Evaluation of the causes of poisoning with addictive agents (narcotics, stimulants, alcohol) among children admitted to Abouzar Hospital from 2016-2019

Anahita Akbari¹, Mehran Hakimzadeh², Farkhondeh Jamshidi¹,³

¹Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
²Department of Pediatrics, School of Medicine, Abouzar Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
³Social Determinant of Health Research Center, Department of Forensic Medicine, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

ABSTRACT

Aim of the study: We aimed to determine the causes of poisoning with addictive agents (narcotics, stimulants, alcohol) among children admitted to Abouzar Hospital from 2016-2019.

Material and methods: This is a descriptive cross-sectional study which had conducted on 424 children those were poisoned with narcotics, stimulants and alcohol referred to Abouzar Hospital in Ahvaz city during 2016-2019. After we took permission of Ethics Committee of the University of Medical Sciences, the researcher referred to Abuzar Hospital to identified the eligible children criteria, and collected all the required information using a checklist. Data analysis was carried out using SPSS ver. 24 and \( p \)-value < 0.05 was considered as the significance level.

Results: A total of 245 (57.8%) of participants were boys. Alcohol, tramadol, opium, crystal, methadone, and heroin poisoning accounted for 12 (2.8%), 2 (0.5), 178 (42%), 34 (8%), 194 (45.8%), and 4 (0.9%) of cases, respectively. A total of 276 people (65.1%) aged less than 3 years old, 414 people (97.6%) lived in the city, and 404 people (95.3%) had no previous history of poisoning. The poisoning occurs at night in 276 (65.1%) of cases and accidental poisoning accounted for 258 (60.8) of cases. Children had access to addictive agents through their parents (both parents) in 144 (34%) of cases. A total of 272 patients (64.2%) discharged and 11 patients (2.6%) died. There was no significant relationship between the cause of poisoning with sex, year and month of referral, place of residence and history and time of poisoning (\( p > 0.05 \)), but there was a significant relationship between the cause of poisoning with age, type and outcome of poisoning and access (\( p < 0.05 \)).

Conclusions: Finding has suggested that appropriate information be provided to parents and inform them of the dangers of poisoning with additive agents among their children.

KEY WORDS: children, narcotics, stimulants, poisoning, addictive agents.

INTRODUCTION

The extent and trend of poisoning over time and in different countries is closely related to the substances and drugs available, as well as the culture of drug prescription by physicians. Poisoning is strongly influenced by changing cultures, available materials, and environmental factors as a whole. This poisoning share seems to be increasing in recent years with the expansion of the use of psychedelics and the introduction of new materials and synthetic pills [1]. On the other hand, approximately one million cases of severe accidental pesticide poison-
ing occur in the world every year, and during this period, about two million admissions occur due to suicide with pesticides, most of which occurred in countries with agriculture-based economy [2].

Access to drugs and chemicals in Iran is not a difficult task. Therefore, it will not be far from expectation if there is a lot of related poisoning [3]. Poisoning is one of the most important medical emergencies and one of the most common causes of referrals to medical centers, so that it accounts for 15 to 20% of referrals. More than half a million people worldwide die each year from poisoning, 99% of which occur in developing countries, according to the World Health Organization (WHO) [4].

Poisoning is on the rise due to changes in lifestyle and social behaviors that are affected by several factors including geographical, social, economic, religious and cultural factors. Today, the development of societies leads to greater access to drugs, increasing use of detergents, disinfectants and insecticides, which has led to an increase in the burden of poisoning. Poisonings can be divided into two general categories of non-accidental and accidental poisoning in terms of intention and cause [5].

Unintentional poisoning is defined as the non-accidental use toxins with the intent to harm oneself or another, which is more common in adults and is often seen in other forms of sadism or suicide. Unwanted or accidental poisoning, on the other hand, occurs when people are mistakenly poisoned without the intention of harming themselves by substance abuse or drug overdose [6].

Some of intentional poisoning include food, fungal, pharmaceutical, chemical, narcotics and insecticides poisonings, which have become more important due to the increasing development of various toxins and drugs. In the last century, drugs- and toxins-related poisoning has been more prevalent due to the introduction of different formulas and combinations of chemicals to the market, which has led to the patient death in most cases [7].

On the other hand, the pattern of poisoning may vary from country to country and also within the existing regions of a country. This difference may be due to the level of access to chemicals, drugs and toxins, socio-economic characteristics, social beliefs, customs, education and family economic conditions [8].

