Introduction

The rate of opioid overdose has more than tripled in the United States since 1990. In particular, deaths from prescription opioid overdose now outnumber deaths from heroin and cocaine combined, and exceed the number of deaths caused by motor vehicle accidents in 29 states. Nevada is the 4th leading state in opioid overdose-related deaths, with an 80% increase in mortality rates from 1999 to 2010 (11.5/100,000 to 20.7/100,000, respectively). This alarming trend highlights a dire need for interventions that both address opioid misuse, as well as reduce the risk of overdose-related deaths.

Several states have implemented programs and policy changes in attempts to combat the growing opioid misuse problem. Some have expanded the protection of “Good Samaritan” laws to include non-professional third parties in addition to physicians and first responders, which has proven to reduce overall drug-related mortality in general. More specifically, rescue drug laws are showing promise not only in reducing opioid-overdose deaths, but also in decreasing relative accrued costs for inpatient treatment, while increasing public awareness and accurate identification of opioid misuse and overdose.

The current preferred method of treatment for opioid overdose reversal is the administration of an opioid antagonist, Naloxone. When administered appropriately, the drug is highly efficacious; however, its action is time-dependent. Though Naloxone (more commonly called Narcan is not a controlled substance, its use has been largely regulated by laws that preclude the opioid epidemic. Until recently, its distribution has been limited to emergency departments and medical first response teams, creating unnecessary barriers to the treatment of life-threatening overdoses. There are multiple and multifaceted reasons one might not receive emergency treatment within the critical window. Most simply, distance from services and lack of access to communication devices are not uncommon. Perhaps more pertinent are bystander or user fears of police involvement, high medical costs, and community stigma.

Drug rescue programs allow Naloxone to be administered by non-professionals outside of hospitals and first-response teams. These programs include educational components such as accurate identification of opioid overdose, CPR training, instructions for appropriate Naloxone administration (including potential for a second dose), and protocol for seeking subsequent medical care. They reach both opioid users, as well as family and friends of users, and individuals living in areas where overdose is common. Thus, drug rescue programs have the potential to overcome the majority of factors contributing to opioid-related overdose deaths.

Methods

A literature search was performed for Naloxone efficacy in treatment of opioid overdose. PubMed was searched for studies limited to English. Search terms used were opioid overdose prevention, naloxone, opioid overdose AND naloxone, Opioid overdose mortality. Some specific statistics were gathered from the CDC and Trust for America’s Health using a google search. The institution of opioid intervention programs are still in their early stages and there are ethical constraints regarding clinical trials and thus a lack of abundant representative data, specifically, randomly controlled trials. In order to find sufficient evidence of Naloxone outcomes, our search was broadened to include not only systematic reviews but also pilot studies and survey reviews. Because all articles used reviewed the outcomes of opioid overdose prevention programs, they were appropriate for our research question.

Results

The Effects of Naloxone Rescue Programs on Opioid-Overdose Outcomes

Sara Coffee, Erin Hall, Stephanie Rogers
University of Nevada School of Medicine

**OOPD effectiveness in reducing Opioid Overdose Mortality**

**Costs of Heroin Overdose**

**Overdose Education and Naloxone Distribution – Overdose Reversals**

**Future Direction**

Traditionally, opioid overdose treatment has been provided by medical first responders and given in the emergency department. The challenges in this model of treatment include the high rates of non-reporting and accessing of emergency medical services. This year marks the 20th anniversary of the overdose clearsky point to the need for a more novel model of prevention and treatment. Many states and communities have recognized this need and have established programs to distribute naloxone, the most common treatment for opioid overdose, to lay people and opioid users. States without programs continue to have some of the highest opioid mortality rates. Our recommendation moving forward would be to establish naloxone distribution programs in states and communities where they don’t exist. This model of treatment works very well when you consider that overdose in drug users is very common, is often witnessed by peers and family members and timely administration of naloxone can prevent mortality and morbidity. Studies have shown that administration of naloxone by peers and family members is successful and they are willing to provide intervention.

To support the establishment and expansion of naloxone distribution programs we recommend the passage of Good Samaritan laws in states where they don’t currently exist. All of this protection has been shown to be a barrier to overdose reporting. Research also suggests that lack of Good Samaritan laws impacts whether people and family members of the victim administer naloxone and how likely they are to seek medical help. Therefore, we recommend expanding Good Samaritan laws within states where distribution programs exist.

We also recommend that future recommendations based on descriptive reasoning and good practice principles, however their analysis was either coarse, the scope of the project or there was insufficient research to report. OOPD programs should include an education component consisting of training for recognizing the signs and symptoms of opioid overdose, how to administer naloxone, and basic life support techniques including CPR and instructions for obtaining appropriate follow-up care. We would recommend that the intranasal form of naloxone be used in this method has shown to be safe, effective and easily administered by a lay-person. Other benefits of this form are the dilute form of the dose, passive site effect profile and reduced risk of needle-stick injury. An injectable form of naloxone was recently approved by the FDA, but long-term adverse effects profiles are not yet available.

Finally, we would also recommend overdose education at the time prescriptions are given. In recent years drug misuse more commonly involves prescription opioids. We believe this would be another level at which outreach occurs.

**Limitations**

- Several studies focused on overdose and non-harm reduction only, excluding opioid medications
- Several study results were gathered from surveying opioid users and program employees which can lead to underestimated data due to loss of follow-up and/or collection errors.
- Lack of high level research evidence
- Lack of updated data such as vital statistics
- Comparison of programs is difficult due to differences in states law, difference in program implementation and sheer number of programs
- Not all opioid overdose result in death, suggesting that opioid reversals were not all “life-saving” treatments and could be attributed more efficacy to naloxone than what truly exists.

**Resources**

- http://www.cdc.gov/drugoverdose/data/overdose.html

**Clarifications**

**Opiates**

- Includes both opiume, a natural derivative of opium such as morphine and codeine, and related synthetic and semi-synthetic compounds that act at the opioid receptor (mu-receptor). Includes but is not limited to: hydrocodone (Hycodan), oxycodone (OxyContin), percocet, heroin and methadone.

**Opioid Overdose**

- Occurs when opioid binds the mu receptors in the brain causing them to become desensitized to Carbon dioxide levels in the blood which leads to depressed respiration and can ultimately lead to death.

**Naloxone**

- Opioid antagonist that outcompetes opioids for the mu receptor thus inhibiting the effects opioids have on the brainstem and respiration. The primary route of naloxone is intravenous (IV) but is now to be administered via a nasal spray (Narcan) which is the preferred method of administration in non-medically trained individuals.

**Pharmaceuticals**

- Includes both opiume, a natural derivative of opium such as morphine and codeine, and related synthetic and semi-synthetic compounds that act at the opioid receptor (mu-receptor). Includes but is not limited to: hydrocodone (Hycodan), oxycodone (OxyContin), percocet, heroin and methadone.