

BRIEF REPORT

Law enforcement-derived data on gabapentin diversion and misuse, 2002-2015: diversion rates and qualitative research findings

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Abstract

Purpose: Recent limited epidemiologic and case reports suggest that gabapentin is being misused, especially among prescription opioid misusers. However, no apparent studies have reported data from law enforcement on the diversion and misuse of gabapentin.

Methods: Case report data are drawn from a quarterly survey of prescription drug diversion completed by a national sample of law enforcement and regulatory agencies who engage in drug diversion investigations. Rates of gabapentin diversion per 100 000 population were calculated for each quarter from 2002 through 2015. Qualitative data are drawn from a brief questionnaire completed by a subsample of survey respondents and were organized and presented by theme.

Results: In total, 407 new cases of diverted gabapentin were reported during the time period, with diversion rates steadily increasing from zero cases in the first 2 quarters of 2002 to a high of 0.027 cases per 100 000 population in the fourth quarter of 2015. Qualitative data suggest that gabapentin is being misused in conjunction with prescription opioids and that gabapentin and heroin are being combined and consumed together. Law enforcement reporters found these drug use trends to be contributing to gabapentin diversion.

Conclusions: The recent increase in gabapentin diversion appears to be related to the opioid epidemic, based on law enforcement descriptions of gabapentin being misused in combination with opioids. Yet epidemiological data related to this finding is limited and research conducted among gabapentin misusers is needed to understand this problem in more depth. Greater monitoring of gabapentin abuse and diversion appear warranted.

KEYWORDS

diversion, gabapentin, heroin, prescription opioids

1 | INTRODUCTION

Gabapentin, a γ -aminobutyric acid analogue, is widely used in neurology, psychiatry, and primary health care for the treatment of epilepsy and neuralgia, prescribed off-label for substance dependence disorders, and it may also be administered in combination with opioid analgesics for the treatment of pain.¹⁻⁵ Gabapentin's mechanism of action is unclear and it is believed to have no abuse potential.² When taken orally, gabapentin is transported via the L-type amino acid transporter, which results in dose-limited absorption, and therapeutic doses may

present low addictive liability levels.⁶ Thus, in the United States, gabapentin requires a prescription, but it is not scheduled under the Controlled Substances Act. However, the United Kingdom Advisory Council on the Misuse of Drugs recommended in 2016 that gabapentin be reclassified as a controlled substance.⁷

Recent limited epidemiologic and case reports suggest that gabapentin is being misused, including among individuals with histories of substance use problems and especially among prescription opioid misusers.^{2,4,8,9} In addition, it has been reported that gabapentin is being used to potentiate the effects of buprenorphine and methadone and that gabapentin and buprenorphine are used in combination for the purpose of getting high.⁹⁻¹¹

These data have not been previously posted or presented.

Despite these findings, diversion of gabapentin is understudied. A recent review notes that gabapentin is bought, sold, and traded in informal settings,² yet no systematic data on this phenomenon are apparent. Within this context, the present study aims to contribute to the scant literature by examining gabapentin diversion data from a national sample of drug diversion investigators covering the 14-year period 2002 through 2015.

2 | METHODS

Data are drawn from the Drug Diversion Program of the Researched Abuse, Diversion, and Addiction-Related Surveillance (RADARS[®]) System, a national prescription drug surveillance system. A detailed description of the methodology is available in Dart et al.¹² The Drug Diversion Program includes a voluntary quarterly survey of prescription drug diversion completed by a national sample of law enforcement and regulatory agencies who engage in drug diversion investigations. Using a standardized quarterly survey, participants record the number of new cases investigated by the agency during past 3 months, and the specific drugs involved in each case. The survey also includes a space for participants to report additional diverted prescription drugs that are not specifically listed on the survey, including gabapentin. Write-in data are reviewed, systematically standardized (eg, spelling and capitalization) and verified by 2 staff members. Data are presented from the inception of the survey to the last quarter from which data were available for analysis and include all mentions of branded and generic gabapentin.

The jurisdictional boundaries of each reporting agency are also recorded to ensure there is no case duplication with other reporting agencies. The population of each jurisdiction is calculated using US Census Bureau data. Currently, the Drug Diversion Program includes approximately 260 investigators from all states except Hawaii. The total population covered in any quarter varies depending on the specific agencies responding (1Q2002 = 146 978 328; 4Q2015 = 103 357 605); during 2002 to 2015, the mean total population of participating jurisdictions was 130 182 298. The Institutional Review Board at Nova Southeastern University deemed the study exempt from review.

