



Researched Abuse, Diversion and Addiction-Related Surveillance System

QUARTERLY Technical REPORT

Second Quarter, 2018

Pediatric Suspected Suicide Exposures Involving Prescription Stimulants Are Increasing Faster than Stimulant Prescriptions

Key Findings

- In each quarter between 4th quarter 2014 and 2nd quarter 2018 there have been more pediatric (19 years of age or younger) intentional exposures involving prescription stimulants than natural/semi-synthetic opioid analgesics
- Since 3rd quarter 2010 pediatric intentional exposures involving stimulants have increased 4.3% per year on average; this change is influenced by an 10.6% average annual increase in suspected suicide exposures
- Though prescriptions stimulants dispensed to patients 19 years or younger have increased since 3rd quarter 2010 (1.0% per year on average), both pediatric intentional exposures and pediatric suspected suicide exposures have increased at a faster rate

Introduction

Adolescence is a period where onset of illicit drug use is prevalent and there is increased risk of developing long term, problematic use¹. Surveillance of adolescent drug use is important in identifying emerging trends in the misuse of legal and illegal substances. Poison centers are a useful resource for surveillance of drug use as data are timely with detailed information on each exposure, including substances used, patient age and reason for exposure. In addition, because patients are seeking medical advice the substance use information may be less influenced by social desirability biases. A recent analysis of poison center data by King and colleagues² found that pediatric exposures reported to poison centers involving attention-deficit/hyperactivity disorder (ADHD) medications have increased. They observed that most exposures among adolescents are intentional (either abuse, misuse or suspected suicide). This analysis examines pediatric intentional exposures involving stimulants by:

- Comparing to trends in pediatric exposures involving natural/semi-synthetic opioid analgesics
- Examining trends in exposures by intent
- Comparing relative changes in exposure trends to changes in prescribing patterns

Methods

Data Sources

The Researched Abuse, Diversion and Addiction-Related Surveillance (RADARS®) System Poison Center Program obtains data from individuals within the general population and from healthcare providers who are seeking advice regarding potential toxic exposures. The objectives of the Poison Center Program are to detect product-specific prescription drug abuse and misuse in near-real-time and to identify geographic sites with disproportionately high rates of abuse and misuse. Investigators at each participating poison center collect

data using a nationally standardized electronic health record. In addition to obtaining exposure and substance data, the Poison Center Program collects demographic, clinical effects, treatment, and medical outcomes information. This analysis focused on data from 44 states with areas consistently covered by the RADARS System Poison Center Program since 3rd quarter 2010.

Prescriptions dispensed data are based on projections provided by IQVIA™. IQVIA obtains data on prescription drug dispensing at retail pharmacies. The IQVIA prescription database uses timely product and geographically-specific data obtained from approximately 3.7 billion prescription transactions covering 90% of all retail pharmacy transactions in the US. IQVIA uses a complex proprietary projection methodology to extrapolate from the observed data to the universe of all retail prescriptions in the US.

Study Variables

Exposures involving stimulants and natural/semi-synthetic opioid analgesics were assessed. Stimulant medications included amphetamines and methylphenidate. Natural/semi-synthetic opioid analgesics included hydrocodone, hydromorphone, morphine, oxycodone, and oxymorphone. Pediatric intentional exposures included intentional abuse exposures, intentional misuse exposures, and suspected suicides. Definitions for each are provided in the American Association of Poison Control Centers' National Poison Data System Annual Report³. Intentional unknown exposures were not included in the analysis. Only exposures with confirmed ages 19 years or younger were included. Only prescriptions dispensed to persons 19 years or younger were included.

