

Childhood Poisoning Cases Admitted to Zagazig University Hospitals during the Year 2018: A Retrospective Study

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Abstract

Background: Childhood poisoning is considered major socioeconomic and public health problem as there are thousands of children admitted to the emergency departments and millions of calls are made to poison control centers every year. **Aim of the Work:** Determine the prevalence and pattern of childhood poisoning cases admitted to Zagazig University hospitals. **Subjects and Methods:** This is a retrospective study on children < 18 years old presented to Zagazig University hospital emergency department. The study was done from the beginning of January 2018 to the end of December 2018 on total of 624 cases with acute poisoning. All required epidemiological and clinical data were collected and analyzed. **Results:** A total of 624 childhood poisoning cases, more males than females (55.3% versus 44.7% respectively), and more in age group of 3 - 6 years old (40.86%), more in rural than urban communities (65.06% against 34.94% respectively). Oral exposure was the most against other routes (84.94%). Most cases were unintentional (92.8%). The prevalence of childhood poisoning in descending order was; compound therapeutic medications (32.69%) followed by pesticides (26.92%) then corrosives (17.31%), while volatile hydrocarbons (benzene or kerosene) accounted for (15.38%) and carbon monoxide (3.85%) and others (3.85%). Overall, minor cases were the commonest (63%) while only 3.8% of cases were severe. About 88.94% of cases were discharged after completed management while death rate was 0.96%. **Conclusion:** Most childhood poisoning cases were males, accidentally, mainly by oral route and in rural areas, most commonly in age group of 3 - 6 years. Most cases were due to therapeutic medications then pesticide exposures. Most of cases were completely cured.

Keywords

Childhood, Poisoning, Zagazig

1. Introduction

It has been reported that the death rate from poisoning in children and adolescents under 20 years old is about 1.8/100,000 worldwide. So, one of the most common emergencies in childhood is toxic emergencies [1] [2] [3].

Childhood poisoning is a complicated condition resulting from interactive relations of the family, the child, the child's environment and the xenobiotic itself making it frequent [4]. In addition to economic and communities' health damage, childhood poisoning cases also result in an enormous emotional and psychological family load [5]. In any community, risk factors recognition and identification are a primary step for poisoning prevention programs. Reduction of morbidity and mortality can be achieved by risk factor modifications [6].

Educational, cultural, economic and social backgrounds directly affect the underlying cause and agent responsible for childhood poisoning [3] [7].

The objective of this study was to determine the prevalence and pattern of childhood poisoning cases admitted to Zagazig University hospitals.

2. Patients and Methods

This was a hospital-based retrospective observational study. Inclusion criteria; acute poisoning cases in children (<18 years old) who presented directly to Zagazig University hospital emergency department or referred from other hospitals in El-Sharqia governorate after getting informed consent from 1 January 2018 to 31 December 2018. Exclusion criteria; cases presented with allergic reactions, food poisoning cases, chronic cases and acutely poisoned patients aged more than 18 years were excluded from this study.

The included cases were revised for their medical records and the acute poisoning cases were diagnosed and defined according to the following criteria; history of poison exposure with the appropriate clinical picture of the suspected poison and their specific investigations.

The following data were acquired from the medical records:

1) Socio-demographic information: sex, age and residence.

The implicated cases of poisoning were subdivided for comparison between age groups; into: infants (less than one year old), toddlers (1: <3 years old), pre-school age group (3: <6 years old), school age group (6: <12 years old) and adolescents (12: 18 years old) [8].

2) Circumstances of poisoning: route of exposure, mode of exposure (intentional or unintentional), suspected xenobiotic responsible for poisoning.

3) Severity and outcome of the case; we classified the cases using their data in their clinical records (clinical picture and investigations done) according to the poison severity score (PSS) [9] that classified poisoned cases into four grades, None (0): no signs or symptoms of poisoning, Minor (grade 1): mild or spontaneously resolving symptoms, Moderate (grade 2): prolonged or pronounced symptoms, Severe (grade 3): severe or life-threatening symptoms.

We used statistical descriptive methods (frequency and percentage) to analyze

data.

3. Results

The total number of cases during the period of study was (624) cases, Males outnumbered females (55.3% versus 44.7% respectively). Patients were divided into 4 groups according to their ages: younger than 1 year, those between 1 and 3 years, those between 3 and 6 years, those between 6 and 12 years, and those between 12 and 18 years. Those from 3 to 6 years represented the highest age group (56.09%) followed by age 1 - 3 years (16.03%), followed by age groups of 12 - 18 years, less than 1 years (10.42% and 8.81% respectively) and the least was 6 - 12 years (8.65%).

