worldwide [5] and accounting for approximately 1,500 deaths in Germany every year [6].

A US-wide survey by the American Cancer Society recently showed that for the majority of smokers the fear of cancer is the major reason to quit smoking [7]. However, the fear of cancer, i.e. carcinophobia or cancerophobia [8, 9], is not something only smokers have. Dysphonic patients often only consult a physician because they are afraid that this might be the first symptom of laryngeal cancer.
This study examines whether or not dysphonic smokers are more likely to develop carcinophobia than dysphonic nonsmokers. It also investigates whether or not carcinophobia influences the patients’ score on a self-report questionnaire, i.e. the Voice Handicap Index (VHI).

**Participants and Methods**

Fifty-four German-speaking dysphonic patients consecutively presenting to the reporting department between 08/10/2004 and 09/16/2004 took part in this study after informed consent. Complete data sets were obtained from 30 women and 24 men aged 48.5 ± 15.8 years with no significant age differences between the female and the male subgroups. Patients with malignancies of any kind were excluded from the study.

All patients underwent structural assessment at rigid laryngoscopy and stroboscopy carried out by an experienced otolaryngologist and phoniatrician. A functional voice disorder was found in 13 women and 10 men, whereas 17 women and 14 men suffered from an organic voice disorder (unilateral vocal cord paralysis, n = 12; benign neoplasms, n = 10; chronic laryngitis, n = 6; others, n = 3).

The patients were asked to complete the German version of the VHI [10–12] before the examination. All of them returned fully completed questionnaires. The patients were also asked about their smoking habits and whether one major reason for them coming to see a laryngologist was their fear of having cancer.

The patients were divided into 2 groups, i.e. into carcinophobic and noncarcinophobic subjects and the following subgroups: current smokers, nonsmokers who had smoked in the past but not within the previous 6 months (‘former smokers’) and nonsmokers who had never smoked (‘nonsmokers’). The subgroups were compared using MatLab® software.

**Results**

Of the 54 examined patients, 30 had never smoked, 12 were current smokers and 12 were former smokers.

Carcinophobia was found in 8 nonsmokers (27%), 5 current smokers (42%) and 8 former smokers (67%). Concerning carcinophobia, there was no significant difference between nonsmokers and current smokers [p > 0.05; 2-sided χ² test with Yates’ adjustment; odds ratio (OR) = 1.96, confidence interval (CI) = 0.39–9.99] nor between nonsmokers and current plus former smokers (p > 0.05; 2-sided χ² test with Yates’ adjustment; OR = 3.25, CI = 0.91–12.02). The prevalence of carcinophobia did not differ significantly when comparing former with current smokers (p > 0.05; 2-sided χ² test with Yates’ adjustment; OR = 0.36, CI = 0.05–2.48). Former smokers were significantly more often found carcinophobic than nonsmokers (p = 0.04; 2-sided χ² test with Yates’ adjustment; OR = 5.50, CI = 1.07–30.68).

Table 1 shows the VHI scores for the carcinophobic and noncarcinophobic patients. The noncarcinophobic patients scored worse (!) than the carcinophobic ones in both the VHI total score and the VHI subscales, but not on a significant level (p > 0.05; 2-sided χ² test with Yates’ adjustment).

Table 2 shows the VHI scores for the nonsmokers, current smokers, former smokers and current plus former smokers in general.

**Table 1. VHI scores for carcinophobic and noncarcinophobic patients**

<table>
<thead>
<tr>
<th></th>
<th>Noncarcinophobic (33 of 54 patients)</th>
<th>Carcinophobic (21 of 54 patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>51.8 ± 27.8</td>
<td>37.2 ± 24.6</td>
</tr>
<tr>
<td>Emotional</td>
<td>16.2 ± 10.8</td>
<td>11.4 ± 8.9</td>
</tr>
<tr>
<td>Physical</td>
<td>19.7 ± 8.8</td>
<td>15.3 ± 7.6</td>
</tr>
<tr>
<td>Functional</td>
<td>15.9 ± 10.8</td>
<td>10.4 ± 9.5</td>
</tr>
</tbody>
</table>

Values are means ± SD. A higher score indicates a greater voice handicap.

