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Exposure among Children to E-cigarettes and Liquid Nicotine — Alaska, 2010–2014

Introduction

E-cigarettes were first developed in 2003 and were introduced to the United States market in 2007.[1] Most e-cigarette devices (also known as vaporizers and pens) are battery powered and include a cartridge containing the nicotine liquid and a vaporization chamber that contains the electronic controls and atomizer. The heating process converts the liquid to vapor. The process is activated by inhalation through the mouthpiece (the end of the cartridge).[2] Pre-packaged cartridges vary in concentration of nicotine ranging between 0–24 mg.[2]

Although e-cigarettes comprise less than 2% of all tobacco sales, in 2014, they accounted for >40% of cigarette-related poison control calls, of which most involved children aged 5 years and younger.[3] Additionally, the number of phone calls to U.S. poison control centers related to e-cigarette use has increased from an average of one call per month in 2010 to nearly 200 calls per month in early 2014.[3] This *Bulletin* describes poison control reports for young children exposed to e-cigarettes and liquid nicotine in Alaska.

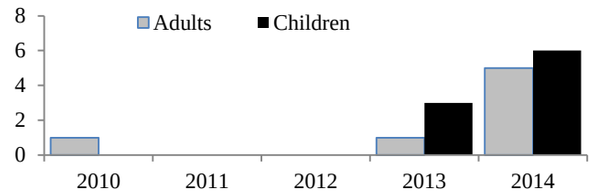
Methods

The National Poison Data System (NPDS) -- a national database of human exposures reported to participating U.S. poison control centers since 1985 -- was queried to characterize e-cigarette toxicity reports in Alaska during 2010–2014, a time period corresponding to an increase in reported use of e-cigarettes in Alaska.[4]

Results

During 2010–2014, there were 16 reports of exposure among adults and children to the contents of either an e-cigarette or refill container. Nine (56%) reports involved children, all of whom were aged <2 years. The reports involving children all occurred in 2013 (n=3) and 2014 (n=6; Figure).

Figure. E-cigarette Exposure Reports in NPDS — Alaska, 2010–2014



Overall, 56% (5/9) of the pediatric cases were managed in a health care facility and released. Medical outcomes ranged from no effect to minor effect (e.g., nausea). Most (8/9; 89%) of the children exposed had ingested the product. The most commonly noted circumstance related to exposure was improper storage of an e-cigarette or refill container such that it was easily accessible by a child.

Discussion

Although the number of e-cigarette poisoning case reports in Alaska are few, they appear to be increasing in children.[4] The reported exposure to liquid nicotine, either confirmed or suspected, underscores the importance of proper storage and disposal to assure they are not accessible by children. While most e-cigarette and liquid nicotine exposures in Alaska were among toddlers, these exposures are consistent with national patterns of e-cigarette exposures (51% among children ≤5 years and 42% among adults aged >20 years).[5]

As of 2014, there were 466 brands and 7764 unique flavors of e-cigarette products.[6] We know the use of these devices is increasing among adult Alaskans; anecdotal reports from Alaska communities are consistent with national data suggesting an increase in popularity among Alaska youth as well. Nationally, e-cigarette use among teens tripled from 4.5% in 2013 to 13.4% in 2014.[7] The more e-cigarette devices that are present in Alaska communities, the greater the risk of infant and toddler exposure to this source of poisoning.

The use of liquid nicotine around children can be hazardous. Children who ingest 0.8 mg/kg will likely develop mild symptoms (e.g., nausea and diarrhea); while symptoms of severe toxicity (e.g., seizures and respiratory failure) has been seen in children who ingest 1.4–1.9 mg/kg.[8] Since the number of uses per cartridge and concentration of nicotine liquid used varies, these inconsistencies obscure the effect of exposure to nicotine particularly when young children are exposed accidentally.

Recommendations

1. When contacting poison control (1-800-222-1222), the caller should provide the product name whenever possible. The poison control product database contains several hundred thousand products that can be cross-referenced to determine whether immediate emergency department referral is indicated.
2. Health care providers should incorporate screening and counseling about e-cigarettes during routine patient visits, to include:
    - guidance about keeping e-cigarettes and liquid nicotine out of sight and out of reach of children;
    - general patient education about e-cigarettes;
    - guidance about maintaining smoke/vapor-free air indoors, particularly in homes with children; and
    - advice on tobacco use cessation and information on assistance measures and local programs.

References

1. Consumer Advocates for Smoke-free Alternatives Association. Available at: http://casaa.org/E-cigarette_History.html
2. American Industrial Hygiene Association. White Paper: Electronic cigarettes in the indoor environment. Available at: https://www.aiha.org/government-affairs/Documents/Electronc%20Cig%20Document_Final.pdf
3. CDC. Notes from the Field: Calls to poison centers for exposures to electronic cigarettes — United States, September 2010–February 2014. *MMWR* 2014;63(13);292–93. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6313a4.htm
4. Section of Epidemiology. Adult Electronic Cigarette Use in Alaska. *Bulletin* No. 17, August 20, 2015. Available at: http://www.epi.alaska.gov/bulletins/docs/b2015_17.pdf
5. American Association of Poison Control Centers. E-cigarette devices and liquid nicotine. Available at: http://www.aapcc.org/alerts/e-cigarettes/
6. Zhu S, Sun J, Bonnevie E, et al. Four hundred and sixty brands of e-cigarettes and counting: implications for product regulation. *Tob Control* 2014;23(suppl 3):iii3-iii9.
7. CDC. Tobacco use among middle and high school students — United States, 2011–2014. *MMWR* 2015;64(14):381-85. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6414a3.htm
8. Miech RA, et al. Monitoring the Future national survey results on drug use, 1975–2014: Volume I, Secondary school students. Ann Arbor: Institute for Social Research, University of Michigan. Available at: http://monitoringthefuture.org/pubs.html#monographs
9. Alaska Division of Public Health. Tobacco-Free Alaska. E-Cigarettes: Not Harmless. Not Healthy. Available at: http://dhss.alaska.gov/dph/Chronic/Pages/Tobacco/TobaccoFreeAlaska/ecigs.aspx

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