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Publication Date

2017

Prescription Drug Abuse and Prescribing Patterns in a Large Regional Area

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ABSTRACT

Background

The Centers for Disease Control and Prevention (CDC) has declared prescription drug abuse a national epidemic, with over 100 deaths per day attributed to medication misuse and abuse (1). Prescription drug monitoring programs (PDMPs) may be one effective strategy in the prevention of controlled substance diversion and abuse. We look at trends in prescription drug usage and prescribing patterns from 2008-2013.

Objective

To characterize San Diego County trends in controlled substance availability and abuse from 2008-2013, in the setting of implementation of the state's PDMP, Controlled Substance Utilization Review and Evaluation System (CURES) in 2010, as well as county initiatives for responsible prescribing.

Methods

This is a retrospective review of CURES data for San Diego County from 2008-2013. Rates of prescription drug usage were determined using population data over time, and controlled medications were categorized as opiates, benzodiazepines, and stimulants.

Results

The annual rate of opiates and benzodiazepines prescribed per person in San Diego county increased from 2008 to 2012, then decreased in 2013. The rate of stimulant prescriptions saw a small increase. The rate of unintentional prescription drug related death in the county also rose and then fell correspondingly.

Conclusions

The availability and usage of controlled medications increased between 2008 and 2012, then decreased slightly in 2013, with the exception of a slight increase in the stimulant category. These findings suggest that state and local measures may be making progress on the reduction of prescription drug diversion and abuse in San Diego county.

Keywords: prescription, opiate, PDMP, drug abuse, San Diego

INTRODUCTION

The 2011 National Survey of Drug Use and Health (NSDUH) estimated that over 14 million persons aged 12 or older misused pharmaceuticals nonmedically in 2011, to include prescription pain relievers, tranquilizers, stimulants, or sedatives (2). The use of prescription opioid medications in San Diego County have largely mirrored national trends, with dramatic increases in availability and usage over the past decade.

The wide ranging impact and consequences of prescription drug misuse or abuse are significant, to include adverse health consequences, emergency department utilization, substance abuse treatment admissions, and unintentional drug overdose fatalities. Each year costs an estimated \$534 billion in drug abuse related crime, health care, and law enforcement expenses (2). Drug overdose is the second leading cause of death from unintentional injuries in the United States, exceeded only by motor vehicle fatalities, and a significant portion of the rising numbers can be attributed to the increase in nonmedical use of prescription pain-relief drugs (3). Nearly three of four prescription drug overdoses are caused by opioid pain relievers. In 2008, they accounted for 14,800 overdose deaths, more than heroin and cocaine combined (1). National estimates of drug-related emergency department (ED) visits compiled by the Center for Behavioral Health Statistics and Quality report that medical emergencies and subsequent Emergency Department (ED) visits related to nonmedical use of pharmaceuticals increased 132 percent in the period from 2004 to 2011 (2). A significant contributor to this was a 183 percent increase in the cases involving opiates/opioids, with 315,000 more visits involving opiates/opioids in 2011 than in 2004 (2).

The situation poses a unique challenge for physicians, who are responsible for both beneficence and nonmaleficence, and have an ethical obligation to provide their patients with effective treatment and management of pain. Concerns remain regarding the potential for underdiagnosis and undertreatment of pain, especially for ethnic and racial minorities (3). However, prescribing controlled substances can subject physicians to regulatory and administrative burdens, with the threat of criminal and civil penalties for failure to comply with state and federal requirements. A physician can be sued on charges of negligence, for failure to adequately medicate a patient. However, he or she can also be sued for overmedication that results in adverse effects or addiction (3).

Management of patients with pain-related diagnoses is challenging in an ED setting. The appropriate resources and multidisciplinary staffing to address pain management are not typically integrated into the ED (4). Overcrowding in the ED has been studied as a pervasive problem with one consequence being diminished attention to appropriate pain care (5). Moreover, the phenomenon of “drug-seeking behavior” has clinicians wary of patients who provide histories that may potentially contain inconsistencies or falsifications associated with the inappropriate seeking of pharmaceuticals (5). In general, the severity of pain can neither be verified nor disproved, and ED physicians believe that the ED is a last resort for many of these patients (6). So they tend to err

towards providing a limited allotment of opioid medications, in the effort to treat them to the best of their ability (6). Emergency physicians prescribe a number of opioid analgesics, including Vicodin, Norco, Lortab, Lorcet, Percocet, Percodan, Tylox, and Tramadol, and recent data has shown associated increases in abuse of these drugs (7). However, they also believe that the ED is not the optimal setting for treating patients suffering from chronic pain conditions, and that such episodic treatment with short duration agents could lead to an increase in ED utilization for pain control (6).

