

# A Review on Management of Drug and Chemical Poisoning in Single Hospital in Saudi Arabia

Abdullah Ahmed Alzahrani\*, Abdulaziz Yhya Asiri

Department of Ministry and Human Resources, Brunel University, London, UK

## Mini Review

**Received:** 12-Feb-2024, Manuscript No. JPPS-24-127360; **Editor**

**assigned:** 15-Feb-2024, Pre QC No. JPPS-24-127360 (PQ); **Reviewed:** 29-Feb-2024, QC No. JPPS-24-127360;

**Revised:** 07-Mar-2024, Manuscript No. JPPS-24-127360 (R); **Published:** 14-Mar-2024,

DOI: 10.4172/2320-1215.13.1.001

**\*For Correspondence:**

Abdullah Ahmed Alzahrani,  
Department of Ministry and Human Resources, Brunel University,  
London, UK

**E-mail:** Aalzahrani257@moh.gov.sa

**Citation:** Alzahrani AA, et al. A Review on Management of Drug and Chemical Poisoning in Single Hospital in Saudi Arabia.

RRJ Pharm Pharm Sci. 2024;13:001

**Copyright:** © 2024 Alzahrani AA, et al.

This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original

## ABSTRACT

Pediatric poisoning is a common medical emergencies worldwide that leads to morbidity and mortality. Medications and chemical substances were the leading cause of poisoning. Yet limited research exists on this issue in Saudi Arabia. The chart related to retrospective study has been done for all acute pediatric poisoning cases in children those who are admitted in department of emergency of East Jeddah Hospital. From those departments very less data was obtained and analyzed for different characteristics like demography, poisoning type, and how they have managed to overcome the condition. During the procedure, nearly 69 pediatric poisoning cases whose condition is at acute stage are admitted in the emergency room at East Jeddah Hospital. Among all the cases, majorly male cases were highly affected than females' cases and also the age of the affected patients was just below 5. Unintentional poisoning occurrence was more common than the intentional poisonings. This further lead to the importance of parental supervision and how preventive measures are considered. Along with this, the intake of excessive drug dosage of medicines prescribed lead to poisoning and medicines like Analgesics such as paracetamol is the most included drug classification associated with poisoning which was followed by anticonvulsants and other central nervous system acting medicines are observed. This review study underscores the burden of pediatric poisoning and the condition is acute in Saudi Arabia, with implications for public health interventions and preventive strategies. Our review involves the necessity to understand the how frequently the drug should be prescribed and given to the patients, how we are managed to cure the poisoning, and adverse effects of pediatric poisoning patients

author and source are credited.

whatever they faced during the treatment procedure their intervention and preventive measures we took during the treatment procedure.

The study was evaluated for the frequency and management of pediatric poisoning cases in the emergency department of East Jeddah Hospital, Saudi Arabia, over a 3.5-year period.

**Keywords:** Poisoning; Emergency admission; Analgesics, Paracetamol, Anti-histamines, Anti-inflammatory drugs; Drug overload; Prescription; Management; Prevention; Anti dotes

## INTRODUCTION

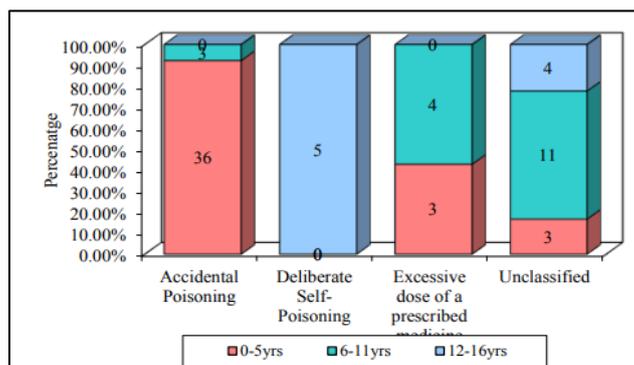
Acute poisoning is the ingestion of a toxic substance in a single exposure or over a short period of time, if left untreated it can be life-threatening. It was one of the challenging global health concerns, particularly affecting children under five years old <sup>[1]</sup>. Children are particularly vulnerable to acute poisoning because they are more likely to explore their environment by putting things in their mouths. The incidence of unintentional poisoning, primarily through oral ingestion, presents significant risks of morbidity and mortality. Reports from organizations like the World Health Organization (WHO) and the American Association of Poison Control Center (AAPCC) highlight the magnitude of this issue, with millions of children affected annually. In Saudi Arabia, limited studies exist, but findings from previous studies underscores the prevalence of pediatric poisoning cases. Understanding the epidemiology, causative agents, and outcomes of pediatric poisoning is vital for implementing effective preventive measures and management strategies <sup>[2]</sup>.

