Parental Use of Electronic Cigarettes

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Abstract

Objective: To describe parental use of electronic cigarettes (e-cigs) to better understand the safety risks posed to children.

Methods: Between June 24 and November 6, 2014, parents completed a self-administered paper survey during an office visit to 15 pediatric practices in a Midwestern practice-based research network. Attitudes towards and use of e-cigs are reported for those aware of e-cigs before the survey.

Results: Ninety-five percent (628 of 658) of respondents were aware of e-cigs. Of these, 21.0% (130 of 622) had tried e-cigs at least once, and 12.3% (77) reported e-cig use by ≥1 person in their household (4.0% exclusive e-cig use, 8.3% dual use with regular cigarettes). An additional 17.3% (109) reported regular cigarette use. Most respondents from e-cig-using homes did not think e-cigs were addictive (36.9% minimally or not addictive, 25.0% did not know). While 73.7% believed that e-liquid was very dangerous for children if they ingested it, only 31.2% believed skin contact to be very dangerous. In 36.1% of e-cig-using homes, neither childproof caps nor locks were used to prevent children's access to e-liquid. Only 15.3% reported their child's pediatrician was aware of e-cig use in the home.

Conclusions: E-cig use occurred in 1 in 8 homes, often concurrently with regular cigarettes. Many parents who used e-cigs were unaware of the potential health and safety hazards, including nicotine poisoning for children, and many did not store e-liquid safely. Pediatricians could provide education about e-cig associated safety hazards but are unaware of e-cig use in their patient's homes.

Keywords: electronic cigarettes; patient safety; practice-based research network

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What's New

Electronic-cigarettes (e-cigs) were used in 1 in 8 homes with young children, often concurrently with regular cigarettes. Many parents who use e-cigs are unaware of the potential health and safety hazards for themselves or their children, including nicotine poisoning.

EASILY AVAILABLE AND widely advertised as an alternative to regular cigarettes and a smoking cessation aid,[1] electronic cigarettes (e-cigs) are battery-powered nicotine delivery systems that are either refillable or single use devices.[2] E-cigs use e-liquid that typically contains nicotine and flavorings that are usually dissolved in propylene glycol and water, vaporized, and delivered in aerosol form (e-vapor).[3,4] In the absence of manufacturing regulations, widespread discrepancies between reported and actual concentration of nicotine in e-liquid can occur.[5,6] Since being introduced into the United States in 2007, the use of e-cigs has dramatically increased among adults as well as middle and high school students, with high levels of dual use of e-cigs and regular cigarettes.[7–14] E-cig sales were estimated at $1.7 billion in 2013 and are projected to exceed sales of conventional cigarettes by 2023.[3,15]

The health implications of e-cigs are uncertain, especially for children. E-cigs may be effective in helping parents to reduce their cigarette consumption and stop smoking,[4,16,17] thereby reducing the health risks associated with conventional cigarettes for parents and children. However, there is concern that e-cig use may perpetuate nicotine addiction in smokers who may otherwise have quit, or induce nicotine addiction in e-cig users who do not use regular cigarettes.[4,8,11,18,19] Also, the particles and toxicants produced in the e-liquid vapor, although much lower than in regular cigarettes, may pose health risks to users and bystanders.[4,20] An immediate concern for children is that the concentrated nicotine present in e-liquid can be toxic if absorbed through the skin or ingested.[21,22] US poison centers reported a dramatic increase in calls related to e-cig exposures from 1 per month in 2010 to 215 per month in 2014, mostly related to exposure of children younger than 5 years,[23] and in December of 2014, a 1-year-old child died after drinking e-liquid.[24] The objective of this study was to assess the prevalence of e-cig use in the home and to describe children's household exposure to e-cigs and e-liquid in order to better understand the health and safety risks posed to children.

METHODS

Study Population

Pediatrician members of the Washington University Pediatric and Adolescent Ambulatory Research Consortium (WU PAARC) were asked if they would permit a research assistant (RA) to recruit study participants in their practice waiting room. WU PAARC is a practice-based research network of 33 community-based pediatric practices in St Louis, Missouri, affiliated with the Washington University School of Medicine. Fifteen WU PAARC practices agreed to participate. The study was approved by the Washington University Human Research Protection Office, requiring verbal consent from a parent for study enrollment.

