

Association of Frequency of Electronic Cigarette Use with Wheezing and Related Respiratory Symptoms in US Adults

Dongmei Li¹ and Zidian Xie¹

¹Clinical and Translational Science Institute, University of Rochester Medical Center, Rochester, NY, USA

Abstract

Background Electronic cigarette use (vaping) has been shown to significantly increase the risk of wheezing and related respiratory symptoms in adults. This study examined the association of frequency of vaping with wheezing and related respiratory symptoms in US adults.

Methods The Population Assessment of Tobacco and Health (PATH) study Wave 4 data with 33,644 adults were used. Multivariable weighted logistic regression models were used to examine the cross-sectional association of frequency of vaping with wheezing and related respiratory symptoms with consideration of the complex sampling design.

Results According to the weighted PATH Wave 4 data, about 84.1% adults never vaped, 4.6% adults vaped one time, 5.2% vaped 2-10 times, 2.2% vaped 11-20 times, 1.9% vaped 21-50 times, 0.8% vaped 51-99 times, and 1.1% vaped 100 or more times in their entire life. Compared to adults who never vaped, adults who vaped 2-10 times had significantly higher association with risk of having wheezing or whistling in the chest (aOR = 1.59, 95% CI: 1.37 to 1.85), having chest sounded wheezy during or after exercise (aOR = 1.49, 95% CI: 1.27 to 1.75), and having a dry cough at night not associated with a cold or chest infection in past 12 months (aOR = 1.26, 95% CI: 1.13 to 1.41). Higher frequency of vaping (> 10 times) had similar estimated adjusted odds ratios to 2-10 times.

Conclusion Vaping two or more times was significantly associated with wheezing and related respiratory symptoms in US adults.

Introduction

- ❖ Wheezing is a high-pitched lung sound due to narrowed or abnormal airways and is always associated with difficulty in breathing and maybe an indication of more severe disease.
- ❖ Wheezing can be caused by inflammation of the airway and previous experimental studies on human monocytic cell lines has shown that vaping is significantly associated with biological inflammatory response.
- ❖ Our previous studies found that vaping is significantly associated with wheezing and related respiratory symptoms and self-reported COPD in US adults.
- ❖ Few studies have examined the frequency of vaping with the association of wheezing and related respiratory symptoms.

Methods

- ❖ The study was conducted using the nationally representative, cross-sectional PATH Wave 4 data collected from December 2016 to January 2018 on 33644 adults (18 years and older).
- ❖ Predictor variable is vaping frequency in entire life, which has seven levels: never-users; vaping one time, even just a few puffs; vaping 2 to 10 times; vaping 11 to 20 times; vaping 21 to 50 times; vaping 51 to 99 times; vaping 100 or more times.
- ❖ Outcome variables are 1) wheezing or whistling in the chest in past 12 months; 2) chest has sounded wheezy during or after exercise in past 12 months; 3) In past 12 months, had a dry cough at night not associated with a cold or chest infection.
- ❖ Covariates include age, sex, race/ethnicity, education level, income level, BMI, self-perception of physical health, self-perception of mental health, currently lived with anyone who used tobacco, asthma, lived with a regular smoker during childhood, home smoking policies, home vaping policies, average number of cigarettes now smoked each day.
- ❖ Weighted multivariable logistic regression model were used for data analysis with the balanced repeated replication (BRR) method for variance estimation.

