

## **A comparative study of systemic carcinogen exposure in waterpipe smokers, cigarette smokers and non-smokers.**

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## **A comparative study of systemic carcinogen exposure in waterpipe smokers, cigarette smokers and non-smokers.**

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### **Source**

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### **Abstract**

#### **BACKGROUND:**

In the past decade, waterpipe smoking-also known as hookah, shisha, narghileh-has increased among youth. The scarcity of rigorous studies linking waterpipe smoking to smoking-related diseases has hindered policy and regulatory efforts to confront the waterpipe epidemic. This study compares systemic carcinogen exposure between independent groups of exclusive waterpipe smokers, cigarette smokers and non-smokers.

#### **METHODS:**

This study was conducted at the Syrian Center for Tobacco Studies (SCTS) in Aleppo, Syria, between 2010 and 2011. First morning urinary samples were collected from three groups of subjects; exclusive daily waterpipe smokers (n=24), exclusive daily cigarette smokers (n=23), and non-smokers (n=28). These samples were analysed for carcinogenic tobacco-specific nitrosamines 4-(methylnitrosamino)-1-(3-pyridyl)-1- butanol (NNAL) using liquid chromatography-tandem mass spectrometry (LC-MS/MS).

#### **RESULTS:**

Our results show that waterpipe smokers are exposed to about 5-10 times greater NNAL than non-smokers. Mean (95% CI) free and total NNAL was 0.7 (0.3 to 1.4) and 3.9 (1.6 to 9.5) pg/mL urine for non-smokers, 8.4 (4.8 to 14.8) and 33.0 (21.6 to 50.6) pg/mL urine for waterpipe smokers, and 10.7 (5.0 to 22.6) and 46.8 (27.6 to 79.3) pg/mL urine for cigarette smokers (p<0.001 for all comparisons). Daily waterpipe smokers were less exposed to NNAL than daily cigarette smokers, although the difference did not reach statistical significance for all measurements.

#### **CONCLUSIONS:**

These results provide the clearest indication to date about systemic exposure to harmful carcinogens associated with long-term waterpipe

smoking. Such evidence can support policy and regulatory efforts designed to confront the emerging global waterpipe epidemic, as well as drive interventions aimed at increasing the public awareness about the cancer risk associated with waterpipe smoking.

**KEYWORDS:**

Carcinogens, Non-cigarette tobacco products, Prevention

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