Qualitative data were collected to contextualize case report data from the quarterly surveys. A small self-administered questionnaire about new drug trends was distributed via e-mail to 241 reporting agencies in April 2016. Participants were asked to provide a brief response to the question, "Have you seen or heard anything about increases in the abuse or diversion of gabapentin in your jurisdiction? If so, can you please comment on the characteristics of abusers, modes of diversion, and street value of the drugs?"

Diversion rates were examined using SPSS software, version 21. To compute diversion rates, cases were summed nationally for each quarter for the years 2002 to 2015. The sum of cases was divided by the total population covered by jurisdictions of reporting agencies for each quarter, yielding a population rate. Diversion case rates are presented per 100 000 population. A Poisson regression with a log link function and the natural log of population as the offset was used to calculate whether the change in the number of diversion cases with

time was significant. Qualitative responses from participants were entered into a database (Microsoft Excel 2010) and organized by theme (eg, abuse, diversion, and street value). The primary themes and representative quotes are included below; the total numbers of corresponding responses are shown in parentheses.

3 | RESULTS

A total of 407 cases of gabapentin diversion were reported in 41 states. The exceptions include Hawaii, Indiana, Kansas, New Jersey, New York, Texas, Washington, West Virginia, and Wyoming. The diversion rates for gabapentin by calendar quarter are shown in Figure 1. The rates have steadily increased from zero cases in the first 2 quarters of 2002 to a high of 0.027 cases (per 100 000 population) in the fourth quarter of 2015. Results from the Poisson regression indicate that the increase is significant ($P < .001$; $\beta = 0.068$; standard error = 0.004; t value = 17.47).

Seventy-three Drug Diversion Program participants responded to the optional brief questionnaire. Of those, a total of 21 participants from Alabama, California, Georgia, Idaho, Indiana, Kentucky, Louisiana, Maine, Michigan, North Carolina, Ohio, Oregon, and Tennessee described their experiences with gabapentin diversion or misuse in their jurisdictions.

Gabapentin demand is related to the misuse/abuse of opioids (N = 5):

- "Gabapentin has become a highly abused and diverted drug in our jurisdiction. Many of the abusers interviewed stated they would take it with opioids to increase the duration of the 'high'. Others would use it in place of opioids (because of drug testing) and would take anywhere from 900mg to 2400mg at once," (Tennessee).
- "We have seen a rise in the abuse of gabapentin here. It has been abused in conjunction with Suboxone[®] (buprenorphine) which has also become a major problem in East Kentucky," (Kentucky).
- "Gabapentin is becoming more popular among drug users. It is our understanding that heroin users are mixing a combination of gabapentin and heroin and injecting the compound. In several incidents, this has resulted in accidental overdose deaths in our area," (Alabama).
- "Drug users have been mixing gabapentin and heroin together and injecting. There have been approximately 5 deaths as a result of accidental overdose due to the new heroin mixture," (Louisiana).

Description of diversion cases (N = 13):

- "We have had one case in 2016 that we seized gabapentin in a search warrant," (Maine).
- "We had two cases this quarter where gabapentin was reported stolen," (Idaho).
- "I had an overdose death of a 26 year old female a couple of years ago and she was doctor shopping for gabapentin," (Georgia).

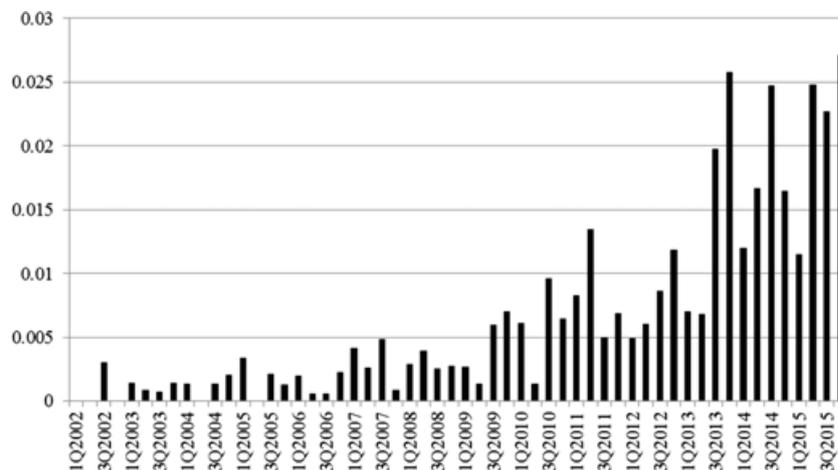


FIGURE 1 Rates of gabapentin diversion per 100 000 population by quarter, 2002 to 2015

