

McGraw, K. E., Konkle, S. L., Riggs, D. W., Rai, S. N., DeJarnett, N., Xie, Z., ... & Bhatnagar, A. (2023). Exposure to volatile organic compounds is associated with hypertension in black adults: the Jackson heart study. *Environmental research*, 223, 115384. <https://doi.org/10.1016/j.envres.2023.115384>

Definitions

- **Volatile Organic Compounds (VOCs):** Chemicals that easily become vapors or gases, often found in pollutants.
- **Hypertension:** High blood pressure, a condition where the force of the blood against the artery walls is too high.
- **Systolic Blood Pressure (SBP):** The pressure in the arteries when the heart beats.
- **Diastolic Blood Pressure (DBP):** The pressure in the arteries when the heart is resting between beats.

Key Findings

- Exposure to volatile organic compounds (VOCs) is linked to higher blood pressure and increased risk of hypertension in Black adults.
- Both non-smokers and smokers are affected by VOCs, though the effects are more pronounced in smokers.
- Specific VOCs such as acrolein, crotonaldehyde, and styrene are particularly associated with elevated blood pressure.

Introduction

This study examines the relationship between exposure to volatile organic compounds (VOCs) and the prevalence of hypertension in Black adults. Hypertension, or high blood pressure, is a significant health issue that disproportionately affects Black individuals, leading to higher rates of cardiovascular diseases.

Main Content

Background

Hypertension is more common among Black adults compared to other ethnic groups. The study aims to understand if exposure to VOCs contributes to this health disparity. VOCs are found in urban air, vehicle emissions, industrial outputs, and household products.

Overview

The study used data from the Jackson Heart Study, focusing on 778 non-smokers and 416 smokers. Urine samples were analyzed for metabolites of 17 VOCs to measure exposure levels.

Significant VOCs and Their Effects

- **Acrolein and Crotonaldehyde:** These VOCs were associated with higher systolic blood pressure in non-smokers.

- **Styrene:** Linked to higher diastolic blood pressure in non-smokers.
- **Smokers:** Showed higher levels of several VOC metabolites, which were linked to increased systolic blood pressure and higher risk of hypertension.

Observations

- Smokers had higher systolic blood pressure and were more likely to have hypertension than non-smokers.
- The study found that VOC exposure affects blood pressure regardless of smoking status, suggesting environmental VOCs contribute significantly to hypertension.

Implications

- The study emphasizes the need for interventions to reduce VOC exposure to help manage blood pressure and reduce cardiovascular risks in Black communities.

Conclusion

Exposure to VOCs, both from environmental sources and tobacco smoke, is associated with higher blood pressure and increased risk of hypertension in Black adults. Reducing VOC exposure could be a critical step in improving cardiovascular health and addressing health disparities in Black populations. The study highlights the importance of environmental health measures and smoking cessation programs in mitigating these risks.

Word Count: 402