Poisonings and Opportunities for Prevention in Rhode Island

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A competent and efficient medical care system is an essential component of any prosperous society. Rhode Island’s medical providers often take advantage of the clinical expertise at our Regional Center for Poison Control (RCPC) serving Massachusetts and RI, but RCPC’s resources for preventing poisonings remain underutilized. Calls to the RCPC are declining at a time when both emergency department visits and fatalities due to poisoning in RI are increasing.

Rhode Island is currently experiencing a prescription drug poisoning epidemic. Over 14,000 hospitalizations resulted from accidental drug overdoses in Rhode Island between 2005-2009. This sobering statistic tells only half the story; drugs are not the only agents to cause poisonings. Both local data from the RCPC and data collected from the nation’s network of poison control centers show that exposures to non-drug agents account for more than 40% of poison center calls (23,347 of 52,911 in MA and RI; 1,232,413 of 2,759,287 calls nationally in 2010). This study evaluates the public health significance of poisonings in Rhode Island, both with respect to the impacts on health and the opportunities for prevention.

Methods

Populations most vulnerable to poisoning in RI, and agents most commonly involved in human exposures were identified using data from death certificates, emergency department discharges and calls to the RCPC.

Poison Deaths

Poison deaths are those that include poisoning as the underlying cause of death. All causes of death are coded in categories that are part of the International Classification of Diseases tenth revision (ICD-10) based on information provided on the death certificate. Data from 2000-2009 were selected to show trends over time, with 2009 being the latest year for which data were available.

Poison Visits to Emergency Departments

Emergency department records are reported to the Rhode Island Department of Health by hospitals licensed in Rhode Island. All diagnoses are coded in accordance with the ICD ninth revision, clinical modification (ICD-9-CM). Records of persons one to four years of age on the day of the visit with a poison code for any diagnosis were included as cases of poisoning. External causes of injury (Ecodes), also part of ICD-9-CM, are grouped by the first four characters listed and name categories of poisoning for those cases.

Exposure and information calls to the RCPC

The RCPC toll-free call center responds 24/7/365 with translation services available in over 100 languages. Data from calls made from RI in 2011 were used for this analysis. RCPC collects data on the nature of the call (information, human exposure, animal-related), the agent (AAPCC classification of agents), the person exposed (age, gender, severity of exposure), the caller and location (calls from general public or medical provider, exposures at home, work). Data from accredited centers are combined and published annually by the American Association of Poison Control Centers.

Figure 1. Rate of deaths per 100,000 population due to poisoning by year, Rhode Island, 2000-2009.

Figure 2. MARI 2011 Poison Calls.
Table 1. Most Common Categories of poison Ecode (first four digit categories) in Emergency Department persons aged 1 to 4 years, Rhode Island, 2005-2009.

<table>
<thead>
<tr>
<th>Ecode</th>
<th>Freq</th>
<th>%</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E858</td>
<td>430</td>
<td>27.4</td>
<td>Accidental poisoning by other drugs</td>
</tr>
<tr>
<td>E850</td>
<td>208</td>
<td>13.3</td>
<td>Accidental poisoning by analgesics, antipyretics, and antihistamines</td>
</tr>
<tr>
<td>E905</td>
<td>113</td>
<td>7.2</td>
<td>Venomous animals and plants as the cause of poisoning and toxic reaction</td>
</tr>
<tr>
<td>E854</td>
<td>82</td>
<td>5.2</td>
<td>Other psychotropic agents</td>
</tr>
<tr>
<td>E853</td>
<td>72</td>
<td>4.6</td>
<td>By tranquilizers</td>
</tr>
<tr>
<td>E861</td>
<td>62</td>
<td>4.0</td>
<td>Cleansing and polishing agents, disinfectants, paints, &amp; varnishes</td>
</tr>
<tr>
<td>E866</td>
<td>62</td>
<td>4.0</td>
<td>Accidental poisoning by other and unspecified solid and liquids</td>
</tr>
<tr>
<td>E864</td>
<td>57</td>
<td>3.6</td>
<td>Corrosives and caustics</td>
</tr>
<tr>
<td>E869</td>
<td>49</td>
<td>3.1</td>
<td>Accidental poisoning by other gases and vapors</td>
</tr>
<tr>
<td>E865</td>
<td>47</td>
<td>3.0</td>
<td>Foodstuffs and poisonous plants</td>
</tr>
<tr>
<td>E868</td>
<td>47</td>
<td>3.0</td>
<td>Other utility gases and carbon monoxide</td>
</tr>
</tbody>
</table>