- “Gabapentin became a noticeable issue about two years ago. It was mentioned to me by a pharmacist that they were filling more and more prescriptions for it. I did notice the same thing when looking at my doctor shoppers and larceny of pill reports” (North Carolina).
- “We bought gabapentin once in the past year; sold via Craigslist.org,” (California).

Street value (N = 2):

- “Many patients traditionally prescribed gabapentin have learned of its street value here and are selling or trading it for narcotics. Physicians have reported numerous requests for early refills,” (Kentucky).
- “Increases in contact with gabapentin. Street value is about \$10.00 a pill,” (Michigan).

The remainder of respondents reported no experience with gabapentin diversion or misuse in their jurisdictions. One participant provided additional detail and stated, “We have only heard about gabapentin from narcotics agents,” (Montana).

4 | DISCUSSION

This study documented increasing national rates of gabapentin diversion over a 14-year period, reaching a high of 0.027 cases per 100 000 population in 2015. This finding is comparable to a diversion rate of 0.021 cases per 100 000 population for OxyContin-branded oxycodone in 2015 and a combined diversion rate of 2.5 cases per 100 000 population for 6 prescription analgesics (branded and generic): oxycodone, hydrocodone, hydromorphone, fentanyl, morphine, and tramadol in 2013.^{12,13} Population estimates of gabapentin misuse in the United States are not apparent,² yet studies indicate that 15% to 26% of prescription opioid misusers, and as many as 65% of those with a gabapentin prescription, report gabapentin misuse.^{8,9,14,15} Moreover, a recent study documented a 2950% increase in gabapentin misuse for the purpose of getting high among nonmedical opioid users in Kentucky between 2008 and 2014.⁹ Given the current findings and limited literature, additional

epidemiologic research is needed to investigate specific populations, contexts, and locations in which gabapentin misuse may be a growing trend.

Qualitative data obtained from drug diversion investigators add valuable insight into this problem. These data suggest that gabapentin is being used in conjunction with, or substituting for, prescription opioids among misusers. More importantly, these qualitative data represent the first apparent reports of gabapentin and heroin being consumed in combination. Taken together, the findings serve as a sentinel data point illustrating an aspect of newly emerging prescription drug misuse practices.

This study has some limitations which must be noted. Data were obtained from case reports and a brief questionnaire provided by law enforcement and regulatory agencies that do not cover all areas of the United States and may not be a representative sample of all prescription drug diversion investigations. Because gabapentin is not specifically listed on the quarterly survey and only included as a “write-in” drug, gabapentin diversion cases may be underreported.

Despite these limitations, the findings from this study represent the first apparent longitudinal data on gabapentin diversion. Based on qualitative data from law enforcement, the most recent increase in gabapentin diversion may be related to the (mis)use of prescription opioids and heroin. Research conducted among gabapentin misusers is needed to understand this problem in more depth and greater monitoring of gabapentin abuse and diversion appear warranted. Moreover, postmarketing surveillance to systematically monitor gabapentin diversion may help to mitigate any potentially emerging public health problems.

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CONFLICT OF INTEREST

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DISCLOSURE

The RADARS[®] System is supported by subscriptions from pharmaceutical manufacturers for surveillance, research, and reporting services, and RADARS[®] is the property of Denver Health and Hospital Authority, a political subdivision of the State of Colorado. Denver Health and Hospital Authority retains exclusive ownership of all data, databases, and systems. Subscribers do not participate in data collection or analysis, nor do they have access to the raw data.

Key Points

- Data collected from a national sample of law enforcement agencies document increasing rates of diversion of gabapentin between 2002 and 2015.
- Drug diversion investigators report gabapentin being used in conjunction with prescription opioids and also that gabapentin and heroin being are combined and consumed together.

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