Statistical Analysis

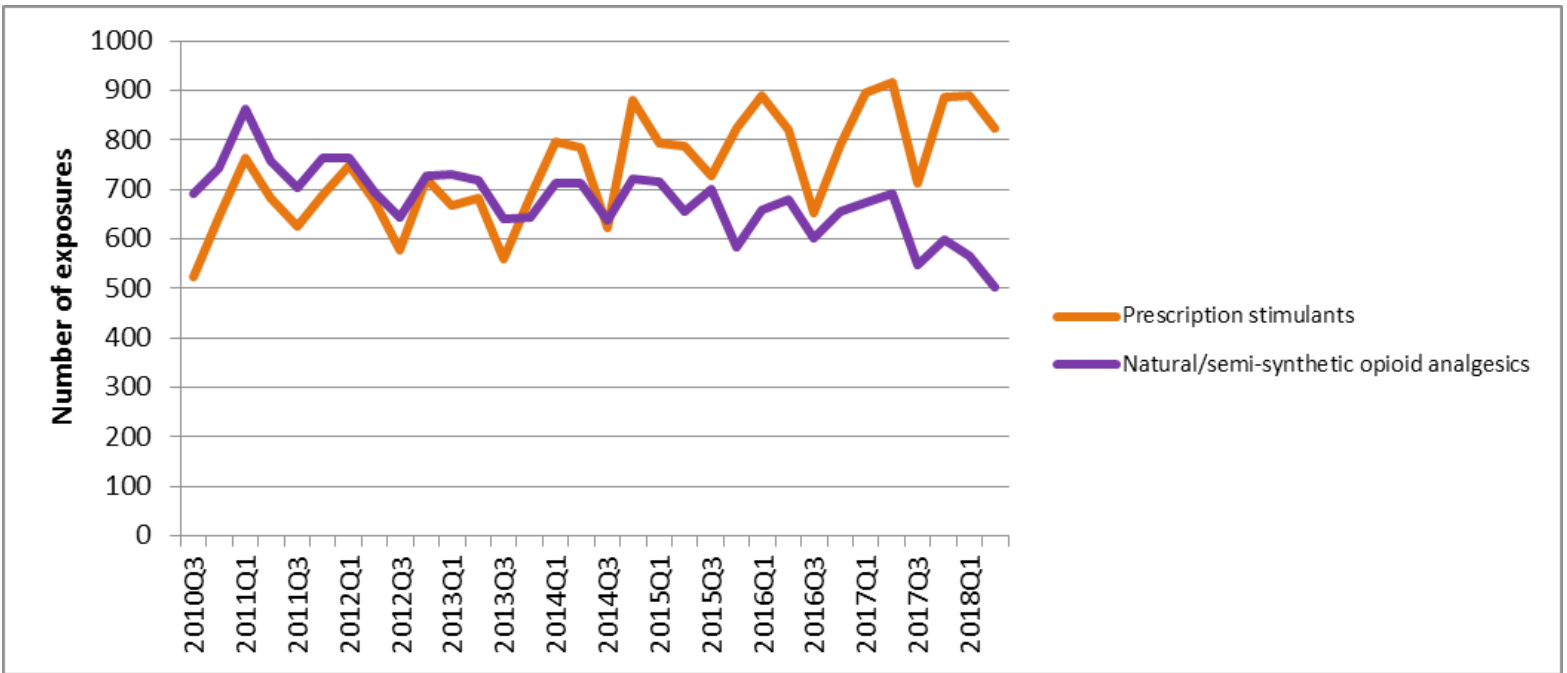
Number of unique cases involving one or more substances within each drug group and number of prescriptions dispensed within 3-digit ZIP codes consistently covered between 3rd quarter 2010 and 2nd quarter 2018 were calculated for each quarter. To calculate the average relative change in years (4 quarter intervals), a linear regression was conducted. The natural log of each outcome variable (e.g. cases, prescriptions dispensed) was regressed on a continuous variable representing each quarter standardized to provide yearly estimates. The antilog of the regression coefficient represented an average quarterly change per four quarter interval, which was converted to a percentage change.

Results

Pediatric intentional exposures involving stimulants increased from 524 in 3rd quarter 2010 to 822 in 2nd quarter 2018. The estimated yearly change was a 4.3% (95% CI: 2.6 to 6.0, $p < 0.001$) increase during the study period. By contrast, pediatric intentional exposures involving natural/semi-synthetic opioid analgesics decreased from 692 in 3rd quarter 2010 to 503 in 2nd quarter 2018. The estimated yearly change was a 3.4% (95% CI: 2.3 to 4.4, $p < 0.001$) decrease during the study period. In every quarter since 4th quarter 2014, the number of pediatric intentional exposures involving stimulants is greater than the number of pediatric intentional exposures involving natural/semi-synthetic opioid analgesics (Figure 1).

