Original Investigation

August 2017

Association Between Initial Use of e-Cigarettes and Subsequent Cigarette Smoking Among Adolescents and Young Adults

A Systematic Review and Meta-analysis

Samir Soneji, PhD[1,2]; Jessica L. Barrington-Trimis, PhD[3]; Thomas A. Wills, PhD[4]; et al

» Author Affiliations

JAMA Pediatr. 2017;171(8):788-797. doi:10.1001/jamapediatrics.2017.1488

Key Points

Question Is there an association between e-cigarette use and cigarette smoking among adolescents and young adults?

Finding A systematic review and meta-analysis showed strong and consistent evidence of an association between initial e-cigarette use and subsequent cigarette smoking initiation, as well as between past 30-day e-cigarette use and subsequent past 30-day cigarette smoking.

Meaning To minimize the potential public health harm from e-cigarette use, the US Food and Drug Administration, as well as state and local agencies, will need to engage in effective regulatory actions to discourage youths' use of e-cigarettes and prevent the transition from e-cigarettes to other combustible tobacco products.

Abstract

Importance The public health implications of e-cigarettes depend, in part, on whether e-cigarette use affects the risk of cigarette smoking.

Objective To perform a systematic review and meta-analysis of longitudinal studies that assessed initial use of e-cigarettes and subsequent cigarette smoking.

Data Sources PubMed, EMBASE, Cochrane Library, Web of Science, the 2016 Society for Research on Nicotine and Tobacco 22nd Annual Meeting abstracts, the 2016 Society of Behavioral Medicine 37th Annual Meeting & Scientific Sessions abstracts, and the 2016 National Institutes of Health Tobacco Regulatory Science Program Conference were searched between February 7 and February 17, 2017. The search included indexed terms and text words to capture concepts associated with e-cigarettes and traditional cigarettes in articles published from database inception to the date of the search.

Study Selection Longitudinal studies reporting odds ratios for cigarette smoking initiation associated with ever use of e-cigarettes or past 30-day cigarette smoking associated with past 30-day e-cigarette use. Searches yielded 6959 unique studies, of which 9 met inclusion criteria (comprising 17 389 adolescents and young adults).

Data Extraction and Synthesis Study quality and risk of bias were assessed using the Newcastle-Ottawa Scale and the Risk of Bias in Non-randomized Studies of Interventions tool, respectively. Data and estimates were pooled using random-effects meta-analysis.

Main Outcomes and Measures Among baseline never cigarette smokers, cigarette smoking initiation between baseline and follow-up. Among baseline non–past 30-day cigarette smokers who were past 30-day e-cigarette users, past 30-day cigarette smoking at follow-up.

Results Among 17 389 adolescents and young adults, the ages ranged between 14 and 30 years at baseline, and 56.0% were female. The pooled probabilities of cigarette smoking initiation were 23.2% for baseline ever e-cigarette users and 7.2% for baseline never e-cigarette users. The pooled probabilities of past 30-day cigarette smoking at follow-up were 21.5% for baseline past 30-day e-cigarette users and 4.6% for baseline non–past 30-day e-cigarette users. Adjusting for known demographic, psychosocial, and behavioral risk factors for cigarette smoking, the pooled odds ratio for subsequent cigarette smoking initiation was 3.50 (95% CI, 2.38-5.16) for ever vs never e-cigarette users, and the pooled odds ratio for past 30-day cigarette smoking at follow-up was 4.28 (95% CI, 2.52-7.27) for past 30-day e-cigarette vs non–past 30-day e-cigarette users at baseline. A moderate level of heterogeneity was observed among studies (I^2 = 56%).

Conclusions and Relevance e-Cigarette use was associated with greater risk for subsequent cigarette smoking initiation and past 30-day cigarette smoking. Strong e-cigarette regulation could potentially curb use among youth and possibly limit the future population-level burden of cigarette smoking.