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## **Water-pipe Smoking May Not Be a Safe Alternative to Cigarette Smoking**

- Water-pipe smoking led to exposure to agents that may cause cardiovascular diseases and leukemia
- Comparison of cigarette and water-pipe smoking showed different patterns of exposure to tobacco toxicants.

PHILADELPHIA — Smoking tobacco in a water pipe resulted in a different pattern of exposure to toxic substances and may result in a cancer risk profile that is different from that of cigarette smoking, according to data published in *Cancer Epidemiology, Biomarkers & Prevention*, a journal of the American Association for Cancer Research.

“Water-pipe smoking at ‘hookah bars’ has become popular with young people in the United States, and some believe that it is less harmful than cigarette smoking,” said Peyton Jacob III, Ph.D., a University of California, San Francisco research chemist at San Francisco General Hospital and Trauma Center. “We report for the first time that toxicant exposures from water-pipe and cigarette smoking differed in pattern, with higher exposure to some toxicants like carbon monoxide and benzene in water-pipe smokers.”

To compare the levels of exposure to various tobacco toxicants, Jacob and colleagues conducted a randomized study of 13 healthy volunteers, eight men and five women. All were experienced in smoking cigarettes and using water pipes. Because different individuals excrete different amounts of toxic chemicals even if they inhale the same amounts, the most straightforward way to compare exposures was to conduct a “cross-over” study, where the same person smoked cigarettes and a water pipe on different days, according to Jacob.

Volunteers either smoked cigarettes or a water pipe exclusively during the day for four days as inpatients at the San Francisco General Hospital. After a week or more each individual was readmitted to the hospital and switched to the other product for the next four days. On average, volunteers smoked three water-pipe sessions or 11 cigarettes per day. The researchers collected blood and urine samples before, during and at the end of each type of smoking session.

The researchers found that water-pipe smoking resulted in about half the amount of total nicotine measured in the blood during a 24-hour period compared with cigarette smoking. However, exposure to nicotine, albeit at lower levels, can sustain addiction, according to Jacob. On the other hand, the researchers found that while smoking a water pipe, the total amount of carbon monoxide in the breath measured during a 24-hour period was more than 2.5 times higher than

while smoking cigarettes. Jacob explained that high carbon monoxide exposure increases the risk for acute events such as a heart attack, stroke or sudden death in people who have cardiovascular or lung diseases.

In addition, the data indicated that exposure to benzene, a volatile organic compound, was considerably higher while smoking a water pipe: The researchers detected twice the amount of a metabolite of benzene in the urine of water-pipe smokers compared with that of cigarette smokers. Jacob warned that benzene exposure is a concern because it is known to cause leukemia in humans.

“People want to know if it is a lesser health risk if they switch from cigarettes to smoking a water pipe on a daily basis,” said Jacob. “We found that water-pipe smoking is not a safe alternative to cigarette smoking, nor is it likely to be an effective harm reduction strategy.”

The researchers acknowledge that while sharing water pipes in social settings, the exposure to toxic agents may be lesser, and they are conducting further research to ascertain this.

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