## LITERATURE REVIEW

Our study mainly pointed to determine how frequently poisoning is caused and how the physicians are managed to cure acute pediatric poisoning in East Jeddah Hospital in Jeddah city, Saudi Arabia <sup>[3,4]</sup>. The objectives of the study involves identification of the type of poison taken by the individual; What are the outcomes involved in poisoning? The type of antidote prescribed for the poisoning; to note the adverse effects that patients face during the procedure. This study employed a chart review of retrospective procedure of all pediatric poisoning acute cases who are admitted in the emergency department of East Jeddah Hospital in Jeddah city, Saudi Arabia from 2016 October to 2020 March, and the study involved patients who are under 16 years and below <sup>[5,6]</sup>. Whatever the data which was isolated we have managed to make into a sheet called Data Collection Sheet (DCS) from patients which is nothing but a electronic medical reports by our two general physicians and two pharmacists within the emergency department. This data collection sheet contains patients essential information such as demography, the medication history, address and type of poisoning, mode of intoxication, symptoms, medical interventions, antidotes given to the patient, and adverse events or side effects occurred during the treatment procedure <sup>[7]</sup>.

The total cases of acute poisoning cases demographic profile revealed that the poisoning rate was high in boys than girls. The majority cases involves children, additionally, these citizens are only from Saudi Arabia. The occurrence was primarily caused from home, which is unintentional. In some cases, the study stated that primary cause of poisoning was due to excessive dose intake of prescribed medications. The association between the pattern of poisoning and age groups was statistically significant a 5% level of significance. Medications, particularly such as analgesics and antipyretics like paracetamol intake was observed in the majority poisoning cases <sup>[8]</sup>. Then along with the above, the cases were observed for intake of anticonvulsants/CNS acting medicines, antipsychotics, cardiovascular medicines and one incidence of poisoning by antihistamines and intoxication (Figure 1).

Figure 1. Patterns of poisoning incidences according to causes of toxicity.



Chemical substances, including heavy metals, were other causes of poisoning. Most poisonings occurred at home, with oral ingestion being the primary route followed by local, IV, and inhalation [9].

Agents causing acute poisoning: Analgesics/Antipyretics>Anticonvulsants/CNS drugs>Antipsychotic>Antihistamines>Antihistamines>Chemical substances>Heavy metals organic and hydrocarbon compound>Organophosphate>Alcohol/Methanol>Unknown

Furthermore, the treatment procedure involved antidotes for the administered chemical substances with activated charcoal N-acetylcysteine usage. Then N-acetyl histamine is also given few cases. Patients experiencing sensitive reactions were administered with Anti-histamines.

The order of antidotes administered to treat acute poisoning in children was activated charcoal >N-Acetylcysteine>Antihistamine>Naloxone>Atropine>Fomepizole.

Following this method, the maximum number of the children recovered with treatment who were admitted to the pediatric ward. For further care, very few were admitted for Pediatric Intensive Care Unit. The route administration involved oral, local, inhalation and IV infusion as per the values mentioned in the (Figures 2 and 3) [10].

Figure 2. Distribution of children by site, types of poisons and route of intoxication.

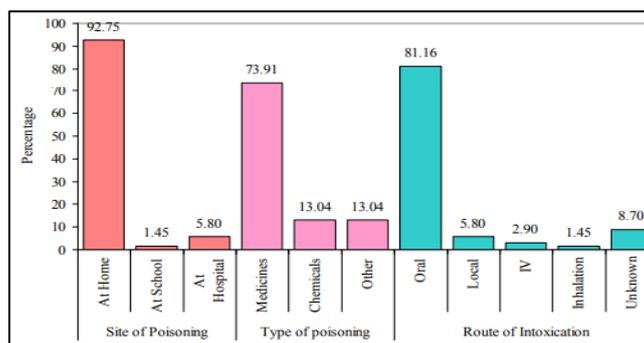
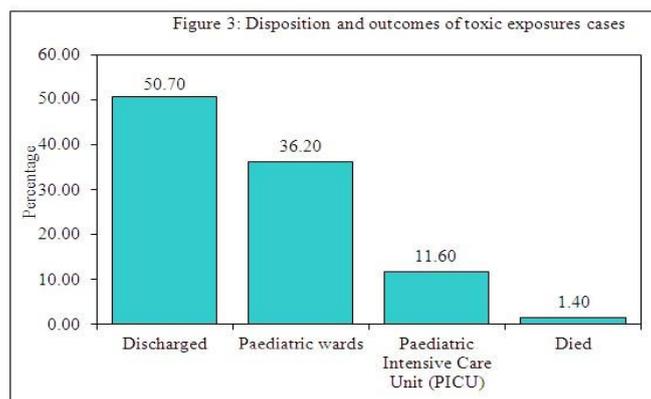


