Exposure to Secondhand Smoke in Baltimore Bars

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Background: Despite the large evidence showing that smoking causes death and disease among people who involuntarily inhale secondhand smoke, smoke-free workplace regulations vary across cities and states in the US. In Maryland, workplaces such as bars and nightclubs have been excluded from smoke-free policies. This exclusion places patrons and employees of these establishments at an unacceptable health risk.

Objective: The objective of this study was to assess exposure to secondhand tobacco smoke among Baltimore bar employees. Exposure to secondhand tobacco smoke was assessed by measuring nicotine concentrations in the air of the bars and in the hair of the employees. This study conducted by the Institute of Global Tobacco Control and the Department of Environmental Health Sciences at the Johns Hopkins Bloomberg School of Public Health is part of a multi-country study being conducted in more than 20 countries worldwide.

Methods: The study selected 10 bars and up to 4 non-smoking employees per bar in the City of Baltimore during January and February 2007. Bars were recruited in neighborhoods throughout Baltimore City. Airborne concentration of nicotine ($\mu g/m^3$) inside bars was estimated using small passive air samplers. Employee personal exposure to secondhand smoke was estimated by measuring nicotine concentration in hair (ng/mg). Hair nicotine concentrations reflect internal exposure to secondhand smoke over the previous 3 months. Permission to place the air samples and to collect hair samples was obtained from the bar owners and employees, respectively.

Laboratory analysis of air and hair nicotine concentration was conducted at the Exposure Assessment Facility / Center for Urban Health at the Johns Hopkins Bloomberg School of Public Health. The study was approved by the institutional review board of the Johns Hopkins Bloomberg School of Public Health.

Initial results: As of Feb 22, 2007, the study protocol has been completed for a total of 5 bars and 12 employees. One of the 5 bars was a voluntary smoke-free establishment. In the remaining 4 bars, smoking was allowed. Air nicotine was detected in all the bars where smoking was allowed (range 2.1 to 16.9 $\mu g/m^3$). In the smoke-free bar, air nicotine concentrations were much lower (range 0.11 to 0.15 $\mu g/m^3$) and close to the limit of detection. In non-smoking employees working in bars where smoking was allowed, hair nicotine ranged from 0.7 to 6.1 ng/mg, documenting that workers in smoking bars are personally exposed to tobacco smoke by others. In the smoke-free bar, hair nicotine concentrations were below the limit of detection, documenting that smoke-free bars can provide complete protection to employees from exposure to secondhand smoke.

Table. Exposure to secondhand smoke in Baltimore bars

	Air nicotine ($\mu g/m^3$)	Hair nicotine (ng/mg)	Workers self-reported exposure at work (hours)
Smoking allowed	2.1 to 16.9	0.7 to 6.1	6 to 12
Smoke-free	0.11 to 0.15	<LD	0

Numbers in tables are range of values. LD: Detection limit

Conclusions: In Baltimore City, most bar employees are continuously exposed to secondhand smoke in their workplace. Sufficient evidence has shown that there is no safe level of exposure to secondhand smoke. Moreover, continuous exposure at the concentrations found in this study poses serious health risks, including cancer and cardiovascular disease. To achieve complete protection for all workers and patrons in Baltimore, MD, smoke-free initiatives in all occupational settings are required.

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