



Vaping and Covid-19 risk

TOM BECKER, NORTHWEST PORTLAND AREA INDIAN HEALTH BOARD

Game plan

- ▶ Examine recent article on vaping, and vaping plus cigarette use on risk of Covid-19 symptoms, testing behavior, and positive Covid dx among young people

Objectives

- ▶ Recite key findings from Gaiha paper on vaping and Covid-19
- ▶ Recognize shortcomings of the paper and suggest alternative study designs
- ▶ Write down ways you can use the information to counsel young people about vaping risks, in the clinical setting or in public health messages in your neighborhood

Take home messages

- ▶ Covid-19 diagnosis associated with a 5-fold increase in risk among ever-users of e-cigarettes
- ▶ Covid-19 diagnosis associated with a 7-fold increase in risk among dual users of e and regular cigarettes (ever use of both)
- ▶ Covid-19 diagnosis associated with a 7-fold increase in risk among dual users in past 30 days
- ▶ Other associations with male sex, non-binary gender, Hispanic ethnicity, Higher SES, living in a state with High % of Covid-19 patients

Introduction

- ▶ Nicotine increases in ACE2 enzyme expression in lung tissue (McAliden et al)
- ▶ ACE2 expression is up-regulated in small airway epithelium of smokers, and of Covid-19 patients
- ▶ Covid-19 and lung damage progression is more likely among smokers than non-smokers
- ▶ E cigarettes enhance virulence and inflammatory profiles of other lung pathogens, like *s. pneumonia*
- ▶ Smoking alone is strong risk factor for Covid-19 progression (Chinese study)

Methods for Gaiha study, JAH 2020

- ▶ On-line survey using Qualtrics
- ▶ Participant ages 13-24 years, national sample
- ▶ Qualtrics on-line panels using website links to gaming sites, social media platforms, customer loyalty groups
- ▶ Quota sampling: investigators aimed at 50% of nicotine users, 50% non-users

Exposures and Outcomes measured

- ▶ Ever use of both vaping and regular cigarettes
- ▶ Past 30 day use
- ▶ Combinations of use
- ▶ Covid-19-sxs, testing, positive test results (i.e., Covid-19 dx)

Confounders considered

- ▶ Mother's education level as surrogate for SES
- ▶ BMI
- ▶ Compliance with shelter in place orders
- ▶ % of positives in home state with Covid
- ▶ Sex/gender
- ▶ Race

findings from study

- ▶ 4351 participants from 50 states, DC, and 3 territories
- ▶ Vaping:non-vaping about 50:50 ratio
- ▶ Multiple racial, gender groups represented (probably also from oversampling...not clear from paper)

	Participant characteristics ^a (unweighted)		
	Sample (N)	Never-users (n = 2,168)	E-cigarette users (n = 2,183)
Total	4,351	49.8	50.2
Age			
Adolescents (13–17)	1,442	50.3	49.7
Young adults (18–21)	1,810	49.3	50.7
Adults (22–24)	1,063	49.9	50.1
Sex			
Male	1,421	48.6	51.4
Female	2,832	50.4	49.6
Other ^b	71	51.5	48.5
LGBTQ			
Yes	780	43.1	56.9
No	3,566	51.3	48.7
Race/ethnicity			
White, non-Hispanic	2,611	57.5	42.5
AA/black, non-Hispanic	602	46.5	53.5
Asian/Native Hawaiian or Pacific Islander, non-Hispanic	210	30.0	70.0
Hispanic, non-AA/black	663	36.7	63.3
Other/multiracial, non-Hispanic	265	30.6	69.4

Association between COVID-19 and use of inhaled tobacco products, adjusting for sociodemographic factors, weighted

	Ever-use of inhaled tobacco and...			Past 30-day use of inhaled tobacco and...		
	COVID-19–related symptoms (n = 4,043)	COVID-19 test (n = 4,048)	COVID-19–positive diagnosis (n = 4,048)	COVID-19–related symptoms (n = 4,043)	COVID-19 test (n = 4,048)	COVID-19–positive diagnosis (n = 4,048)
	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)
Inhaled tobacco products						
Cigarettes only	1.40 (.83, 2.38)	3.94 (1.43, 10.86)	2.32 (.34, 15.86)	1.15 (.58, 2.27)	1.16 (.64, 2.12)	1.53 (.29, 8.14)
E-cigarettes only	1.18 (.80, 1.73)	3.25 (1.77, 5.94)	5.05 (1.82, 13.96)	1.43 (.84, 2.43)	2.55 (1.33, 4.87)	1.91 (.77, 4.73)
Dual use	1.36 (.90, 2.04)	3.58 (1.96, 6.54)	6.97 (1.98, 24.55)	4.69 (3.07, 7.16)	9.16 (5.43, 15.47)	6.84 (2.40, 19.55)
Never used	Ref	Ref	Ref	Ref	Ref	Ref

Limitations of study

- ▶ Similar to other self-administered surveys/cross-sectional studies
- ▶ Qualtrics on-line panels using website: gaming sites and social media lists
- ▶ Self-selected to participate (? Refusals?)
- ▶ No validation of responses (like salivary cotinine measures)
- ▶ No information on test positivity and test characteristics
- ▶ Despite controlling for multiple confounders, the investigators in this study cannot control for selection and/or information bias

Alternative study designs

- ▶ Case-control study of risk factors for Covid testing, for Covid symptoms, and for positive Covid dx, with particular focus on vaping (cases meeting the outcome definitions, and matched controls who do not meet outcome definitions)
- ▶ Cohort study on vaping (and non-vaping), with same outcomes as above...including validation of vaping with biomarkers to help establish exposures and medical records to help validate re: outcomes

Public health and other messages

- ▶ Encourage FDA to tighten regulations on e-cigarettes
- ▶ Use this info to inform communities and counsel patients

Quotable quotes

- ▶ “Covid-19 is a dress rehearsal for the next pandemic, and the next, and the one after that...the new norm.” (author of one of the articles I found)

References

- ▶ McAlden et al. Covid-19 and vaping. Euro Resp J 2020
- ▶ Gaiha et al. Association between smoking, e-cigarette use... J. Adoles Health 2020

- ▶ Grazie a Grazia Ori...lei e bene!