RESULTS

Deaths due to poisoning trended upward in the years 2000-2009. Most of these were drug overdose deaths, and the increase was seen in persons aged 45-54 and to a lesser extent, in persons aged 55-64. Only two poisoning deaths in RI were among those aged less than 15 during this ten year period.

In contrast, pre-school children aged one to four years have the highest injury rates due to non-fatal poisonings and comprised nearly ten percent of the visits to Rhode Island emergency departments during the period 2005-2009. Over 40% of exposure calls to poison centers are for children aged one to four. This is the age in which children display hand-to-mouth behaviors that make them vulnerable to poisonings, of which over 85% are associated with ingestion exposures.

Emergency Department discharge data external codes (e-codes) were used to determine the agents responsible for poisonings of children aged one to four years. (Table 1) Drugs, including over-the-counter and prescription medications, accounted for the majority (70%) of poisonings. The classification scheme used by poison centers provides a more detailed description of the agents most commonly associated with poisonings. For non-drug agents, the majority of poisonings fall into a few broad categories that include cosmetics, household cleaners, foreign objects like desiccants and toys like glow sticks, alcohols and pesticides. Figure 2 displays RCPC data for 2011 exposures. Fumes (including carbon monoxide), food products, chemicals, plants, and bites/venoms each accounted for less than five percent of the non-drug calls for 2011 and make up the bulk of the category labeled “other” in Figure 2.

ORIGIN OF CALLS TO THE RCPC

Most of the calls to the RCPC (74%) originate with the general public and can be managed on-site without a visit to a medical facility. This capacity to assist people who would otherwise seek treatment for an exposure is an important element of an effective health care system. The cost savings associated with this service more than justify the modest $200,000 contribution from the RI Department of Health.

About 20% of calls to the RCPC originate from health care facilities and medical offices. Despite this awareness of the Regional Center’s clinical management expertise, the RCPC is still an under-utilized resource for poisoning prevention.

DISCUSSION

PREVENTION OF EXPOSURES

The Regional Center has experience responding to concerns from the public that medical providers may find difficult or impossible to address. For example:

- I’m worried about exposure to West Nile Virus but my skin breaks out when I use products containing DEET. Is there another product I can use that is less irritating?
- I am tortured by bed bugs every night, but I am worried about the chemicals my landlord wants to spray in my apartment.
- Rompi una bombilla. Es peligroso?
- As an employer, I know I need to inform my employees of the potential hazardous chemicals in their workplace, and that the information I provide has to conform to international standards for the new Globally Harmonized system (GHS). Where can I get this safety information?

Answers to these and other questions will be provided by highly trained RCPC specialists by calling 1-800-222-1222. For medical providers who are also employers, the RCPC can provide the information needed to meet Occupational Safety and Health Administration (OSHA) requirements for informing staff of hazards in the workplace.

SUPPORT FOR THE RCPC

RCPC services are free to the general public. Hospitals can access these services as well. Rhode Island’s hospitals place over 1,000 calls to the RCPC each year. The RCPC tries to recoup some of its expenses by sending hospitals invoices based on the level of services the Center has provided that hospital. In 2010, invoices ranged from $2,000 to $38,000, with RI hospitals contributing about 40% of the total invoice amount. This year, contributions from hospitals have fallen to just 13% of the amount invoiced. With cuts to both federal and State funding to the Center, greater support from hospitals is essential to sustain a regional poison center.
REFERENCES


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Disclosure of Financial Interests

The authors and/or their spouses/significant others have no financial interests to disclose.

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