The Secure and Responsible Drug Disposal Act of 2010: How Effective Has It Been in Preventing Pediatric Drug Related Deaths?

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Disclosures

• The authors declare no conflicts of interest
Introduction

• The growing opioid epidemic in the United States is well documented

• Opioid-related deaths have increased from 33,000 to 43,000 from 2015 to 2016

• The number of prescription narcotics available in North America has increased by a factor of 2 from 2001 to 2013
Introduction

• The prevalence of prescription opioid overdose and opioid related deaths in the pediatric population is increasing.

• From 1999 to 2016, 3-fold increase in the mortality rate from prescription opioids

Introduction

• Over 1/3 patients who prescribed and obtained opioids never use them
• Over 80% of patients have excess medications
• Only 4% of these patients properly dispose of their medications
• Drop-off boxes for proper disposal have been proposed, making them inaccessible for ingestion by children
Introduction

• In 2010, the Secure and Responsible drug Disposal Act (SRDA) was passed by Congress

• In 2011, Clark County began placing drug drop-off boxes at 14 police stations around the city

• Local pharmacies, airports, municipal buildings have added additional sites over the years

• The effectiveness of these drop-off boxes in preventing pediatric deaths is unknown
Materials and Methods

• Utilizing Clark County Coroner’s office data, we identified pediatric deaths (< 18 years) which occurred from 2004—2017
  
  • Prescription related deaths: caused by the ingestion of drugs legally available from a pharmacy by prescription
  
  • Deaths by illicit drugs and alcohol were excluded

• Utilizing US Census and county information:
  
  • Annual death rate per 100,000 pediatric population was calculated for each year

• Utilizing information from the Centers for Disease Control (CDC):
  
  • Number of opioid prescriptions dispensed per 100 persons in Clark County from 2006—2017
Materials and Methods

• Drop-off boxes were initiated in 2011

• For time periods 2004-2010 and 2011-2017:
  • Average annual death rate per 100,000 pediatric population
  • Average opioid dispense rate per 100 persons

• Compared average annual death rates and average opioid dispense rates with independent samples t-test
  • An alpha level of 0.05 was used for all significance tests
Results

Prescription Related Deaths and Annual Death Rate

• Before 2011:
  • 41 pediatric prescription-related deaths for an average rate of 1.27 per 100,000

• After 2011:
  • 28 pediatric prescription-related deaths for an average rate of 0.77 per 100,000

Table 1. Pediatric Death Rate

<table>
<thead>
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<th>Years</th>
<th>Deaths</th>
<th>Average Death Rate (per 100,000)</th>
<th>p</th>
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</thead>
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<td>1.27</td>
<td>0.02</td>
</tr>
<tr>
<td>After 2011</td>
<td>28</td>
<td>0.77</td>
<td></td>
</tr>
</tbody>
</table>
Results

Opioid Dispense Rate

• Before 2011:
  • Average dispense rate of 92.8 per 100 persons

• After 2011:
  • Average dispense rate of 88.4 per 100 persons

Table 2. Opioid Dispense Rate

<table>
<thead>
<tr>
<th>Years</th>
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<th>$p$</th>
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</thead>
<tbody>
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<td>Before 2011</td>
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<td>0.17</td>
</tr>
<tr>
<td>After 2011</td>
<td>88.4</td>
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</tbody>
</table>
Results

Pediatric Death Rate and Opioid Dispense Rate

Figure 1. Death rate per 100,000 pediatric population and opioid dispense rate per 100 persons in Clark County by year.
Discussion

• Before the SRDA, proper disposal of unwanted extra prescription medications was labor-intensive

• There was a demonstrable decrease in pediatric deaths associated with prescription drugs after 2011 (the time that drop-off boxes were implemented)

• The increase in use and enforcement of Nevada’s prescription-monitoring program (PMP) may confound the effectiveness of drop-off boxes

• However, dispense rates across the same period (before and after 2011) were not significantly different

• Direct causation cannot be concluded, but implementation of drop-off boxes appears to have some positive effect on decreasing pediatric prescription-related deaths
Discussion

• Previous studies on other public health measures such as:
  • Increasing the availability of Naloxone (opioid antagonist)
  • Closer monitoring of patients
  • Education on multimodal pain therapies
  • Prescription monitoring programs

• Demonstrated an initial decrease in opioid related deaths, but they were not sustained

• A community focused approach like the drop-off boxes tackle this problem from another perspective

• It is likely that a combination of multiple community based interventions is needed to achieve a sustained effect
Limitations

- Retrospective
- Unable to specifically attribute decrease in pediatric deaths to the drop-off boxes
  - Other public health measures were implemented around the same time period
- Population-based data from public sources are likely to have varying levels of quality in the data
- Variations in the accuracy of the investigations surrounding each death
  - There is no widely-accepted specification in what should be included in the National Association of Medical Examiner’s toxicology screen
  - Frequency of routine testing varies throughout jurisdictions, and overdose events are likely missed
  - The analysis likely underestimates the deaths from prescription medications
Conclusions

• Since the passage of the Secure and Responsible Drug Disposal Act in 2010 and the initiation of drug drop-off programs in 2011:
  • **Pediatric death rates in Clark County have significantly decreased without a significant change in the number of narcotics dispensed.**

• Increased implementation and awareness of drop-off programs may be a vital component to combating this nationwide epidemic.

• More research into other community-based interventions are likely needed to generate a sustained decrease in prescription related pediatric deaths.
References


Thank You

Questions