OCCUPATIONAL NOISE EXPOSURE AND WORK ACCIDENTS IN A BRAZILIAN CITY

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Introduction

Work accidents (WA) pose a major threat to workers’ health and constitute a major public health problem. Studies have shown that the risk of accidents is increased among workers exposed to occupational noise.

The purpose of this study was to determine whether occupational noise exposure represented a major risk factor for WA in Piracicaba, an industrialized municipality located in the interior of São Paulo state, Brazil.

Method

This hospital-based case-control study was conducted in Piracicaba, a city of 345,000 inhabitants located in the state of São Paulo, Brazil. Study cases included 600 workers aged between 15 and 60 years of age who were seen at the Emergency Unit of a Public Hospital due to typical WA. A total of 822 workers (15-60 years of age) who were either seen for reasons other than WA or were accompanying other patients, were used as controls. Consent was obtained from all study participants.

Univariate logistic regression models were adjusted using work occurrence as the dichotomous response variable (cases=1; controls=0). Predictive variables included the occupational and non-occupational variables included in the protocol.

Later, a multiple logistic regression model was adjusted using work occurrence as the dichotomous response variable, and the variables yielding odds ratio (OR) estimates with p≤0.25 in univariate models as predictive variables.

Results

Of all the variables investigated (gender, age, schooling years, type of work, work shift, daily working hours, mean overtime hours, large occupation group, noise exposure information, auditory complaints), those included in the final logistic regression model are shown in Table 1 along with their OR estimates, confidence intervals and significance levels.

<table>
<thead>
<tr>
<th>Variable</th>
<th>β parameter estimate</th>
<th>p value</th>
<th>OR estimate (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-reported intermediate occupational noise level</td>
<td>0.3158</td>
<td>0.0113</td>
<td>1.371 (1.074-1.751)</td>
</tr>
<tr>
<td>Self-reported high occupational noise level</td>
<td>0.6431</td>
<td>0.0003</td>
<td>1.902 (1.339-2.703)</td>
</tr>
<tr>
<td>Maintenance</td>
<td>0.7659</td>
<td>0.0031</td>
<td>2.151 (1.294-3.575)</td>
</tr>
<tr>
<td>Blue-collar workers</td>
<td>0.8430</td>
<td>&lt;0.0001</td>
<td>2.323 (1.630-3.311)</td>
</tr>
<tr>
<td>Service providers</td>
<td>0.4484</td>
<td>0.0226</td>
<td>1.566 (1.065-2.302)</td>
</tr>
<tr>
<td>Schooling</td>
<td>-0.0814</td>
<td>&lt;0.0001</td>
<td>0.922 (0.889-0.956)</td>
</tr>
</tbody>
</table>

χ² Likelihood ratio = 92.1435, 6 degrees of freedom, p=0.0001

Discussion

Multiple logistic analysis showed that the variables “self-reported intermediate occupational noise level” and “self-reported high occupational noise level” were identified as risk factors for WA, with adjusted OR estimates of 1.371 (p=0.0113; 95% CI 1.074-1.751) and 1.902 (p=0.0003; 95% CI 1.339-2.703), respectively.

The probability of WA occurrence was not homogeneously distributed among different workers doing different jobs at different occupations. Noisy work environments may pose accident risks other than noise. For multiple logistic analysis, risk estimates were controlled for schooling and large occupation groups, among other variables.

OR estimates herein obtained are consistent with those reported in the literature for the association between occupational noise exposure and WA. The investigation of such association shows that occupational noise imposes, on the worker, difficulties in communication, maintenance of attention and concentration, memory problems, as well as stress and excessive fatigue. These factors are known to be involved in the genesis of WA. Thus, the causal action of noise on work accidents calls for prevention.

Conclusion

The results obtained support investments in hearing conservation programs aiming at maintaining auditory health and reducing work accidents.

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