RADARS® SYSTEM

Researched Abuse, Diversion and Addiction-Related Surveillance System

QUARTERLY Technical REPORT

Fourth Quarter, 2017

Prevalence of inhalation and injection use among intentional abuse exposure cases involving methylphenidate in the Poison Center Program

Key Findings

1. Between January 2011 and September 2017, 14.2% of methylphenidate intentional abuse exposure cases involved inhalation when the route was known. This was greater than the percentage for amphetamines (10.2%), oxycodone (10.3%), and hydrocodone (4.2%).
2. The percentage of intentional abuse exposure cases that involved injection use (7.9%) was greater than the percentage of amphetamine cases (3.2%) and hydrocodone cases (0.9%).
3. Medical outcomes tended to be more severe among intentional abuse exposure cases that abused via either injection or inhalation, with moderate effects being the most common.

Background

Altering the dosage forms of prescription opioid tablets or capsules to allow for non-oral routes of administration is associated with more severe medical outcomes among cases reported to poison centers.[1] Stimulants such as methylphenidate are also commonly abused prescription medications. Similar to opioids, these medications may be administered via routes inconsistent with the product label (e.g. injection, inhalation). For example, Teter and colleagues[2] found that 38% of illicit users of stimulants report abuse via snorting. This analysis examines the percentage of intentional abuse exposure cases reported to poison centers that involve inhalation or injection and how these percentages compare to those for other prescription medications. In addition, severity of medical outcome of cases that involve either injection or inhalation are compared to those that involve routes other than inhalation or injection.

Methods

The Researched Abuse, Diversion and Addiction-Related Surveillance (RADARS®) System Poison Center Program obtains data from participating poison centers which manage exposure calls from individuals within the general population and from healthcare providers who are seeking advice regarding potential toxic exposures. The Poison Center Program can detect product-specific prescription drug abuse and misuse in near real-time, and its data can be used to calculate population and drug utilization based rates. Poison Center Program data collected through the RADARS System provide an estimate of change in intentional abuse, misuse, and deaths associated with these drugs. As of September 2017, the Poison Center Program collected data from 50 regional US poison centers in 48 states, including urban, suburban, and rural regions (providing coverage for over 93% of the US population). Investigators at each participating poison center collect data using a nationally standardized electronic health record. Detailed definitions of exposure reasons and medical outcomes are provided in the 2016 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 34th Annual Report.[3]

This study examined intentional abuse exposure cases involving methylphenidate and three comparator groups (amphetamines, oxycodone, and hydrocodone) from January 2011 through September 2017. Amphetamines were selected as a comparator group because they are another stimulant medication. Oxycodone and hydrocodone were selected as comparators because they are commonly prescribed opioids with abuse potential. Oral ingestion is the route of administration listed on the product label for all comparator products. Only intentional abuse exposure cases where the route of administration of the product could be determined were included. The following criteria were used to assign route of administration:

1. The route of administration for the particular product was described in the notes pertaining to the case
2. Only one route of administration was coded by the specialist in poison information (SPI). In this scenario, the route of administration was applied to all substances reported with the exposure
3. Only one substance was involved in the exposure and the SPI identified routes of administration. In this scenario, all routes of administration were applied to that substance.

