

Genetic and Environmental Contributions to Electronic and Conventional Cigarette Use in Young Adults: A Bivariate Analysis

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Electronic cigarette (e-cigarette) use continues to rise in the United States, particularly among young adults, and the use of this tobacco product has potential for the development of nicotine dependence. Future efforts preventing nicotine dependence may benefit from understanding the degree to which genetic and environmental factors influence electronic (e-cigarette) initiation. Further, it is also important to understand the degree to which liability for e-cigarette initiation is due to genetic and environmental factors shared with conventional cigarette initiation.

A sample of 346 young adult twins (70 monozygotic, 103 dizygotic pairs) ages 17– 22 (mean = 19.5 years) from the Adolescent and Young Adult Twin Study was measured for conventional- and e-cigarette initiation. Genetic and environmental influences on conventional- and e-cigarette initiation were estimated using univariate and bivariate structural equation modeling with OpenMx.

Approximately 16% of participants reported lifetime e-cigarette initiation. The prevalence of lifetime conventional cigarette use was 18%. There was a strong association between e-cigarette and conventional cigarette initiation ($r = 0.74$, $p < 0.05$).

There were significant influences due to additive genetic (A), common environmental (C) and unique environmental (E) influences for electronic cigarette initiation ($A = 0.20$, 95%CI = 0.00– 0.84; $C = 0.48$, 95%CI = 0 – 0.76; $E = 0.32$, 95% CI = 0.12 – 0.57) as well as conventional cigarette initiation ($A = 0.11$, 95% CI = 0.00 – 0.68; $C = 0.49$, 95% CI = 0.05 – 0.69; $E = 0.40$, 95% CI = 0.20 - 0.59). There was substantial overlap for additive genetic ($r_A = 0.99$), common environmental ($r_C = 0.78$) and unique environmental ($r_E = 0.55$) factors shared between e-cigarette and conventional cigarette initiation. These results provide preliminary evidence that the genetic epidemiology of e-cigarette initiation is very similar to that of conventional cigarettes.