Figure 3. Disposition and outcomes of toxic exposures cases.



## DISCUSSION

As per the conducted retrospective study, the 69 cases of acute poisoning were admitted in the emergency department at one Hospital in Jeddah, Saudi Arabia for over ~3.5 years. They stated that acute pediatric poisoning was being a major health concern in the society. But still there was no proper epidemiological procedure for the treatment of poisoning in the Kingdom of Saudi Arabia till date, many studies have been published in different regions and also stated that children who are younger than 5 years of age are mostly affected. This incidental poisoning occurred at home, in males, who are mostly at risk. Some revealed unintentional poisoning and some revealed intentional.

Of note, attempted suicide is a criminal act in Saudi Arabia. Social stigmatization associated with psychiatric illness and their medications is another issue both may play a role in under-reporting of attempted intentional poisoning [11-13]. The unintentional poisoning involves where the children are somewhat curious to do what the elders used to, which is completely comes under natural tendency to explore the environment, and another reason would be lack of awareness on the risk factors in the surrounding area that they grew. Parents, care takers who ever involved must be responsible for these type of incidences. When it comes to cases of under age 5, the selection of medicines, safely storing household supplies and educating young children about potential risk was necessary [14,15]. If the poisoning was intentional then usually affected adolescents, they are considered as suicidal. The intake of medicines played a common cause for poisoning in most of incidents. According to the Annual Report of AAPCC (2018) National Poison Data System (NPDS) the top five most common exposures in children age 5 years or less were cosmetics and personal care products followed by household cleaning substances and medicines [16,17].

The medications involve specifically non-steroidal anti-inflammatory drugs, analgesics, pharmaceutical products, anti-convulsants and anti-psychotics. The medicines categorized under neuronal system, were the one of the most common drugs causing poisoning in children. The treatment of poisoning cases in pediatric cases depends on several factors such as the type of poison, the dose, clinical symptoms, and age, presence of other disorders, ancestral disorders/surgeries undergone previously or any injuries, and the duration of poisoning exposure [18,19].

The antidotes isolation for different conditions and were given in hospital. This treatment procedure involves decontamination with active charcoal and medicines N-acetylcysteine such as carbamazepine, phenobarbital, theophylline, salicylates, and valproic acid of the cases. Activated charcoal helps in decreasing the absorption of chemical in stomach and intestine for a wide variety of toxins. N-acetylcysteine is being used as an antidote for paracetamol poisoning. We got to know that the clinical severity of poisoning incidents in this study is higher than what is reported in similar research [20,21]. Also another reason for childhood poisoning was lack of parental supervision. If these drugs are kept out of reach to the children play area which would be a better option, if not that would be high risk for the child. Hence, to keep these materials in a safe, out of reach to child is highly important. One of the World Health Organization reports revealed that an estimated 193,460 deaths were caused annually because of unintentional poisoning worldwide of which 84% occurred in low and middle-income countries [22]. Educating the community and particularly parents about the risks of drugs and chemicals poisoning in children may reduce the occurrence of such harmful adverse events as per the chart of Figure 1 [23].

## CONCLUSION

Finally, we conclude that this review states that acute pediatric poisoning is one of the significant global challenges, with medications being a common source. The antidotes choosing for the treatment is also necessary for the treatment of these type of conditions along with the thorough knowledge on pharmaceutical drugs usage and creating awareness in the people is also necessary. Along with the dose specificity is challenging because there are

children under 5-10 years of age. It highlights that understanding of the characteristics, patterns, management of poisoning incidents was crucial for effective prevention and treatment and need for comprehensive epidemiological studies and standardized guidelines for managing pediatric poisoning in Saudi Arabia is highly necessary. Community education initiatives targeting parents and caregivers are imperative to mitigate the risks associated with unintentional poisoning and reduce the burden on healthcare facilities ultimately ensuring the safety and well-being of children especially in Saudi Arabia.