**Table 2. VHI scores for different patient groups based on smoking habits**

<table>
<thead>
<tr>
<th></th>
<th>Nonsmokers (30 patients)</th>
<th>Smokers in general (24 patients)</th>
<th>Current smokers (12 patients)</th>
<th>Former smokers (12 patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>47.3 ± 28.4</td>
<td>44.6 ± 26.4</td>
<td>49.7 ± 22.8</td>
<td>39.5 ± 29.6</td>
</tr>
<tr>
<td>Emotional</td>
<td>14.4 ± 10.9</td>
<td>14.2 ± 9.8</td>
<td>16.2 ± 10.0</td>
<td>12.3 ± 9.5</td>
</tr>
<tr>
<td>Physical</td>
<td>18.2 ± 8.6</td>
<td>17.8 ± 8.6</td>
<td>20.3 ± 7.1</td>
<td>15.3 ± 9.6</td>
</tr>
<tr>
<td>Functional</td>
<td>14.7 ± 11.2</td>
<td>12.6 ± 9.8</td>
<td>13.3 ± 8.6</td>
<td>11.9 ± 11.3</td>
</tr>
</tbody>
</table>

Values are means ± SD. A higher score indicates a greater voice handicap.
smokers. The current smokers scored slightly worse than any of the other groups in the total and all VHI subscales except for the functional one. There was no significant difference in any of the VHI scores comparing nonsmokers to smokers in general, nonsmokers to current or former smokers and current to former smokers (p > 0.05; 2-sided χ² test with Yates’ adjustment).

**Discussion**

The participants in this study match the characteristics (age, gender, diagnosis) of the long-term average of the patients presenting at the reporting department. Therefore, the study results may be deemed representative of all patients of the reporting department and of similar highly specialized institutions [10–15]. In many other international studies patients are enrolled similarly, resulting in a good comparability of study findings [12, 13, 16, 17].

Considering that there is no standard measure for the assessment of carcinophobia in ENT patients, the participants were simply asked about their fear of suffering from laryngeal cancer. All patients completed the German version of the VHI, which has proven to be a valid, reliable and sensitive tool for the assessment of patients’ perception of their voice problem [10–12, 14, 17–22], and it is also recommended for clinical routine by the European Laryngeal Society [23]. The participants in this study achieved VHI scores ‘typical’ of dysphonic patients [10–12].

Roughly one fourth of all Germans (23.2%) smoke, most of them regularly [24]. Likewise, in this study, 22.2% of all patients were smokers and were assumed to be worried that their voice problem might be associated with laryngeal cancer. Still, only comparing nonsmokers and former smokers revealed a significantly different number of carcinophobic patients. Maybe the other subgroups were too small to reach significant differences. In order to reach significantly different results in all subgroups, however, the study population would have to be increased at least 6-fold. So, if only a number of more than 300 patients had to be recruited to answer a ‘simple’ question like the one of this study, the clinical relevance of the data would have to be questioned and considered as only of minor interest.

The fear of developing cancer may be the number one reason why people try to quit smoking [7], but it does not account for all patients, maybe due to personality factors. A thorough exploration of personality factors, however, is far beyond the focus of this study; and these factors cannot be assessed in clinical routine, at least in the ENT field.

Nevertheless, psychological factors do not only influence the course and development of different diseases but also the way people experience themselves and their state of health [9, 25–28]. So, the possibility of having cancer and subsequent carcinophobia were expected to influence the VHI results. However, carcinophobic patients did not score worse on the VHI than noncarcinophobic ones. They even had (insignificantly) lower scores on the total scale and all subscales, indicating a lesser handicap. This is in accordance with a study by Billante et al. [21], which showed that even patients with cancer-related unilateral vocal fold paralysis did not score significantly worse on the VHI than patients with paralysis of benign etiology. Also, patients who are later diagnosed as having cancer of the larynx have been found to play down their symptoms and deny any fear of cancer [29]. Further work will focus on whether strong fears like carcinophobia and other states of mental distress influence the scores on more general health measures such as the Short Version of the Giessen Subjective Complaints List [30] or the Short Form 36 Health Survey Questionnaire [31].

The effects of smoking on the larynx and thus on the voice are well known and include changes in fundamental frequency [32, 33], frequency perturbation parameters and vocal tremor parameters when comparing healthy smokers to nonsmokers [34]. However, voice disorder itself and voice handicap focus on different aspects. So, as could be expected, smokers did not score significantly differently on any of the VHI scales than nonsmokers, indicating that smoking does not influence voice handicap. Although smokers might have a poorer quality of life due to smoking-associated disease, this cannot be reflected in a voice-specific handicap measure such as the VHI. Like the Voice-Related Quality of Life measure, the VHI is a disease-specific questionnaire and cannot replace a general health survey [31, 35].
References


