In their article on differences in the sex ratios for incidence rates for two anatomic subsites for laryngeal cancer, Yang et al. [1] discuss differences in the anatomy and physiology of the vocal cords related to gender. Their discussion on the differences in frequency of vibration may be extended by considering that many carcinogens may reach the vocal cords in conjunction with particular matter. The higher frequency of vibration of the cords in females may result in greater dispersion of these particles off the cords and onto the non-vibrating surrounding supraglottic areas. Also the vocal cords of the female are thought by some observers to be engaged in vibration over a larger percent of the time (this may be only a popular myth but merits discussion). This dispersion of particles would reduce the number of particles remaining on the cords in females and would increase the number of particles reaching the supraglottic region. This change in distribution of carcinogens would tend to reduce the incidence of glottic cancer in females and increase the incidence of supraglottic cancer in females thus contributing in two ways to affect the sex rate ratios in the direction observed by Yang et al.

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REFERENCE

SEX RATIO OF LARYNGEAL CANCER BY ANATOMICAL SITE

Yang et al. [1], on the basis of incidence data from nine population-based cancer registries participating in the Surveillance, Epidemiology and End Results (SEER) program, report a male to female rate ratio for laryngeal cancer substantially higher in the glottic region (9.2 for whites, 11.8 for blacks) than in other subsites (between 3 and 5 in both races).

Since both the glottis and supraglottis are in direct contact with the two major recognized risk factors for laryngeal cancer—alcohol and tobacco [2]—they suggested that differential exposure to alcohol and tobacco cannot by itself explain the higher sex ratio for the glottic region, and that hormonal or other sex-related factors should be considered.

Since replications of findings in different populations is an important requisite in the process of epidemiological inference, we report here comparable data from the Cancer Registry of the Canton of Vaud, covering a population of 530,000 inhabitants in 1980 from an area of relatively high laryngeal cancer rates, in comparison with other Western European regions [3, 4].

Between 1974 and 1987, a total of 336 cases of squamous cell laryngeal carcinomas were reported in males and 31 in females, corresponding to rates of 6.8 and 0.5/100,000 (world standard) respectively, and an overall sex ratio of 12.6. No appreciable difference in sex ratio according to subsite was observed. The sex ratio was 16.7 for glottis (ICD-9: 161.0), 15.1 for supraglottis (ICD-9: 161.1), and 12/12 cases of subglottis (ICD-9:161.2) were registered in males (Table 1).

The male/female rate ratio for glottis vs supraglottis, adjusted for age in decades was 1.0, with 95% confidence interval of 0.3–2.7. Thus, we could exclude in this dataset a threefold excess of glottic as compared to supraglottic cancer.

These findings show a substantially larger sex ratio for all squamous cell carcinomas of the
Table 1. Age-standardized (world) incidence rates and sex ratios (male/female) of squamous cell carcinoma of the larynx by subsite and sex. Vaud Cancer Registry, Switzerland, 1974–1987

<table>
<thead>
<tr>
<th>Subsite</th>
<th>Incidence rate/100,000 for:</th>
<th>Males</th>
<th>Females</th>
<th>M/F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glottis</td>
<td></td>
<td>2.67 (134)*</td>
<td>0.16 (10)</td>
<td>16.7</td>
</tr>
<tr>
<td>Supraglottis</td>
<td></td>
<td>2.11 (102)</td>
<td>0.14 (8)</td>
<td>15.1</td>
</tr>
<tr>
<td>Subglottis</td>
<td></td>
<td>0.24 (12)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Laryngeal cartilage</td>
<td></td>
<td>0.16 (8)</td>
<td>0.06 (3)</td>
<td>2.7</td>
</tr>
<tr>
<td>Other &amp; Nos</td>
<td></td>
<td>1.64 (80)</td>
<td>0.17 (10)</td>
<td>9.6</td>
</tr>
<tr>
<td>Total, all sites</td>
<td></td>
<td>6.82 (336)</td>
<td>0.54 (31)</td>
<td>12.6</td>
</tr>
</tbody>
</table>

*Number of cases is given in parentheses.

The incidence rates of squamous cell carcinoma of the larynx as compared with the American series (overall sex ratio, 5.8 for whites, 6.7 for blacks). Further, they are not compatible with the 2.7 to 3.3 excess of glottic cancer in males observed in the SEER study. A relevant difference between the two datasets is given by the larger sex ratio for all tobacco and alcohol/tobacco-related cancers (besides larynx, lung, oral cavity and oesophagus with sex ratios of approximately 10) in the Swiss population [5] as compared with the American one [6]. A sex ratio comparable with that of lung and other tobacco-related cancers is observed in this population both for supraglottic and glottic cancers, indicating that in this population no other sex-related factor is required to explain sex differentials in the glottic region.

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REFERENCES


Response

We appreciate the two Letters to the Editors by Dr DeWys and by Dr Levi et al. in response to our recently published article [1].

In an effort to extend our hypothesis, Dr DeWys further proposed that the higher frequency of vocal cord vibration in females may result in greater dispersion of inhaled carcinogens. Indeed, there is evidence to suggest that mucociliary clearance is substantially faster in females than in males [2, 3]. It remains to be determined whether such a difference might be related to the higher sex rate ratio of glottic than supraglottic tumors observed in our study.

Levi et al. discussed their data from the Vaud Cancer Registry in Switzerland. The sex rate ratios in their series were similar between glottic tumors and supraglottic tumors (16.7 vs 14.2 respectively). However, the sample size in their study is small, particularly so in female supraglottic tumors where they reported 8 cases compared to 558 in white women in our series. A test for homogeneity in the sex ratio distribution in whites for the two subsites between our study and that of Levi et al. did not reveal strong evidence of a discrepancy ($p = 0.052$). The upper limit of the confidence interval of the sex rate ratio for glottic vs supraglottic tumors (2.7) reported in Levi’s series did not exclude the corresponding ratio in whites in our study (2.7). These statistics indicate that the results from the two studies are not necessarily in disagreement.