

INTRODUCTION

- In 2009 ACMT established the Toxicology Investigators Consortium (Toxic) and its associated case database
 - This database enables the nationwide collection of relevant toxicological data from patients seen at the bedside by trained toxicologists.
- Prescription drug abuse is the fastest growing drug problem in the United States¹
 - An increasing number of prescription medications present in the home increases the risk for unintentional pediatric ingestion²

OBJECTIVES

- Primary objective:** We used the Toxic database to investigate characteristics of pediatric patients receiving naloxone over one year.
 - ✓ Characteristics of patients
 - ✓ Xenobiotic implicated
 - ✓ Reason for administration of naloxone

METHODS

- Retrospective review of the Toxic database for all cases of patients who received naloxone from October 1, 2012 to September 30, 2013
- Patients ages 18 years and younger were examined and divided in four age groups:
 - < 2 years, 2-6 years, 7-12 years and 13-18 years.
- Patients were evaluated for sex, indication for naloxone administration, and specific xenobiotic implicated
- Descriptive statistics were used

RESULTS

- Sixty eight (68) patients received naloxone during the study period
 - 14 (20.6%) were age <2 years
 - 17 (25.0%) were age 2-6 years
 - 4 (5.9%) were age 7-12 years
 - 33 (48.5%) were age 13-18 years
- The number of males were greater than females in all groups except the 7-12 year group (males=females).
- Unintentional pharmacologic exposure was highly associated with receiving naloxone in all age group except the 13-18 year group.
- A majority of patients in all groups received naloxone for coma and/or respiratory depression
- Overall the most common xenobiotics associated with naloxone administration were buprenorphine for the less than 2 years age group, clonidine for the 2-6 years and 7-12 years age group, and hydrocodone in the 13-18 year age group

Age <2 years n=14		Buprenorphine	42.9%	Unintentional	85.7%
		Clonidine	14.3%	Intentional	14.3%
		Morphine	21.4%		
Male	64.3%	Oxycontin	14.3%	Coma	76.5%
Female	35.7%	Opioid	7.1%	Unknown	23.5%

Age 2-6 n=17		Clonidine	29.41%	Unintentional	88.2%
		Other	23.53%	Intentional	5.9%
		Buprenorphine	17.65%	Unknown	5.9%
		Oxycodone SR	11.76%		
Male	70.6%	Codeine	5.88%	Coma	76.5%
Female	29.4%	Methadone	5.88%	Unknown	23.5%
		Oxymorphone	5.88%		

Age 7-12 n=4		Clonidine	50.0%	Unintentional	50.0%
Male	50.0%	Methadone	25.0%	Intentional	50.0%
Female	50.0%	Morphine	25.0%	Coma	100.0%

Age 13-18 n=33		Other	30.30%	Intentional	78.8%
		Hydrocodone	15.15%	Prescription Drug Abuse	15.2%
		Clonidine	12.12%	Drug Abuse	6.1%
		Unknown	9.09%	Unintentional	0.0%
		Oxycodone	6.06%		
		Codeine	6.06%	Coma	60.6%
		Morphine	6.06%	Unknown	33.3%
		Buprenorphine/Naloxone	3.03%	Bradycardia	6.1%
		Heroin	3.03%		
Male	60.6%	Heroin	3.03%		
Female	39.4%	Methadone	3.03%		
		Fentanyl	3.03%		

DISCUSSION

- A study by Burghardt et al. showed that Adult medication prescriptions were significantly associated with exposures in children of all ages, with the strongest association observed for opioids³
- Another study showed that from the year 2000 to the year 2010 there was a 33% increase in pharmaceutical-related exposures in children younger than 6 years and a 2.8% decline in the number of nonpharmaceutical-related exposures which was related to a 53% increase in serious medical outcomes⁴
- Buprenorphine is a drug that is primarily used in the treatment of opioid addiction
 - Increasingly prescribed
- Some believe that buprenorphine has less respiratory and mental status depression than other opioids because it is a partial μ -agonist
- In our study the use of naloxone to rescue buprenorphine poisoned pediatric patients from coma
 - This signifies that serious medical outcomes in pediatric patients is resulting from buprenorphine exposure.
 - It is unknown how the patients clinically responded to naloxone in this study
- The use of hydrocodone in the teenage population (age 13-18 year old) is consistent with national trends in both opioid prescribing and prescription opioid abuse
 - This suggests that the 13-18 year old age group is using opioids for recreational purposes

CONCLUSIONS

- The Toxic database shows that naloxone use in children is mostly due to unintentional pharmacologic exposures
- Coma is the most common reason patients received naloxone in all age groups
- Naloxone administration in males outnumbered females in all age groups
- Buprenorphine and clonidine were the predominant xenobiotics implicated in the age groups from 12 years and younger, while hydrocodone was the predominant xenobiotic in the older age groups.
- Pediatric buprenorphine exposures are associated with the administration of naloxone. However, this study is limited because we are unable determine if naloxone administration was warranted as well as what the clinical effects of administration were.

REFERENCES

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