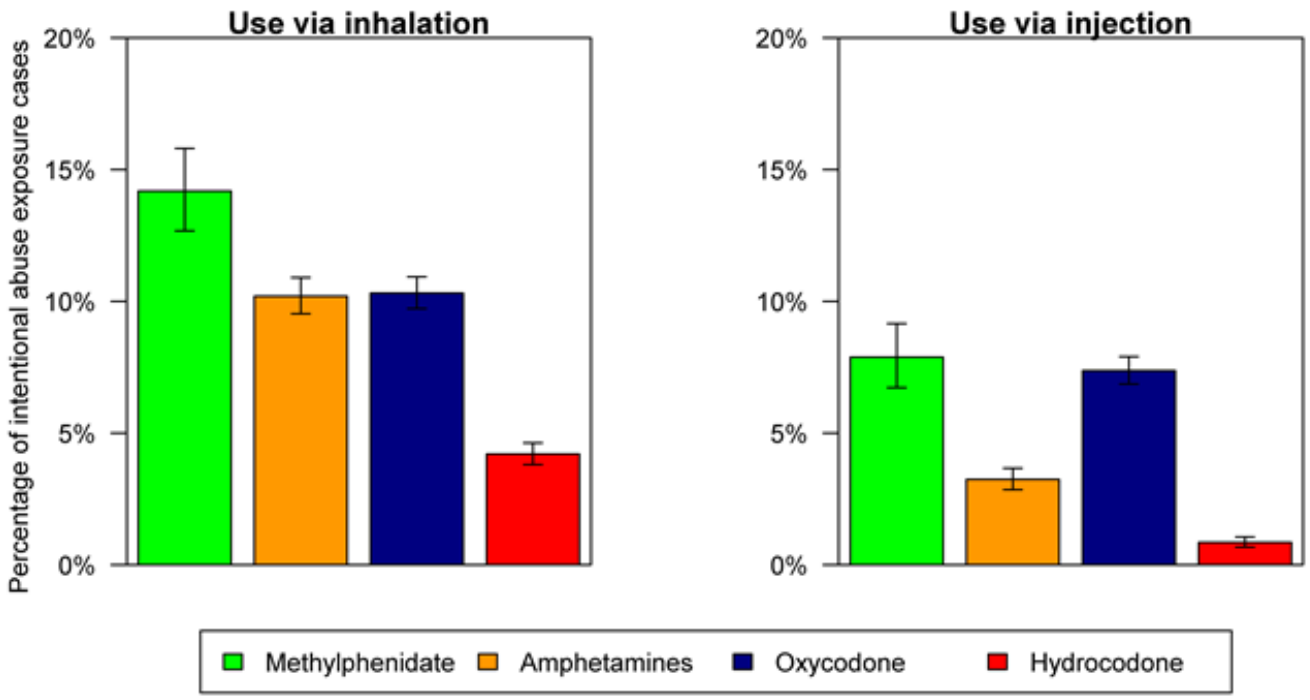
We examined the number of intentional abuse exposure cases for each drug substance with a known route of administration and calculated the rate of these cases per prescriptions dispensed and the percentage of cases that involved either inhalation or injection use. We also examined the proportion of intentional abuse exposure cases involving methylphenidate that resulted in no effect, minor effect, moderate effect, major effect, or death.

Results

There were 1,966 intentional abuse exposure cases involving methylphenidate where the route of administration could be determined. When adjusted for prescriptions dispensed at retail pharmacies, methylphenidate abuse (0.17 cases per 10,000 prescriptions dispensed) rates were greater than hydrocodone (0.13 cases per 10,000 prescriptions dispensed) but lower than abuse rates for amphetamines (0.27 cases per 10,000 prescriptions dispensed) and oxycodone (0.30 cases per 10,000 prescriptions dispensed).

Among intentional abuse exposure cases that involved methylphenidate, 14.2% of cases involved inhalation (n=279). This was greater than the percentage of amphetamine (n=764, 10.2%), oxycodone (n=1,023, 10.3%), and hydrocodone cases (n=393, 4.2%) that involved inhalation. Injection use was involved in 7.9% of methylphenidate intentional abuse exposure cases (n=155). This was greater than the percentage of amphetamine (n=243, 3.2%) and hydrocodone (n=80, 0.9%) cases that involved injection (Figure 1).

Figure 1
RADARS® System Poison Center Program
Percentage of Intentional Abuse Exposure Cases involving Inhalation or Injection Use
by Drug Group and Route of Administration
January 2011 through September 2017



Of the 1,966 methylphenidate intentional abuse exposure cases where the route of administration could be determined, 1,447 were followed to an outcome of no effect, minor effect, moderate effect, major effect, or death. Exposures involving injection or inhalation were more likely to result in a moderate effect (table 1).

Table 1
RADARS® System Poison Center Program
Number and Percentage of Intentional Abuse Exposure Cases involving Methylphenidate
by Route of Administration and Medical Outcome
January 2011 through September 2017

Route of administration	No effect/minor effect	Moderate effect	Major effect/death
Inhalation or injection	115 (36.7%)	183 (58.5%)	15 (4.8%)
Route other than inhalation or injection	562 (49.6%)	534 (47.0%)	38 (3.4%)

Conclusions

The percentage of intentional abuse exposure cases involving inhalation use is greater for methylphenidate than for amphetamines, oxycodone, and hydrocodone. The percentage of intentional abuse exposure cases involving injection use is greater for methylphenidate than for amphetamines and hydrocodone. Over 20% of intentional abuse exposure cases where the route of administration was known and the case involved methylphenidate reported to poison centers report use via either inhalation or injection. Injection or inhalation use is associated with more severe outcomes among these exposures.

Suggested Citation

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References

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3. Gummin DD, Mowry JB, Spyker DA, Brooks DE, Fraser MO, et al. 2016 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 34th Annual Report. Clin Toxicol (Phila). 2017 Dec;55(10):1072-1252. PubMed PMID: 29185815.DOI 10.1080/15563650.2017.1388087