Edible Cannabis Exposures Among Children: 2017–2019

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With legal commercialization of cannabis in a growing number of US states, increasing numbers of children have experienced unintentional cannabis exposure resulting in calls to poison control centers, health care visits, and hospitalizations. 

Edible cannabis products, which can have a high concentration of delta-9-tetrahydrocannabinol and may resemble foods that appeal to youth, have been implicated in many such exposures. In addition, edible products are often sold with multiple doses per package, meaning ingestion of large quantities is possible before effects are realized. Use of edible cannabis products has increased over time, but we lack national estimates of edible-involved pediatric cannabis exposures.

METHODS

We compared edible exposures to all other types of cannabis exposures (eg, dried plant, concentrated extracts) and examined differences by age, sex, intentionality, caller location, and medical outcomes as defined by NPDS.

We evaluated changes in exposure counts per quarter using linear regression and testing for differences in trend between edible and nonedible exposures. For 2019, we compared cases in states with legal adult cannabis use to cases in states without, including states with medical cannabis. Comparisons were assessed by using \( \chi^2 \) tests. Stata 16 software (Stata Corp, College Station, TX) was used and \( \alpha = .05 \). The Washington State University Institutional Review Board determined this study was exempt from review.

RESULTS

There were 4172 cannabis exposure cases among children aged 0 to 9 years during the study period, of which 45.7% (\( n = 1906 \)) were associated with edible cannabis products (Table 1). From 2017 to 2019, cannabis product exposures increased overall (slope coefficient \( \beta \) for quarter \( 31.6 \) [95% confidence interval [CI]: 26.0–37.3]), as did the proportion of cannabis cases that were associated with edible products (Fig 1). The increase in edible-related exposures per quarter (\( \beta = 26.0; 95\% \text{ CI: } 23.6–28.3 \)) was greater than the increase in nonedible cannabis exposures (\( \beta = 5.7; 95\% \text{ CI: } 1.4–9.9 \)), confirmed by a significant interaction term in a combined model (interaction...
term coefficient 20.3; 95% CI: 15.8–24.8; P < .001).

Children aged 3 to 5 years experienced the highest proportion of all exposures (43.1%). Most cases were exposed by ingestion (72.0%). A small proportion experienced major (1.4%) or moderate (15.4%) medical outcomes. In 2019, areas with legal adult cannabis use reported greater pediatric cannabis exposures compared with states without this policy: 975 exposures (8.9 per 100 000 population) versus 972
exposures (3.4 per 100,000 population). The proportion of calls due to edible cannabis product exposures was greater in legal states than in states without this policy: 62% vs 46% (P < .001).

DISCUSSION
Poison center calls associated with pediatric exposure to cannabis increased in the United States from 2017 to 2019; the increase appears to be largely composed of unintentional exposures to edible cannabis products. Pediatric exposures were more frequent, and more often involved edible products, in states with legal adult cannabis use.

A limitation of these data is that they rely on self-reports, potentially leading to underestimation of cases. Data were extracted from the NPDS before the annual “locking” of the database, so the 2019 data may be subject to minor changes.

The trend we observed could be expected to continue or increase. Cannabis consumers may shift from combustible to edible products because of the epidemic of e-cigarette– and vaping product–associated lung injury in late 2019. In addition, as many states close or restrict access to school and child care centers to mitigate the coronavirus disease pandemic, increases in unintentional ingestions of potentially harmful substances at home are of growing concern. State governments, particularly those with legal adult use, should consider issuing additional warnings about safe storage of cannabis. Regulators should ensure that packaging policies require child-resistant plain and opaque containers and that products, particularly edible products, do not appeal to children.

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ABBREVIATIONS
CI: confidence interval
NPDS: National Poison Data System

FIGURE 1
Cannabis product exposure among US children aged 0 to 9 years (quarterly counts for 2017–2019). All cannabis generic codes were obtained from the NPDS. Exposures were deduplicated (ie, if >1 cannabis type was involved \(n = 6\)), and those with final medical outcomes of “confirmed non-exposure” \(n = 38\) or “unrelated effect, the exposure was probably not responsible for the effect(s)” \(n = 34\) were excluded. The “edibles” category includes only the NPDS code for edibles 0310121. The “other cannabis products” included concentrates 0310124 \(n = 424\), dried plant 0083000 \(n = 1479\), capsule or pill 0310122 \(n = 23\), unknown preparation 0310126 \(n = 177\), pharmaceutical 0200618 \(n = 64\), topical 0310125 \(n = 13\), undried plant 0310123 \(n = 11\), vaporizer liquid or unknown if flavored 0310096 \(n = 48\), vaporizer liquid with flavoring 0310034 \(n = 5\), vaporizer liquid without flavoring 0310033 \(n = 2\), marijuana liquid flavor unknown 0310097 \(n = 15\), marijuana liquid with flavor 0310036 \(n = 6\), and marijuana liquid without flavor 0310035 \(n = 3\). Q1, quarter 1; Q2, quarter 2; Q3, quarter 3; Q4, quarter 4.

FINANCIAL DISCLOSURE: The American Association of Poison Control Centers (AAPCC) (http://www.aapcc.org/) maintains the national database of information logged by the country’s poison centers (National Poison Data System). Case records in this database are from self-reported calls: they reflect only information provided when the public or health care professionals report an actual or potential exposure to a substance (eg, an ingestion, inhalation, or topical exposure, etc) or request information and/or educational materials. Exposures do not necessarily represent poisoning or overdose. The AAPCC is not able to completely verify the accuracy of every report made to member centers. Additional exposures may go unreported to poison centers, and data referenced from the AAPCC should not be construed to represent the complete incidence of national exposures to any substance(s).

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