

Waterpipe Tobacco Smoke: Characterization of Toxicants and Biomarkers in a Cross-Sectional Study in Russia and Turkey

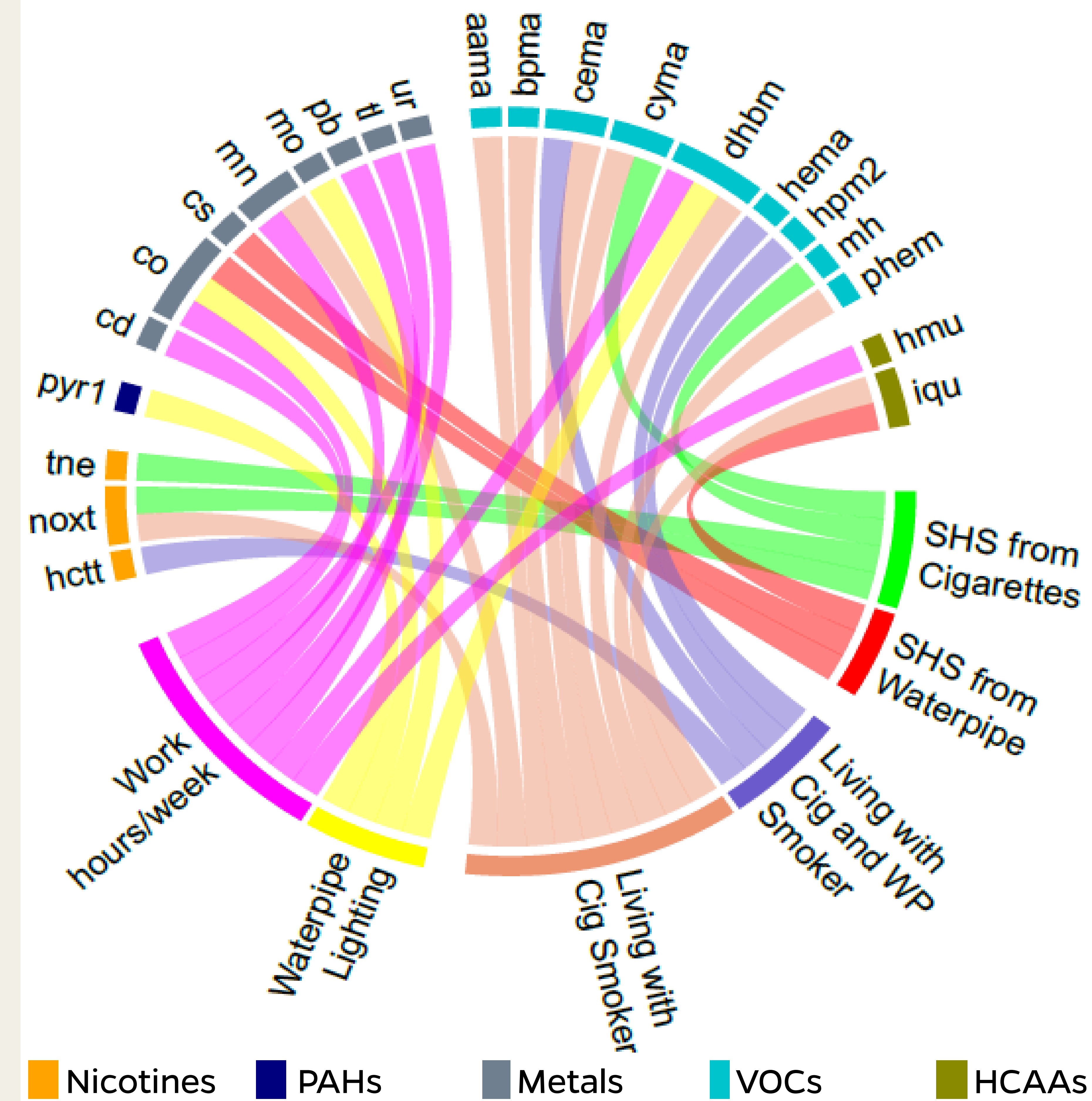
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Background

- This study investigated metals, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), nicotine metabolites (nicotines), and heterocyclic aromatic amines (HCAAs) concentrations in urine samples of waterpipe (WP) venue employees and compared their concentrations by active and secondhand WP use
- This is the first study of metals, VOCs, PAHs and HCAA, many of which are toxic and carcinogenic, among WP smokers and among those exposed to WP secondhand smoke

Methods

- In this cross-sectional study, we collected urine specimens from employees in WP venues from Turkey and Russia
- The final sample included 110 employees, with 61 in Istanbul and 49 in Moscow
- 60 chemicals were measured, including 13 metals, six nicotine metabolites, 25 VOCs, seven PAHs and six HCAAs in urine samples of employees using high performance liquid chromatography tandem mass spectrometry (HPLC-MS/MS)



Geometric Mean Ratios* (GMR) of chemicals by secondhand smoke variables

*All GMRs were adjusted by age, sex, work hours per week and country.

Results

- Employees who reported using WP had higher urinary manganese (GMR: 2.42, 95% CI: 1.16, 5.07) than never/former smokers
- High urine cobalt level was significantly associated with high work hours in WP venues, high SHS hours from WP and involved in lighting WPs
- Employees involved in lighting WPs had higher urine cobalt (GMR: 1.42, 95% CI: 1.10, 1.83), urine molybdenum (GMR: 1.43, 95% CI: 1.08, 1.90), urine 1-Hydroxypyrene (PAH) (GMR: 1.36, 95% CI: 1.01, 1.83), and urine 1-3-Butadiene (VOC) (GMR: 1.42, 95% CI: 1.06, 1.88)
- A higher number of work hours per week in a waterpipe venue was associated with higher urinary cadmium, cobalt, manganese, lead, thallium and uranium as well as with higher levels of 1-3-Butadiene (VOC) and Indole (HCAA)

Conclusions

- Being exposed to more hours of SHS in occupational and non-occupational settings and occupational involvement in lighting WP were related to excess exposure of Co as well as some PAHs and VOCs

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