Participants were parents or legal guardians (here referred to as parents) with a child attending the pediatrician's office. Parents who were not proficient in English or who had already completed the survey were excluded. RAs were present at a site on weekdays, when they invited parents to participate in the study, explained participation requirements, and answered questions. RAs did not approach parents if they were immediately called to see the physician, were preoccupied with an administrative task, or were busy with another parent.

Survey Tool

The 46-item self-report questionnaire, developed by the study team, was based on the literature and informal discussion with parents and was modified after pilot testing. Questions addressed attitudes toward and use of regular and electronic cigarettes. Parents reported if they had ever used regular cigarettes or e-cigs and if they or anyone in the home currently used e-cigs or regular cigarettes. They used categorical scales to indicate their perception of the addictiveness of these products (very, moderately, minimally, not addictive, don't know), the danger of e-cig exposure for children via inhalation, skin absorption, and ingestion (very, moderately, minimally, not dangerous, don't know), and their agreement with statements about the safety of e-vapor and e-liquid (strongly agree, agree, disagree, strongly disagree, don't know).

If e-cigs were used in the home, participants selected from lists to indicate the frequency of use, where e-cigs were used and stored, and what type of e-cig product was being used (disposable or refillable; with or without nicotine). Additional questions inquired about the pediatricians' awareness of home use of e-cigs and parent's desire to receive information about e-cigs from their child's pediatrician. Those who reported personal e-cig use indicated agreement with statements regarding the reasons for use and desire to quit. Each survey took approximately 3 minutes to complete and had a Flesch-Kincaid reading level of 6.3, indicating the survey should be understandable by an average individual with a 6th grade education or higher. Demographic information was also obtained.

Statistical Analysis

Summary statistics are reported as percentages for categorical variables and mean and standard deviation (SD) for continuous variables. We used Fisher's exact test to compare characteristics of e-cig users and nonusers. For these analyses, race was dichotomized as white versus all other races; health insurance as Medicaid versus other health insurance; respondents' educational attainment as some college or higher versus less education; and family income as less than $60,000 per year versus $60,000 per year or more. A probability of $P < .05$ (2-tailed) was used to establish statistical significance. All statistical analyses were performed by STATA 12 (StataCorp, College Station, Tex).

RESULTS

Study Participants

The 15 participating WU PAARC practices were located throughout the St Louis metropolitan area (13 Missouri, 2 Illinois; 12 group practices, 3 solo practitioners). An RA was present at each site for a median of 3.8 days (range 1.5–5 days) between June 24, 2014, and November 6, 2014. During the time the RA was present, 1651 individuals had an appointment. Of these, 1155 were invited to participate: 496 were not approached by the RA, most often because they were immediately called back to see the physician. Of the 1155 invited to participate, 418 were ineligible (143 nonlegal guardian, 72 minor, 27 repeat appointment, 25 non-English speaking, and 6 pregnant women with no other children; and 145 had no appointment—eg, they were collecting a prescription). Of the 737 eligible to participate, 59 (8.0%) declined, and 678 (92.0%) completed the survey (median 33 surveys per practice; range 11 to 122).

The majority (95.4%, 628 of 658) of respondents were aware of e-cigs before the survey. Further analyses about e-cigs were restricted to these 628 participants. Data are reported as percentages, and there were few missing data. Denominators are provided if needed for clarification or if more than 5% of responses were missing. Respondents were the child's parent (78.7% mother, 21.0% father); 87.7% had at least some college education; 22.7% were African American; and 22.6% had Medicaid coverage (Table 1).

Parental Perceptions About Regular Cigarettes and E-cigs

Overall, most survey participants (78.1%) agreed regular cigarettes were very or moderately addictive (9.5% minimally/not addictive, 12.4% don't know). In contrast, most (54.3%) were unsure if e-cigs were addictive (33.8% very/moderately, 12.1% minimally/not addictive), and 36.4% were unsure whether e-cigs were a safer alternative to regular cigarettes (32.2% agreed e-cigs were safer, 31.4% disagreed) (Table 2). Parents from e-cig-using homes (n = 77) were less likely than other parents to select