Prescription drug monitoring programs (PDMPs) may be one effective strategy in the prevention of patient efforts to obtain controlled medications via multiple doctors, as well as reduction in diversion of these drugs for non-medical use. The Controlled Substance Utilization Review and Evaluation System (CURES) has been the PDMP in California since 2008, and is managed by the California Department of Justice. CURES includes data reported from outpatient pharmacies required by law to input controlled medication information on a weekly basis. The reported data includes: (a) patient name and address, (b) prescriber's name and license, (c) pharmacy name, address, and license number, (d) medication name, (e) number of pills dispensed, (f) number of refills, (g) date of original prescription, (h) date medication was dispensed. It allows authorized users, such as licensed healthcare prescribers, dispensing pharmacists, law enforcement, and regulatory boards to access online Patient Activity Reports (PARs) in an effort to obtain timely patient controlled substance history information. The goal is for the database to assist in the identification of controlled substance abuse and diversion patterns, and thereby result in more informed physician prescribing decisions and subsequent improved pain management in EDs, discouragement of the practice of "doctor shopping," and reduction of the total amount of controlled pharmaceuticals available for diversion to the general public, ultimately reducing the rate of prescription drug abuse in California.

Having just been instituted in 2008, the CURES program remains relatively new and its utilization is still growing. Although awareness of the program is fairly widespread, like any new program its natural obstacles to utilization have included complexity of access and timely application in clinical practice. The system is not be considered "real time," as dispensers are permitted up to one week for reporting to CURES by state law. Expanded mandates for CURES implementation now state that "All individuals practicing in California who possess both a state regulatory board license authorized to prescribe, dispense, furnish or order controlled substances and a Drug Enforcement Administration Controlled Substance Registration Certificate (DEA Certificate) must register to use CURES by January 1, 2016" (8). There is no state mandate at this time requiring prescribers or dispensers to consult the CURES database prior to writing prescriptions for or dispensing controlled substances.

As the program is still evolving, it may not yet be reasonable to draw any specific conclusions regarding its overall effectiveness in achieving its ultimate goals. However, it

is still possible to use CURES data to determine prescribing patterns in San Diego County, for the identification of any overall trends since implementation.

METHODS

Study Design

This was a retrospective review of data reported from 2008-2013 to the Controlled Substance Utilization Review and Evaluation System (CURES). CURES data from San Diego County was used for this study in the review of Schedule II, III, and IV prescriptions filled during this time period.

Study Population and Data Sources

San Diego County has an estimated population of 3.26 million people, provided by the San Diego Association of Governments (SANDAG), which produces annual demographic estimates and long-range forecasts, and maintains U.S. Census Bureau information. This puts the county population at larger than 20 of 50 states, and is the fifth most populous county in the United States. Almost half of county residents live within the city of San Diego, while the remainder live in smaller jurisdictions and unincorporated areas. Non-patient de-identified aggregate data for San Diego County was utilized.

Data Analysis

For the purpose of data analysis, medications that contributed to overdose deaths and addiction in San Diego county are categorized as painkillers or opiates (pain management), central nervous system depressants or benzodiazepines (anxiety management), and stimulants (attention deficit/hyperactivity/somnolence disorders). Morphine equivalency is the measure of relative opioid strength used by the CDC, and was used as the standard measurement in this study as well. This data was then analyzed to determine the rate of total pills/person prescribed from each drug category listed above (an average of total pills per every county resident, calculated by the total number of pills dispensed, divided by the total population for each year). For the opioid painkillers, rate of opioid prescriptions by type (rates of brand or generic types of opioids or painkillers), and morphine equivalencies prescribed per person (units of morphine prescribed per person in the form of all opioids) were determined.

RESULTS

Figure 1 depicts the rate of pills per person prescribed for San Diego County from 2008 through 2013. There was a steady increase in the annual rate of prescription of all three types of controlled substances from 2008 to 2012. During this time, the largest percentage increase was for opioids (26.3%), followed by stimulants (26.0%). In 2013, there were 36.3 opioid, 13.6 benzodiazepine, and 4.9 stimulant pills prescribed per resident in the county. Accounting for population growth, these numbers are an overall increase from 2008, when there were 30.0 opioid, 11.3 benzodiazepine, and 3.8 stimulant pills prescribed per person. However, they also mark a decrease from the

previous year in opioids and benzodiazepines prescribed per person, with a slight increase in stimulants. Preliminary data for 2014 also suggest a reduction in all three categories (9).

