

Researched Abuse, Diversion and Addiction-Related Surveillance System

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Implications of Declining Poison Center Case Volume on Drug Abuse Trend Monitoring

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Key Findings

- 1. Prescription drug abuse rates are declining in poison center case data. There are concerns that this may be due to declines in total case volumes to poison centers.
- 2. Review of 6 recent years of data from US poison centers showed that information calls were declining. Among exposure calls, rates for children declined, as did those for adults exposed to non-pharmaceutical substances (e.g., bite, stings, household chemicals, etc.). However, call volumes for pharmaceutical exposures among adults have not shown a decline in recent years.

Background

Poison centers are an important part of the public health infrastructure in the United States, providing clinical management advice for free to anyone who calls. Each of the nation's 55 poison centers is staffed by trained nurses and pharmacists, who respond to callers on a wide range of "exposures," from medications to animal stings to laundry detergent pods to food poisoning, and everything in between. Every single one of these approximately 3 million cases are logged in standardized, electronic databases each year, making them an intriguing source of data on prescription drug abuse. As of December 2016, 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), and subjects the call data to extensive manual data quality review. The data are available quickly (e.g., within a few months), and provide the earliest national view of emerging patterns in the abuse of newly marketed prescription drugs.

When we are analyzing drug abuse patterns, we often look at trends over time. These trends have consistently revealed a persistent decline in prescription drug abuse cases to RADARS System Poison Centers in recent years (Bucher Bartelson et al. 2017). However, there are concerns whether this time trend is due to overall poison center call volume declines in recent years, and whether we can continue to use these data to understand time trends about prescription drug abuse. In this report, we sought to clarify whether the decrease in the total number of calls to poison centers would influence RADARS System Poison Center Program analyses of drug abuse data.

Poison Center Call Types

Cases are classified into two major types: information cases and exposure cases (see Figure 1 based on the 2015 National Poison Data System annual report published in Mowry et al. 2016). Information cases are those where someone is just looking for information, but no substance has been consumed. Not surprisingly, in recent years a good portion of information cases have gone silent, with traffic directed to the Internet instead leading to the observed decline in overall call volume to US poison centers (Figure 2). Some poison centers do not accept identification calls, while others provide it as a service to law enforcement only. On the other hand,

exposure cases are those in which actual or suspected contact with any substance which has been ingested, inhaled, absorbed, applied to, or injected into the body, regardless of toxicity or clinical manifestation. Exposure cases are further divided into human and animal exposures. And, human exposures can be classified into pharmaceutical and non-pharmaceutical exposures, such as those arising from bites, stings, household cleaners, etc. Analgesics comprise on the largest categories of pharmaceutical exposures. The analgesics category includes over-the-counter products such as acetaminophen, aspirin, and ibuprofen, but also include prescription opioids.



Figure 1. Schematic representation of types of calls received by US Poison Centers, per 1,000 cases





Figure 1. Human Exposure Cases, Information Calls and Animal Exposure Cases by Day since 1 January 2000 Smoothing Spline Fits using lambda = 1200 for Human Exposures had associated RSqr = 0.410, Information Calls RSqr = 0.874 and Animal Exposures RSqr = 0.841.

Methods

National Poison Data System (NPDS)

The NPDS is the standardized data repository for the regional poison centers of the American Association of Poison Control Centers (AAPCC). AAPCC member centers offer coverage for the entire United States, providing free medical management services to both healthcare professionals and the general public. Data from regional poison centers is uploaded in real-time to the NPDS.

Analysis

Data were extracted from published annual reports from NPDS for data years 2009 through 2015, inclusive. The number of annual cases for children and adults were collected, stratified by pharmaceutical versus non-pharmaceutical substances involved, by year. Data were abstracted using a structured form and verified independent of the abstractor for quality assurance. The Number of Case Mentions for the opioid category in Table 22(B) was used to identify opioid analgesics; these counts were summed with any opioid analgesic (codeine, hydrocodone, oxycodone, propoxyphene and other narcotics) when found in combination with acetaminophen, aspirin, or ibuprofen. Combination analgesic products were therefore not included in the non-opioid categories in the last row of Figure 1. The public annual NPDS reports only provide age distributions for single substance exposure calls, which outweigh multi-substance calls by a factor of 7:1. For this analysis, children were defined as 19 years-old or younger. Year-to-year percent changes in call volume were calculated to visualize time trends.



Results

For children, Figure 3 reveals that both pharmaceutical and non-pharmaceutical exposure cases decreased between 2009 and 2015. Non-pharmaceutical exposure cases decreased slightly for adults. The greatest year-to-year changes happened early in the study period, and have stabilized in recent years with only a couple of percent variation. However, exposure calls among adults have experienced smaller year-to-year variation and even showed increases in 2 years.

Figure 3. Changes over time to calls to US Poison Centers involving pharmaceutical and non-pharmaceutical products



Conclusions

Our analysis suggests that observed declines in prescription drug abuse in poison center cases cannot solely be attributed to declines in overall case volume. Further analysis is needed to understand motivations for calling poison centers and the representativeness of drug abuse cases collected in this system.

Suggested Citation

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