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Nicotine and Carcinogen Exposure after Water Pipe Smoking in Hookah Bars

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Abstract

Background: Water pipe tobacco smoking is spreading globally and is increasingly becoming popular in the United States, particularly among young people. Although many perceive water pipe smoking to be relatively safe, clinical experimental studies indicate significant exposures to tobacco smoke carcinogens following water pipe use. We investigated biomarkers of nicotine intake and carcinogen exposure from water pipe smoking in the naturalistic setting of hookah bars.

Methods: Fifty-five experienced water pipe users were studied before and after smoking water pipe in their customary way in a hookah bar. Urine samples were analyzed for nicotine, cotinine, the tobacco-specific nitrosamine, 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL), and mercapturic acid metabolites of volatile organic compounds (VOC).

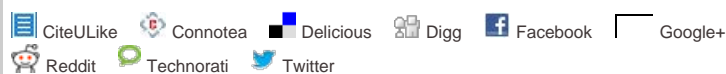
Results: We found an average 73-fold increase in nicotine, 4-fold increase in cotinine, 2-fold increase in NNAL, and 14% to 91% increase in VOC mercapturic acid metabolites immediately following water pipe smoking. We saw moderate to high correlations between changes in tobacco-specific biomarkers (nicotine, cotinine, and NNAL) and several mercapturic acid metabolites of VOCs.

Conclusion: Water pipe smoking in a hookah bar is associated with significant nicotine intake and carcinogen exposure.

Impact: Given the significant intake of nicotine and carcinogens, chronic water pipe use could place users at increased risk of cancer and other chronic diseases. *Cancer Epidemiol Biomarkers Prev*; 23(6); 1055–66. ©2014 AACR.

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