The rate of opioid prescription can be further categorized by type, including hydrocodone, oxycodone, codeine, fentanyl, hydromorphone, methadone, and morphine (Table 1). In 2012, hydrocodone was the most prescribed medication with 21.06 pills prescribed per person in the county, followed by oxycodone at 10.04 pills per person. The rate of morphine equivalent prescription per person for all opioids increased by 30.1% from 2008 to 2012 (Table 2).

In San Diego County, the overall rate of unintentional prescription drug related deaths increased during the time period 2008-2012, then decreased in 2013 and 2014 (10). The total number and rate per 100,000 residents of emergency room painkiller-related discharges, however, continued its overall upward trend from 2008 to 2013 (Table 3).

DISCUSSION

The San Diego County Prescription Drug Abuse Task Force (PDATF) began in late 2008 as the Oxy Task Force, with the recognition of a growing oxycontin abuse problem by county and federal agencies, as well as local community members. The task force grew in membership and scope, and was renamed as the PDATF in 2010 with the understanding that the prescription drug abuse problem extended beyond oxycontin. The PDATF creates an annual Rx Report Card in order to compile data points and factors potentially contributing to the complex problem of misuse, addiction, and overdose in San Diego County. It lists annual rates and five-year trends of local Rx-related overdose deaths, emergency department Rx-related discharges, drug treatment admissions, and rates of controlled substance prescription, in addition to other measures.

The San Diego and Imperial County Prescription Drug Abuse Medical Task Force was formed in 2012, and is a coalition of medical leaders that includes various medical specialties, competing health systems, and government entities, who have joined efforts to reduce addiction and death due to prescription drugs. Almost one person dies per day in the county from this preventable cause, and prescription related deaths remains the number one cause of unintentional death in San Diego county, higher than motor vehicle related fatalities and mirroring the national trend (11). The specialists include pain medicine, internal medicine, emergency medicine, hospice care, psychiatrists, dentists, pediatricians, and pharmacists. Health partners include Kaiser Permanente, Scripps Health, Sharp HealthCare, UC San Diego Health System, Palomar Health, Community Clinics, and Urgent Care Clinics. Public Health, California Hospital Association, and the DEA are involved as well. Since its formation in October 2012, the task force launched www.sandiegosafeprescribing.org in an effort to promote a community-wide consensus on guidelines for the prescribing and weaning of controlled substances, information on CURES access and working with the DEA, and other related

educational objectives. As part of this effort, the group secured agreement on several key concepts. One tool developed and promoted by the task force was safe pain medication prescribing guidelines for prescribers. A second tool was a “patient medication agreement,” recommended for use with those patients utilizing controlled substances for periods longer than three months. A third tool included “safe pain medication prescribing in emergency departments” and “safe pain medicine prescribing in urgent cares” documents, endorsed by all the emergency departments in San Diego and Imperial counties, Hospital Association, and Health Departments. It is recommended that these guidelines are distributed to every patient discharged from the emergency department. All of these tools are currently widely utilized in hospital and primary care settings, including community clinics.

Prescriptions for opioids and benzodiazepines increased nationwide from 2008 to 2010, then decreased from 2011 to 2013 (12). This study confirms the similar overall trend in San Diego County from 2008 to 2012 of an increased rate in the prescription of opioids, benzodiazepines, and stimulant medications. However, since the inception of CURES and additional implementation of the medical task force guidelines in 2012, there has been a slight downward movement in the past two years of both rate of controlled substance prescription and unintentional Rx-related deaths in San Diego County. This is consistent with recent analysis of data from the Researched Abuse, Diversion, Addiction-Related Surveillance (RADARS) System, which noted significant increases in national trends towards opioid abuse and diversion from 2002 to 2010, with flattening or reduction in rates between 2011 and 2013 (12). Our subsequent findings are similar to national trends, in that increased availability of prescription drugs before 2011 seems to have paralleled increases in drug abuse and drug-related deaths in San Diego County. It would also seem that the combination of state level prescription monitoring with county-led establishment of prescription guidelines and educational programs, in the context of national initiatives to reduce opiate availability, has been effective in reducing the overall rate of opiate abuse and opiate-related deaths.