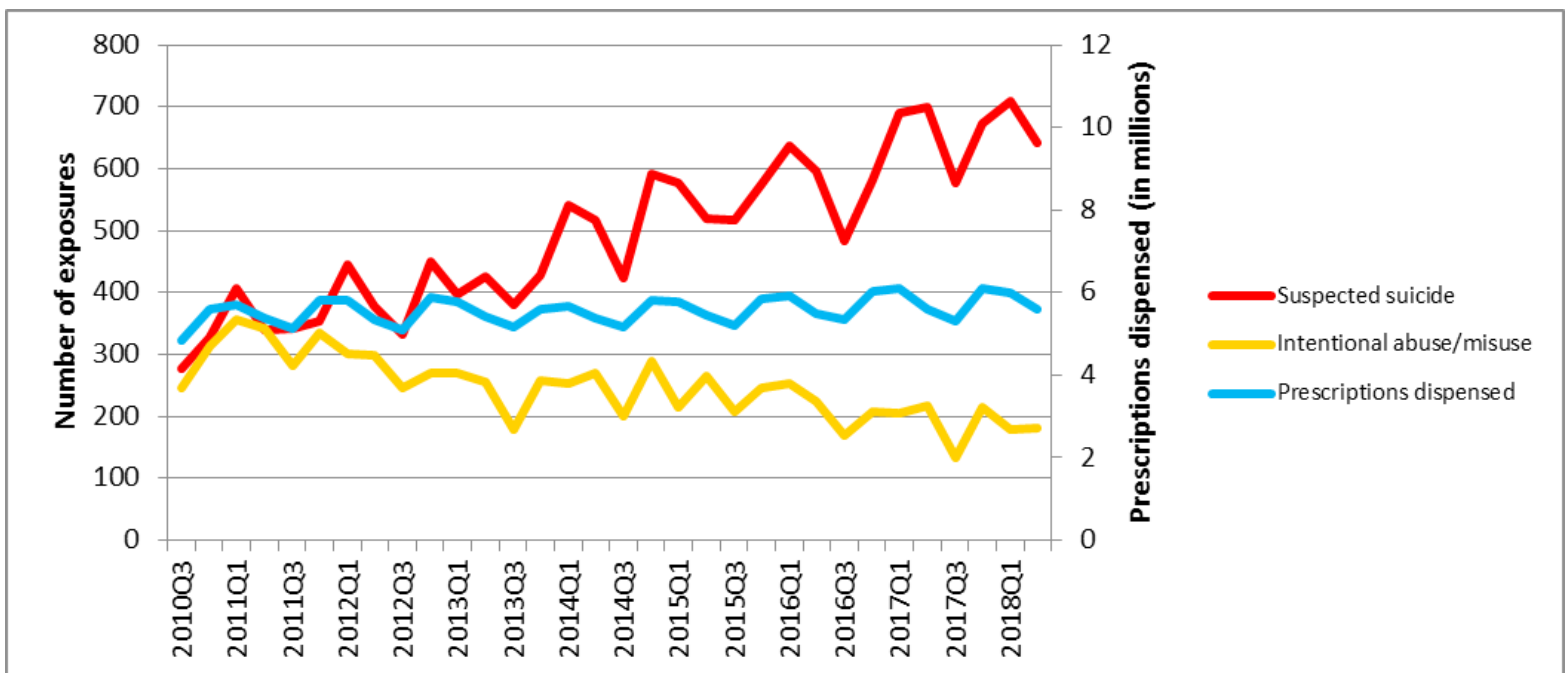


Figure 1. Pediatric (19 years or younger) intentional exposures by quarter and drug group



Pediatric suspected suicide exposures involving stimulants increased from 277 in 3rd quarter 2010 to 642 in 2nd quarter 2018. The estimated yearly change was an overall increase of 10.6% (95% CI: 8.9 to 12.4, $p < 0.001$) during the study period. In 3rd quarter 2010, there were 4.8 million prescriptions dispensed at retail pharmacies for persons 19 years or younger compared to 5.6 million in 2nd quarter 2018. Prescriptions increased by 1.0% (95% CI: 0.2 to 1.8, $p = 0.016$) annually on average during this time frame. Pediatric intentional abuse and intentional misuse exposures combined involving stimulants decreased from 247 in 3rd quarter 2010 to 180 in 2nd quarter 2018. The estimated yearly change was a 7.0% (95% CI: 5.0 to 9.0, $p < 0.001$) decrease during the study period (Figure 2).

Figure 2. Pediatric intentional exposures (19 years or younger) involving stimulants by intent and quarter and prescriptions dispensed to pediatric patients by quarter



Conclusions

Since 3rd quarter 2010, pediatric intentional exposures involving stimulants have increased. There have been more pediatric exposures involving stimulants than pediatric exposures involving natural/semi-synthetic opioid analgesics in every quarter since 4th quarter 2014. The increase appears to be driven by exposures where the intent of the patient was suicide. The relative increases in suspected suicide exposures involving stimulants exceeds increases in stimulant prescriptions among patients 19 years or younger.

Multiple factors may contribute to the observed increase in suspected suicide exposures. The increase may reflect overall increases in suicides in the United States⁴. It may also be a result of increases in stimulant misuse. Associations between non-medical use of prescription drugs (including stimulants) and suicidal ideation have been observed⁵. Because these medications are prescribed for adolescents to treat conditions such as ADHD, a population at elevated risk for substance use disorders⁶ and suicide⁷, additional safety monitoring and surveillance is advised. This includes examination of substances used with stimulants.

Suggested Citation

Svertson SG, Bau G, Dart RC (2018). Pediatric Suspected Suicide Exposures Involving Prescription Stimulants Are Increasing Faster than Stimulant Prescriptions. RADARS[®] System Technical Report, 2018-Q2.

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