

Unintentional Poisonings

BACKGROUND

National

Unintentional poisoning occurs when a certain amount of a chemical agent is ingested, inhaled, injected or absorbed and unexpectedly causes illness or death. In 2006, unintentional poisonings claimed the lives of 27,531 Americans, and were the second leading cause of unintentional injury deaths following motor vehicle crashes.

However, poisoning deaths exceeded deaths caused by motor vehicle crashes among adults 35 to 54 years of age. Poisoning deaths in this age group increased approximately 113% between 1999 and 2006.¹ Ninety-five percent of unintentional and undetermined poisoning deaths were drug-related. Opioid pain medications were the most common cause, followed by cocaine and heroin. Men were 2.1 times more likely to die from unintentional poisoning than women, and the highest death rates were among Native Americans. The economic cost of poisoning injuries reached \$26 billion in the year 2000.²

Poison control centers across the nation reported approximately two million unintentional poisonings or poison exposure cases in 2006. The National Poison Data System (NPDS) of the American Association of Poison Control Centers logged more than four million poison-related incidents from 61 participating poison control centers in the United States. Approximately 2.4 million cases were concerning human exposure to a chemical substance (8.0 exposures per 1,000 population). The most frequent cause of poison exposure in all individuals was analgesics (pain medications), and in children less than six years of age, poisoning was most commonly caused by cosmetics and personal care products. The NPDS also reported 1,229 fatalities.³

On average, 6,937 human exposure cases were handled by all poison centers in the United States per day. More calls were received during warmer months (7,246 in June) than in the winter months (6,524 in January). Higher volumes of calls were also received between 4:00 p.m. and 11:00 p.m. with 93% of poisonings occurring at a place of residence.³

Oklahoma

Between 2000 and 2006, unintentional poisoning deaths increased by 144% in the State of Oklahoma. Unintentional poisoning has become the second leading cause of unintentional injury death among all ages resulting in over 54,000 years of potential life lost before the age of 65. Seventy percent of unintentional poison-related deaths occurred among persons 30 to 54 years of age with the greatest mortality occurring among persons 40 to 49 years of age. Children birth to 14 years of age had the lowest number of deaths associated with unintentional poisonings.¹

Over two thousand persons in Oklahoma died from unintentional poisoning during this time. More men (62%) died from unintentional poisonings than women (38%), and racial groups which were most affected by unintentional poisoning deaths were whites (9.7 per 100,000 population), Native Americans (9.1 per 100,000), and African Americans/blacks (5.8 per 100,000).^{1,4}

Oklahoma hospitals reported over 6,000 hospital discharges associated with poison exposure from 2002 to 2006. The majority of discharges were among children one to four years of age and adults 40 to 49 years of age.⁵

The Oklahoma Medical Examiner's Office reported 487 unintentional drug-related poison deaths in Oklahoma in 2006. More men (300 persons) died

from unintentional drug poisonings than women (187 persons) and the highest rate of deaths occurred among whites (12.3 per 100,000), Native Americans (0.8 per 100,000) and African Americans/blacks (0.8 per 100,000). Approximately 60% of persons were 40 to 59 years of age, and 34% were between the ages of 20 and 39. Fifty percent of deaths were unintentional poisonings associated with a single drug (methadone, cocaine, and fentanyl resulted in the most deaths), and 241 were multiple drugs deaths.⁶

Carbon Monoxide Poisoning

During the winter storm in January 2007, 66 persons were treated at a hospital for carbon monoxide (CO) poisoning, and 96% of these injuries occurred in a home. CO poisonings had the second highest hospitalization rate of all winter storm-related injuries.⁷ CO poisoning occurs when carbon monoxide, an odorless, colorless, poisonous gas, is inhaled in significant concentrations causing illness and/or death. It is commonly reported after major power outages resulting from natural or man-made disasters. When alternative sources of fuel or electricity are used for heating, cooling, or cooking during these events, CO can build up quickly in enclosed or partially enclosed areas.⁸ During a subsequent winter storm in December 2007, two persons died from CO poisoning caused by a generator.