Results

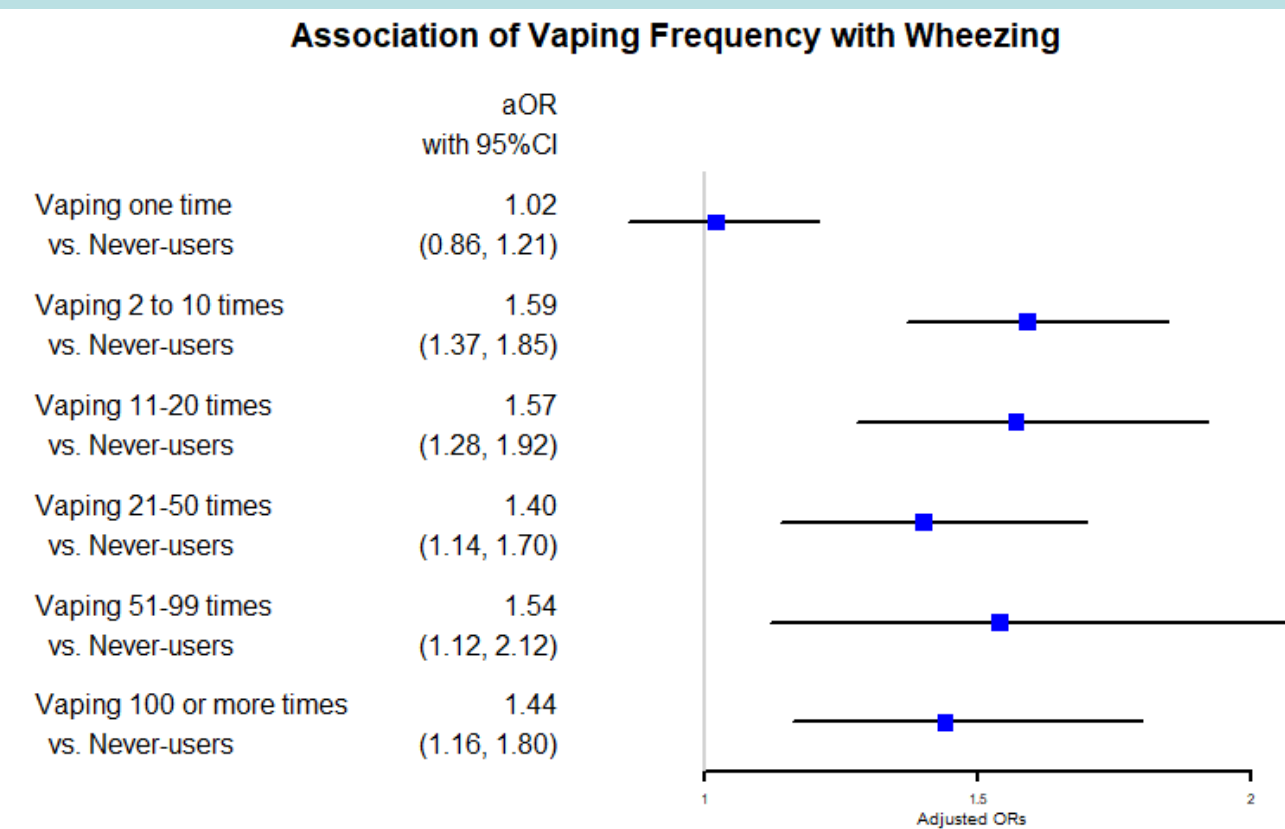


Figure 1: Adjusted odds ratio of vaping frequency with wheezing.

- ❖ Vaping two or more times was significantly associated with wheezing or whistling in the chest in past 12 months.
- ❖ Vaping one time even just a few puffs was not significantly associated with wheezing or whistling in the chest in past 12 months.
- ❖ The adjusted odds ratios were not significantly different among the vaping frequency groups with two or more vaping.

