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Definitions

- **Volatile Organic Compounds (VOCs):** Harmful chemicals that easily become gases or vapors found in tobacco smoke.
- **Metabolites:** Substances formed when the body breaks down chemicals.
- **Electronic Nicotine Delivery Systems (ENDS):** Devices like e-cigarettes used to inhale nicotine.
- **Dual Users:** People who use both traditional cigarettes and ENDS.
- **Cardiovascular Disease (CVD):** Health problems related to the heart and blood vessels.

Key Findings

- ENDS users have lower levels of harmful VOC metabolites compared to cigarette smokers and dual users.
- Cigarette smokers and dual users have higher levels of certain VOCs, which can increase the risk of heart disease.
- Specific VOCs, like acrolein, are higher in both ENDS users and smokers compared to nonusers.

Introduction

This study explores how different types of tobacco use, including cigarette smoking and using e-cigarettes, affect levels of harmful chemicals in the body. It aims to understand the potential health risks associated with these products, especially concerning heart health.

Main Content

Background

Tobacco use, particularly cigarette smoking, is a major cause of heart disease. Both traditional cigarettes and e-cigarettes (ENDS) release VOCs, which can harm the heart and blood vessels. Understanding the levels of these chemicals in users can help assess health risks.

Methods

Researchers collected urine samples from 371 participants, including nonusers of tobacco, sole ENDS users, cigarette smokers, and dual users. They measured the levels of various VOC metabolites in the urine to compare exposure across different groups.

Results

Demographic Characteristics

- The average age of participants was 32 years, with 55% being men.
- Cigarette smokers were more likely to be Black, while ENDS users were mostly White.

VOC Metabolite Levels

- **Cigarette Smokers:** Showed the highest levels of VOC metabolites.
- **Dual Users:** Had similar VOC levels to cigarette smokers.
- **ENDS Users:** Had lower levels of most VOC metabolites compared to cigarette smokers and dual users but higher levels of certain harmful VOCs compared to nonusers.
- **Nonusers:** Had the lowest levels of VOC metabolites.

Health Implications

- Higher levels of VOCs like acrolein are linked to increased heart disease risk.
- ENDS users, while having lower overall VOC exposure than smokers, still face significant exposure to harmful chemicals.

Conclusion

The study highlights that while using e-cigarettes may reduce exposure to some harmful VOCs compared to traditional smoking, it does not eliminate the risk entirely. Both smokers and dual users have high levels of VOCs that can harm the heart. Therefore, reducing or eliminating tobacco product use is crucial for lowering health risks. This information is important for guiding public health policies and individual choices regarding tobacco use.

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