According to residence, poisoned cases from rural areas represented the majority of cases (65.06%), opposite to 34.94% from urban areas.

Regarding the route of poisoning; the majority of cases were through oral route (84.94%) while other routes (inhalation, skin, I.V, etc.) accounts only for 15.06%. Most of the poisoned cases were unintentional (92.8%) while only 7.2% were intentional.

The prevalence of childhood poisoning cases in descending order were due to compound therapeutic medications (32.69%) followed by pesticides (26.92%) then household corrosives (17.31%) while volatile hydrocarbons (benzene or kerosene) accounted for 15.38% and carbon monoxide (3.85%) and others (3.85%) (**Figure 1**).

According to the poison severity score (PSS), we arranged the poisoned cases where the highest percent of cases (63%) were minor followed by moderate (23.1%), asymptomatic (10.1%) and lastly the severe cases that accounted only for 3.8%.

About the outcome, there were of 88.94% of cases discharged after complete management and 0.96% death rate. The causes of death were due to severe zinc phosphide poisoning in three cases, paint thinner ingestion in two cases and one case of severe henna toxicity. On the other hand, 10.1% were discharged against medical advice (**Table 1**).

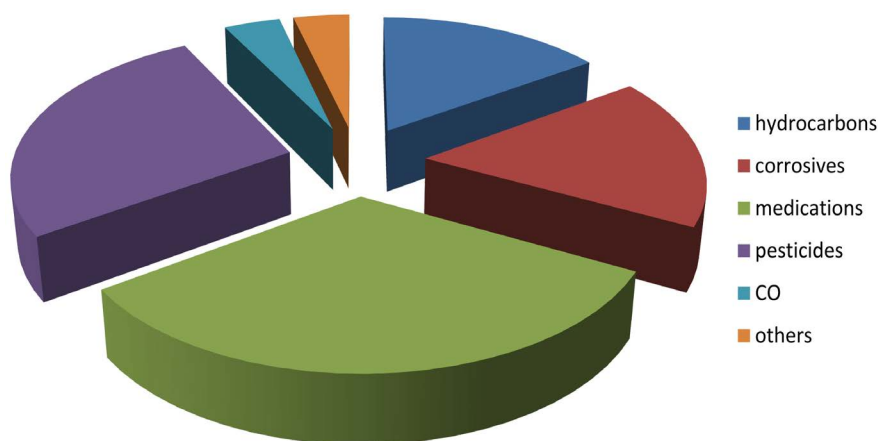


Figure 1. Distribution of major substances involved in childhood poisonings.

Table 1. Demographic and clinical data of poisoned children during the year 2018 in Zagazig university hospitals (total 624 cases).

	Variable	Number	Percent%
Sex	Male	345	55.3%
	Female	279	44.7%
Age	<1 years	55	8.81%
	1: <3 years	100	16.03%
	3: <6 years	350	56.09%
	6: <12 years	54	8.65%
	12: <18 years	65	10.42%
Residence	Rural	406	65.06%
	Urban	218	34.94%
Route of poisoning	Oral	530	84.94%
	Other routes	94	15.06%
Mode of exposure	Unintentional	579	92.8
	Intentional	45	7.2
Involved substances	hydrocarbons	96	15.38%
	Household corrosives	108	17.31%
	Medications	204	32.69%
	Pesticides	168	26.92%
	CO	24	3.846%
	Others	24	3.846%
Severity (PSS)	Asymptomatic (grade 0)	63	10.1%
	Minor (grade 1)	393	63%
	Moderate (grade 2)	144	23.1%
	Severe (grade 3)	24	3.8%
Outcome	Discharge after completed management	555	88.94%
	Discharge against medical advice	63	10.1%
	Died	6	0.96%

4. Discussion

One of the critical causes of emergency unit admissions is acute poisoning. It is considered the third most common emergencies of children resulting in increased economic and social disabilities [10]. For proper preventive measures, it is important to identify the epidemiological pattern of childhood poisoning that we aimed to perform in the current study.

The total number of the admitted cases in the current study was 624 cases

during the period from 1st of January till the end of December 2018. The higher percentage of cases was males (55.3%), while females accounted for 44.7%. This result matched other studies of Ahmed *et al.*, 2011 and Akhtar *et al.*, 2006 [11] [12] who explained that boys were more active than girls, which made them highly liable to unintentional exposure to poisons.