It is important to note that the county has also seen a rise in indicators of heroin abuse during the last five years, particularly in 2013-2014 (10). PDATF data shows a consistent increase in heroin seizures and treatment admissions from 2010-2015. SANDAG’s Substance Abuse Monitoring Program reported that of arrestees who reported heroin use in 2012, 27% said they began with prescription opioids prior to experimenting with heroin. Of this group, 63% said heroin was both easier to obtain and less expensive. These findings have been consistent over time in San Diego County, with 40% of intravenous drug users surveyed in 2010, who said they had misused opioids prior to trying heroin injection (13). This is in line with national studies that have also shown users switch to heroin after painkillers become either more difficult to obtain, more expensive, or are converted to less useable formulations. Data shows that County heroin-related deaths have increased with the indicators for heroin abuse, which also mirrors National Survey on Drug Use and Health reports of increasing heroin abuse and related deaths from 2002-2014 (12). While it is hopeful that efforts to stem the rising

tide of prescription drug abuse seem to be having success, it is important for public health policy to also consider the corresponding rise in heroin abuse, in the development of future prevention and treatment initiatives.

Limitations

An appropriately designed and implemented program could potentially have a significant health impact, by identifying those patients at higher risk for opioid misuse, addiction, and overdose. However, various states with PDMPs currently in use have had widely varying functional parameters and their overall impact remains unclear. Comparative or inclusive evaluations of such programs will generally be limited by some amount of confounding, given that states with higher drug abuse rates may also be states more likely to have a PDMP. Moreover, many of these programs are still in their formative early stages and continue to undergo substantial revision. This study considered only data within the state of California via the CURES program and trends within one major region in order to mitigate some of these biases, however, there remain some important limitations for consideration.

CURES data only includes prescription data submitted by participating pharmacies within California. It does not include controlled medications dispensed from inpatient hospital pharmacies, methadone clinics, or physician practices that dispense medications directly from their office. Federal government pharmacies are not required to submit data to CURES, however, Veterans Health Administration facilities began entering CURES data in August 2014. The database also does not include liquid form medications or prescriptions transported from other states, Canada, or Mexico. Finally, there is no way to differentiate between medications that are potentially diverted for self-treatment versus recreational use.

Conclusions

CURES is only one arm of the growing movement towards greater coordination and communication among prescriber, dispenser, patient, and law enforcement in the state of California. However, it also allows for the collection of basic data and subsequent monitoring of trends that can then be used to help formulate new or redesign existing strategies that also form the county's response to a significant problem with prescription drug abuse. Trends on dispensing and therefore availability have been shown to correlate with trends on prescription-related overdose death rates. Tracking of general controlled substance availability via CURES can therefore assist with not only identifying possible misuse or diversion of medications and doctor shopping, but also potentially early intervention in the cases of patients who are at high risk for future addiction and overdose related consequences.

ARTICLE SUMMARY

1) Why is this topic important?

Consequences of prescription drug abuse include adverse health consequences, emergency department utilization, substance abuse treatment admissions, and unintentional drug overdose fatalities. This results in an estimated \$534 billion in drug abuse related crime, health care, and law enforcement expenses

2) What does this review attempt to show?

State PDMP awareness and utilization, in conjunction with county safe prescribing initiatives, are making progress in the efforts to prevent the diversion and misuse of controlled substances.

3) What are the key findings?

Prescription drug abuse and prescribing patterns in San Diego County have largely mirrored national trends, with a steady increase in opiate and benzodiazepine usage and prescription rate per person up to 2012, and a small reduction from 2012 to 2013. The findings suggest that increasing state PDMP utilization and local safe prescribing initiatives are having an impact on the prevention of controlled substance diversion and usage.

4) How is patient care impacted?

There will be a greater need for communication between provider, pharmacy, and patient, with regards to the role of PDMPs and safe prescribing guidelines in the realm of patient pain management.