Oklahoma Poison Control Center

The Oklahoma Poison Control Center was founded in the 1960's. In 1962, the center answered about 500 poison calls; today, the center answers over 50,000 phone calls a year and includes a 24-hour, toll-free telephone service. The poison center staffs specially trained licensed pharmacists and nurses who provide emergency poisoning management advice to Oklahoma residents and health care professionals. The center provides information concerning the prevention and management of potentially toxic exposures to the people of Oklahoma. The center's goal is to save lives as

well as to provide a cost-effective service to patients and residents by promoting the appropriate use of health care resources. The Oklahoma Poison Control Center is a certified poison center as independently evaluated by the American Association of Poison Control Centers. Maintaining funding of poison centers enables more poisoning cases to be safely managed at home, decreasing the need for emergency department treatment.⁹

The Oklahoma Poison Control Center received 54,178 calls in 2007. Of the 37,381 human exposure cases, 14,276 were drug-related poisonings. Children under five years of age accounted for 56% of all poisoning cases. Analgesics (pain medications), cosmetics/personal care products, and household cleaning substances were the leading causes of poison exposure among all Oklahomans. Substances most commonly involved in adult exposures include analgesics, sedatives/hypnotics/antipsychotics, and household cleaning products. Among Oklahoma's children, cosmetics/personal care products, household cleaning products, and analgesics were the most frequent cause.⁹

PROGRESS

Prescription Drug Use

The Injury Prevention Service (IPS) is preparing a manuscript on unintentional prescription drug poisoning deaths in Oklahoma, *Unintentional Medication Overdose Deaths – Oklahoma, 1994-2006*. Preliminary results show that Oklahoma is one of the states leading the nation in the rate of prescription drug overdose deaths (11.8 per 100,000 population), and this rate continues to increase. Inappropriate use of legal prescription opioid painkillers, particularly methadone, is a primary contributor to these deaths. An increasing proportion of deaths are from oxycodone and hydrocodone. Most persons who die from unintentional prescription drug

overdoses are middle-aged adults, and tend to be white males. However, deaths among females are rising at a faster rate than among males.

Persons 35 to 44 years of age have the highest medication overdose death rates (11.4 per 100,000) followed by persons 45 to 54 years of age (10.7 per 100,000). Methadone, hydrocodone, alprazolam, oxycodone, and morphine were the most common substances involved in unintentional medication overdose deaths and accounted for half of all deaths. Alcohol, narcotics, and anti-anxiety medications accounted for three-fourths of all overdose deaths.

Many prescription drug deaths can be attributed to poly-substance ingestion – the ingestion of multiple medications at the same time. With poly-substance ingestion, levels of any one of the substances may not be fatal; however, consuming multiple medications concurrently or combining them with alcohol or illicit drugs can be lethal.

The IPS initiated a surveillance system for unintentional poisoning deaths among Oklahoma residents in December 2008. The system utilizes medical examiner data and crosschecks Vital Statistics data, gathering as much detailed information on deaths as possible. Data will be used in developing reports, collaborating with other interested groups, and potential data linking to other sources such as the Oklahoma Prescription Monitoring Program (PMP).

Funding

Currently, the IPS does not have specific funding to address unintentional poisoning deaths.

Publications

Peer-Reviewed Publications

- The association of pseudoephedrine sales restrictions on emergency department urine drug screen results in Oklahoma. *J Okla State Med Assoc*, Nov 2007;100(11):436-439.

- Unintentional medication overdose deaths – Oklahoma, 1994-2006 (Pending)

Summary Data Reports

- Injuries in Oklahoma, 2004
- Injuries in Oklahoma, 2005
- Injuries in Oklahoma, 2004-2006

Injury Update Reports

- Undetermined Manner Drug Poisoning Deaths, Oklahoma, 2004-2006

Fact Sheets

- Carbon Monoxide Poisoning Deaths
- Unintentional Carbon Monoxide Poisoning Deaths

Education and Planning Materials

- Injury Prevention Works: Strategies for Building Safe Communities

Collaboration

In March 2009, the Oklahoma State Department of Health and the Oklahoma Poison Control Center hosted an Unintentional Poisoning Deaths Symposium. The purpose of the symposium was to initiate a collaborative effort among agencies and organizations statewide to assess unintentional poisoning deaths in Oklahoma due to prescription drug use, identify probable solutions, and develop a plan of action and a timeline.