## REFERENCES

1. Lee J, et al. Clinical spectrum of acute poisoning in children admitted to the pediatric emergency department. *Pediatr Neonatol*. 2019;60:59-67.
2. Qazi M, et al. Clinical profile and outcome of children presenting with poisoning or intoxication: a hospital-based study. *Int Journal Contem Pediatr*. 2018;5:1844.
3. Ahmed A, et al. Poisoning emergency visits among children: a 3-year retrospective study in Qatar. *BMC Pediatr*. 2015;15:104.
4. Mintegi S, et al. Emergency visits for childhood poisoning: a 2-year prospective multicenter survey in Spain. *Pediatr Emerg Care*. 2006;22:334-338.
5. Global Health Estimates 2013, 2014. Deaths by Cause, Age and Sex, Estimates for 2000–2012. World Health Organization, Geneva. Available at.
6. Mowry JB, et al. 2015 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 33rd Annual Report. *Clin Toxicol (Phila)*. 2016;54:924-1109.
7. Izuora GI, et al. A seven-year review of accidental poisoning in children at a military hospital in Hafr Al Batin, Saudi Arabia. *Ann Saudi Med*. 2001;21:13-15.
8. Alghadeer S, et al. The patterns of children poisoning cases in community teaching hospital in Riyadh, Saudi Arabia. *Saudi Pharm J*. 2018;26:93-97.
9. Alruwaili ND, et al. An epidemiological snapshot of toxicological exposure in children 12 years of age and younger in Riyadh. *Ann Saudi Med*. 2019;39:229-235.
10. Hoy JL, et al. Unintentional poisoning hospitalisations among young children in Victoria. *Inj Prev*. 1999;5:31-35.
11. Al-Shehri M. Pattern of childhood poisoning in Abha City-Southwestern Saudi Arabia. *J Family Community Med*. 2004;11:59-63.
12. OM Al Madni, et al. Hanging deaths in Dammam, Kingdom of Saudi Arabia. *J Forensic Leg Med*. 2010;17:265-268.
13. Tobaigy M, et al. Views of parents and pharmacists following participation in a paediatric pharmacovigilance study. *Pharm World Sci*. 2010;32:334-338.
14. Mutlu M. et al. Pattern of pediatric poisoning in the east Karadeniz region between 2002–2006: increased suicide poisoning. *Hum Exp Toxicol*. 2010; 29:131-136.
15. Sharif F, et al. Poisoning in a paediatric hospital. *Ir J Med Sci*. 2003;172:78-80.
16. Lee C, et al. Demographic and clinical characteristics of hospitalised unintentional poisoning in Aboriginal and non-Aboriginal preschool children in New South Wales, Australia: a population data linkage study. *BMJ Open*. 2019;9:e022633.
17. Abd-Elhaleem ZAE, et al. Pattern of acute poisoning in Al Majmaah Region, Saudi Arabia. *Am J Clin Exp Med*. 2014;4:79-85.

18. Reith DM, et al. Childhood poisoning in Queensland: an analysis of presentation and admission rates. *J Paediatr Child Health*. 2001;37:446-450.
19. Azab SM, et al. Epidemiology of acute poisoning in children presenting to the poisoning treatment center at Ain Shams University in Cairo, Egypt, 2009-2013. *Clin Toxicol (Phila)*. 2016;54:20-26.
20. Barry JD. Diagnosis and management of the poisoned child. *Pediatr Ann*. 2005;34:937-946.
21. Christophersen AB, et al. Activated charcoal alone or after gastric lavage: a simulated large paracetamol intoxication. *Br J Clin Pharmacol*. 2002;53:312-317.
22. Dayasiri MBKC, et al. Risk factors for acute unintentional poisoning among children aged 1-5 years in the rural community of Sri Lanka. *Int J Pediatr*. 2017;2017:4375987.
23. Schmertmann M, et al. Risk factors for unintentional poisoning in children aged 1-3 years in NSW Australia: a case- control study. *BMC Pediatr*. 2013;13:88.