FIGURES/TABLES

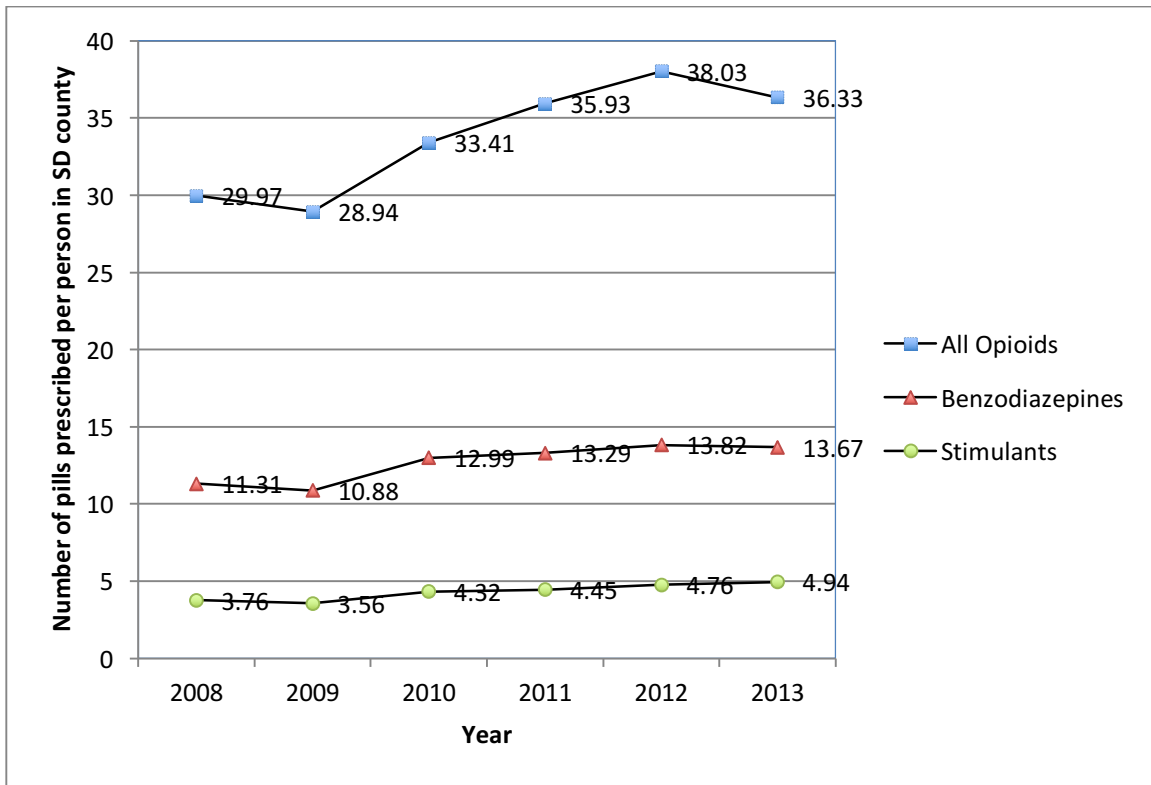


Figure 1. Total number of pills prescribed per person in San Diego County, 2008-2013

Drug	2008	2009	2010	2011	2012	2013
Codeine	1.92	1.62	1.75	1.65	1.58	1.4
Fentanyl	0.27	0.21	0.23	0.22	0.2	0.18
Hydrocodone	17.63	16.66	20.03	20.09	21.16	19.98
Hydromorphone	0.68	0.72	0.86	0.96	1.09	1.06
Methadone	1.26	1.23	1.42	1.47	1.09	1.06
Morphine	1.59	1.63	0.47	2.14	2.25	2.21
Oxycodone	6.53	6.76	8.48	9.17	10.09	10.04
Oxymorphone	0.08	0.1	0.18	0.23	0.22	0.2

Table 2. San Diego County Morphine Equivalency Among Opioid Types, 2008-2013

Drug	2008	2009	2010	2011	2012	2013
All opioids	398.70	387.45	410.27	489.31	521.18	501.12
Codeine	9.86	8.34	8.89	8.32	8.00	7.09
Fentanyl	0.08	0.06	0.07	0.07	0.07	0.07
Hydrocodone	119.48	115.26	142.36	144.40	154.86	148.65
Hydromorphone	17.69	13.23	13.99	16.55	18.09	17.54
Methadone	36.06	34.60	39.93	41.19	40.19	34.87
Morphine	59.90	59.79	12.38	77.45	80.17	76.33
Oxycodone	151.37	150.92	182.74	186.40	206.56	205.21
Oxymorphone	4.26	5.25	9.91	14.93	13.25	11.36

Table 3. San Diego County Rx-Related Deaths and ED Painkiller-Related Discharges, 2008-2013

	2008	2009	2010	2011	2012	2013
Unintentional Rx-Related Deaths						
• Number	220.00	238.00	228.00	267.00	268.00	259.00
• Rate per 100,000 residents*	7.30	7.80	7.40	8.60	8.50	8.20
ED Painkiller-Related Discharges						
• Number	2040.00	2231.00	2931.00	3278.00	3791.00	5723.00
• Rate per 100,000 residents*	67.30	72.80	94.70	105.20	120.60	180.00

*SANDAG population figures based on 2010 Census data and 2008-2013 census bureau estimates

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