Presentations and discussions related to unintentional poisoning deaths, specifically pertaining to prescription drug use among 35 to 54 years of age in Oklahoma, were conducted.

The symposium served as an avenue in bringing different agencies and organizations together to discuss current local and statewide injury trends and existing injury projects. It provided a forum for community partners to discuss prevention strategies and strengthen efforts by fostering opportunities to collaborate on effective strategies and link resources among agencies

and organizations statewide. These agencies and organizations provided pertinent information and valuable insight on unintentional poisoning death trends which will support future injury prevention efforts in the state.

GOALS/OBJECTIVES

Goals

- Increase awareness of unintentional poisonings.
- Enhance data and knowledge about poison exposures and circumstances of the events.
- Capitalize on partnerships formed in the unintentional poisoning symposium to strengthen prevention efforts associated with unintentional drug poisoning deaths.
- Increase the use of evidence-based injury and violence prevention interventions statewide.

Objectives

- Identify characteristics and demographics of target/at-risk populations by 2010.
- Educate prescribers, pharmacists, physicians and other medical professionals on the proper use of prescription drugs, the Prescription Monitoring Program, and the use and availability of community resources for patient referrals through 2015.

- Educate parents and persons in at-risk populations through 2015.
- Reduce deaths caused by unintentional poisonings to 12.1 deaths per 100,000 population by 2015.
Baseline: 2006 CDC WISQARS data for Oklahoma: unintentional poisoning=13.4 per 100,000 population.

ACTION PLAN

- Work with medical licensing entities to distribute Prescription Monitoring Program information with licensure renewal letters to increase awareness of program availability through 2015.
- Promote linking Medical Examiner data with Prescription Monitoring Program data through 2015.
- Work with Medicaid to encourage or require physicians to check the Prescription Monitoring Program every 3 months on every patient through 2015.
- Communicate progress and share information among unintentional poisoning taskforce members through 2015.
- Assist with preparing educational information to present to graduate schools (medicine, pharmacy, nursing, dentistry, etc) through 2015.

REFERENCES

¹Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Report System (WISQARS) [online]. (2005). Retrieved 25 August 2008, from: <http://www.cdc.gov/ncipc/wisqars>.

²Centers for Disease Control and Prevention. Poisoning in the United States: Fact Sheet. Retrieved 8 August 2008, from: <http://www.cdc.gov/ncipc/factsheets/poisoning.htm>.

³American Association of Poison Control Centers. 2006 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS). Retrieved 22 September 2008, from: <http://www.aapcc.org/archive/Annual%20Reports/06Report/2006%20Annual%20Report%20Final.pdf>.

⁴Vital Records Division, Oklahoma State Department of Health. Vital Statistic Mortality Database.

⁵Health Care Information Division, Oklahoma State Department of Health. Oklahoma Inpatient Discharge Database.

⁶Office of the Chief Medical Examiner, State of Oklahoma. Office of the Chief Medical Examiner Annual Report: 2006 January 1-December 31, State of Oklahoma. Retrieved 22 September 2008, from: http://www.ocme.state.ok.us/2006_annualreport.pdf.

⁷Piercefield, E. Winter storm-related injuries, Oklahoma, 2007. Retrieved 29 October 2008, from: Injury Prevention Service, Oklahoma State Department of Health.

⁸Centers for Disease Control and Prevention. Carbon monoxide poisoning after a disaster. Retrieved 28 October 2008, from: <http://www.bt.cdc.gov/disasters/carbonmonoxide.asp>.

⁹Oklahoma Poison Control Center. Poisoning Statistics - 2007. Retrieved 22 September 2008, from: <http://www.oklahomapoison.org/facts/>.