According to age, the study showed that those from 3 to 6 years represented the highest age group (56.09%) followed by the age group (1 - 3 years) which presented 16.03% of cases, followed by age groups of 12 - 18 years and that less than 1 years (10.42% and 8.81% respectively) and the least was age group 6 - 12 years (8.65%). Lamireau *et al.*, 2012 [13] and Hahn *et al.*, 2013 [14] studied that children below 6 years old are more liable to poisoning. They supposed that children in this age are inquisitive about their surroundings. They prefer to explore their environment with unawareness of the danger.

Regarding residence, poisoned cases from rural areas represented the majority of cases (65.06%), opposite to 34.94% from urban areas. These results were in agreement with that of Hassan and Siam, 2014 [2] who supposed that there were more available poisons added to more negligence in rural places than in urban once.

Against to these findings, Alazab, 2012 [15] reported higher incidence rate (79.9%) of childhood poisoning in urban places than in rural ones (20.1%). This may be due to difference in the culture of the studied area. In our study, it's known that sharkia governorate is one of the largest agricultural ones in Egypt with more rural areas and peoples.

The majority of cases were through oral route (84.94%) while other routes (inhalation, skin, I.V, etc.) accounts only for 15.06%. This may result from easily accessible places of poisons and attractive color or container of the poison for the child. Other studies matched the same result [16] [17]. Most of the studied cases were unintentional (92.8%) while only 7.2% were intentional. That agreed Paudyal, 2005 [18] who reported 98.4% of the study were unintentional poisoning.

Increased accessibility and availability of medications for children in their surroundings might be a principle cause of that added to parenteral negligence. Other factors contributing to childhood poisoning may be inquisitiveness of the child, mother's absence during the day [19]. Addiction or chronic disease or psychiatric illness in a member of the family added to easily accessible medications for children were other factors that increased incidence of childhood poisoning [20] [21].

Therapeutic drugs were the most common cause of poisoning in the present study which constituted about (32.69%). This was matched with studies conducted in Turkey [22] and in Iran [23] [24] where poisoning due to medications over-dose was found to be the most common cause of childhood poisoning.

Hassan and Siam, 2014 [2] found that Poisoning with medications was the second most prevalent agent after pesticides in Zagazig university hospitals. Al-

so, Aglan, 2007 [25] reported that, during the year 2004, chemical and household products represented the highest percentage of acute poisoning (43.0%) in children admitted at A in Shams University in Cairo poison control center. These adverse results may be due to change in culture and environmental factors or different duration and time of study.

Poisoning from Pesticide exposure represented also not little percentage of cases (26.92%). This matched with many studies who reported a high percentage of pesticide poisoned cases. Henao and Arbelaez 2002 [26] explained in their study that acute pesticide poisoning was common in children living in agricultural communities.

Worldwide; especially in developing countries, the pesticides use has been widely increased either in agriculture or at homes with easy availability and poorly regulated approach. Some pesticides have the affinity to precipitate in the environment. This makes more risk for exposure especially for children [27] [28].

In the present study, cleaning and household corrosive agents accounted for about 17.31% of the cases of poisoning that agreed to some extent the study of Hyder *et al.*, 2009 [29] who stated that cleaning agents accounted for about 20% of the cases of poisoning in Egypt, Colombia, Bangladesh and Pakistan. Volatile hydrocarbons (benzene and kerosene) accounted for (15.38%) which was parallel to other studies done in developing countries [12].

On the other hand, carbon monoxide poisoned cases were about 3.846% which matched other reports of Mutlu *et al.*, 2010 [30] that in developing countries, there were increased use of cooking fires and poor ventilation at homes.

According to severity, most reported cases (63%) were minor as most of poisoned cases were of accidental exposure. This matched other Indian studies in 2012 as the highest percentage of cases was grade 1 and 0 [31].

Regarding the outcome, the majority of the studied poisoned cases (88.94%) were discharged after completed management while 10.1% were discharged against medical advice. On the other hand, about 0.96% died. The cause of death was severe zinc phosphide poisoning in three cases as it is a known rapidly absorbed highly toxic poison, with no appropriate antidotes [32].

These results, more or less, in agreement with Hassan and Siam, 2014 [2] who reported that the majority of cases (86%) completed their treatment and discharged.

Potential limitations of this retrospective study were some difficulties in data retrieval from unorganized old data files.

5. Conclusion

From the previous findings, we concluded that male children are more exposed to poisoning. The age group from 3 to 6 years was the most liable age. Unintentional poisoning was the highest rate of incidence. Oral route was predominant. Therapeutic medications and pesticides were the most accused.

Conflicts of Interest

The author declares that they have no conflict of interests.

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