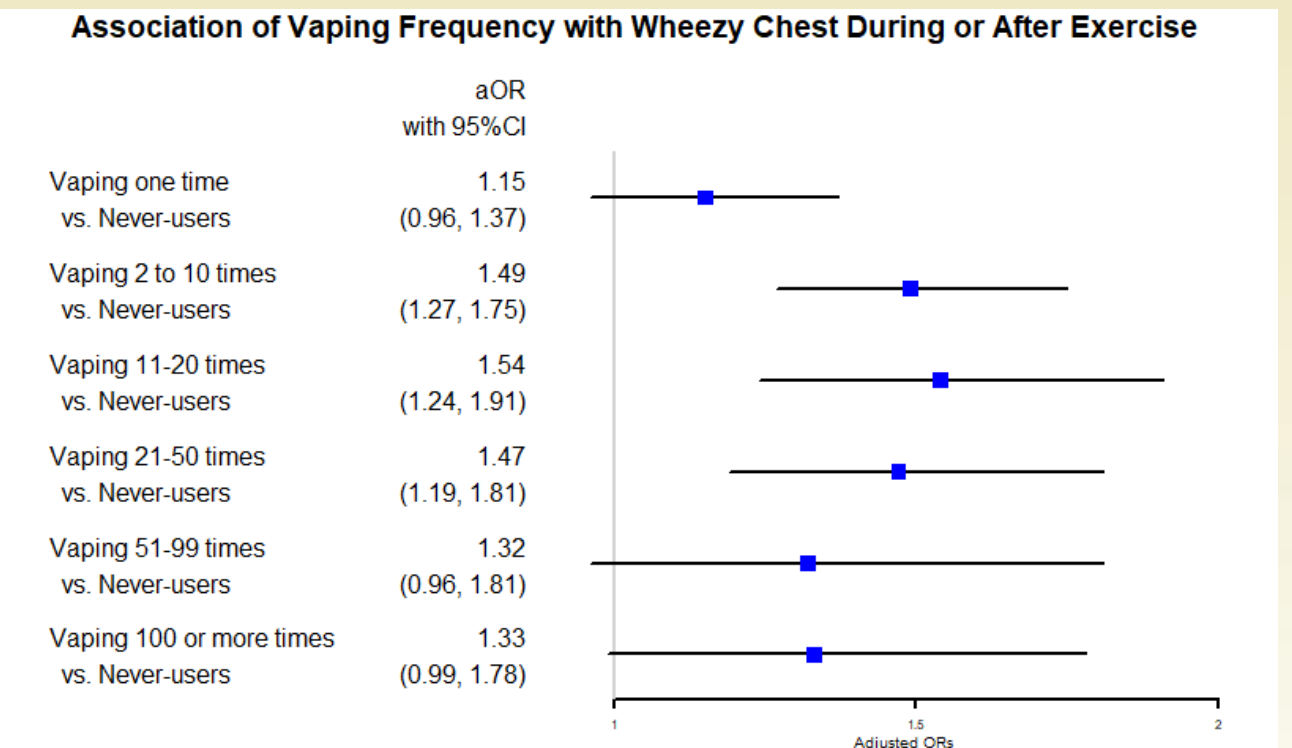


Figure 2: Adjusted odds ratio of vaping frequency with wheezy chest during or after exercise.

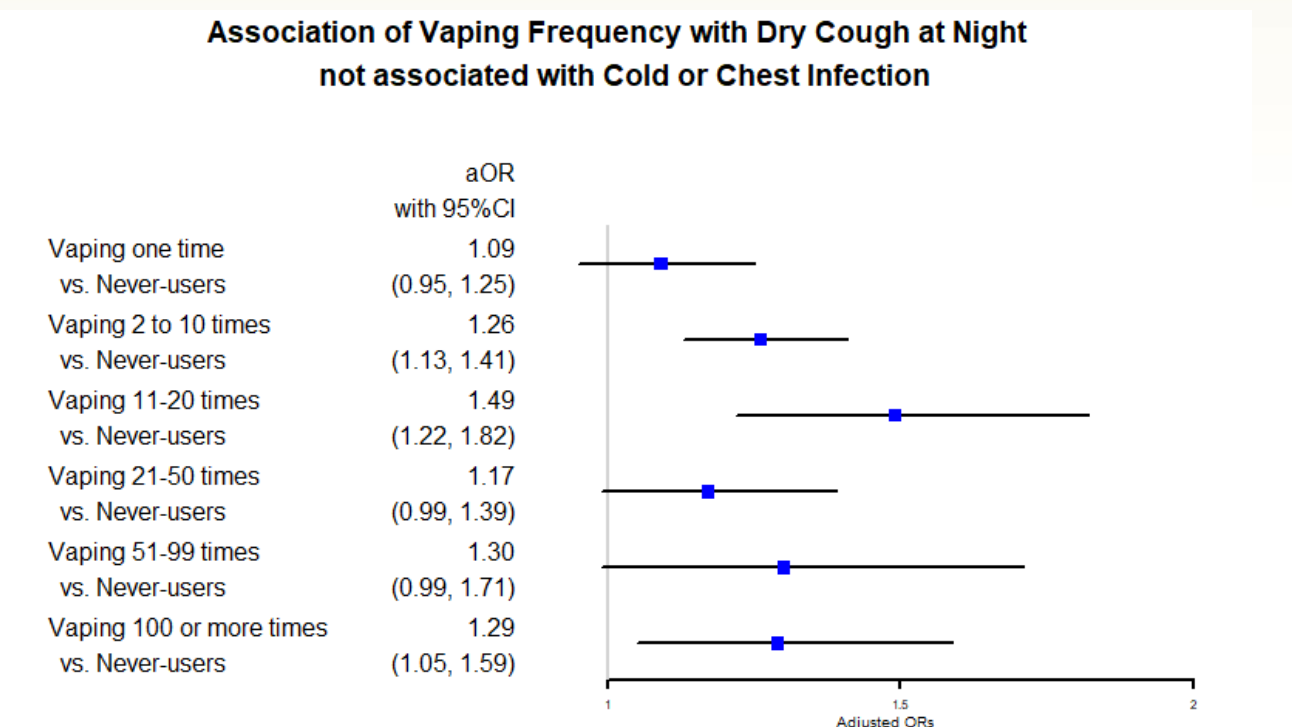


Figure 3: Adjusted odds ratio of vaping frequency with dry cough at night not associated with cold or chest infection.

- ❖ Vaping two to 50 times was significantly associated with wheezy chest during or after exercise.
- ❖ Vaping two to 20 times or 100 times or more was significantly associated with dry cough at night not associated with cold or chest infection.

Conclusions

- ❖ Vaping two or more times was associated with wheezing and related respiratory symptoms in US adults.

Acknowledgements

Research reported in this publication was supported by the National Cancer Institute of the National Institutes of Health (NIH) and the Food and Drug Administration (FDA) Center for Tobacco Products under Award Number U54CA228110. Dr. Li's time is supported in part by the University of Rochester CTSA award number UL1 TR002001 from the National Center for Advancing Translational Sciences of the National Institutes of Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the Food and Drug Administration (FDA).