Acute poisoning is a known health problem that puts everyone at risk. Among them, children, adolescents, women of childbearing age, and the elderly are reportedly more at risk. Poisoning is reported to be one of the most important medical emergencies and a common cause of death in children, especially in developing countries and Iran, so that it accounts for 70% of all poisonings of all age groups [9]. Children are often poisoned due to curiosity or imitation, and more than 90% of these cases happen by accident. Poisoning in adolescents is also doubly important considering special physical and psychological conditions. Moreover, considering the young population of Iran, poisoning in adolescent groups accounts for up to 22% of patients referred to poisoning wards, which is very significant as compared to European countries [10].

In addition to increasing the poisoning incidence rate, unfortunately, adolescent mortality is high and worrying. Women of childbearing age are also important strata of society and poisoning is the most common form of failed suicide attempt with debilitating complications among them. Poisoning is the third leading cause of injuries resulting in hospitalization (16.40%), among women of childbearing age and they are considered as the most vulnerable group are at risk of unintentional drug poisoning, especially neuropsychiatric drugs with suicidal ideation [11].

In this regard, the incidence of poisoning among the elderly is one of the most significant serious problems in the health of the elderly. This group is prone to unintentional or intentional poisoning due to special conditions such as poor health, chronic diseases, multiple disabilities, cognitive impairments, retirement, death of spouse, loss of independence, and depression [12].

Each year, a large number of vulnerable groups suffer from illnesses, hospitalization or death due to unintentional or intentional poisoning, and identifying poisonings and related factors in each region can help to plan and find prevention and health recommendations [13].

Therefore, considering that age, education level and other demographic variables have been effective on the rate of poisoning in previous studies, on the one hand, the high burden of poisoning and the lack of a similar study in Ahvaz in recent years, on the other hand, so, the present study aims to determine the causes of poisoning with addictive agents (narcotics, stimulants, alcohol) among children admitted to Abuzar Hospital during 2016 to 2019.

MATERIAL AND METHODS

STUDY LOCATION

This study has done in Ahvaz city Khuzestan province, which has located in sought west of Iran [14].

STUDY DESIGN

This descriptive cross-sectional study was performed in 2020 on all children poisoned with narcotics, stimulants, and alcohol referred to Abuzar Hospital of Ahvaz in 2016-2019. After approval of the research project by the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences, the researcher referred to the study setting (Abuzar Hospital in Ahvaz) under the number IR.AJUMS.HGOLESTAN.REC.1399.041 He then included 424 eligible children using census sampling. Inclusion criteria included children with unintentional and inten-
tional poisoning who referred to Abuzar Hospital of Ahvaz during four years (2016-2019) who were poisoned by three agents: narcotics, stimulants, and alcohol.

Exclusion criteria also included poisoned children with incomplete medical records so that the checklist could not be completed and children poisoned with other causes.

After referring to Abuzar Hospital in Ahvaz, the researcher identified the children based on the inclusion criteria from 2016 to 2019, and collected all the required information using a checklist. The checklist included demographic and poisoning characteristics of children. The collected data were analyzed using SPSS ver. 22 and \( p \)-value < 0.05 was considered as the significance level. Mean and standard deviation were used to express quantitative variables, and distribution and frequency were also used in the case of qualitative variables. The data normality was evaluated using Kolmogorov-Smirnov test and t-test was also used for quantitative data and chi-square test was used for qualitative data.

RESULTS

Table 1 shows percentage and frequency distribution of demographic variables.

According to the results obtained from Table 1, there were 245 boys (57.8%) and 179 girls (42.2%). Alcohol, tramadol, opium, crystal, methadone, and heroin poisoning accounted for 12 (2.8%), 2 (0.5), 178 (42%), 34 (8%), 194 (45.8%), and 4 (0.9%) of cases, respectively. A total of 276 people (65.1%) aged less than 3 years old, 115 people (27.1%) aged 3-6 years old, 29 people (6.8%) aged 7-12 years old, 4 people (0.9%) aged more than 12 years old. Participants referred to the above hospital 2016, 2017, 2018, and 2019 in 87 (20.5%), 120 (28.3%), 104 (24.5%), and 113 (26.7%) of cases, respectively. A total of 414 (97.6%) and 10 (2.4%) of the participants lived in the city and village, respectively. A total of 404 patients (95.3%) had no previous history and 20 patients (4.7%) had a previous history of poisoning. Poisoning occurs during night and day for 276 (65.1%) and 148 (34.9%) patients, respectively. The addictive agents were available to the patients through friends, relatives, father, mother, unknown source, and parents (both parents) in 10 (2.4%), 47 (11.1%), 102 (24.1%), 3 (0.7%), 118 (27.8%) and 144 (34%) of cases, respectively.

There was no significant relationship between the cause of poisoning with sex, year of referral, place of residence, history of previous poisoning, and time of poisoning (\( p > 0.05 \)). However, there was a significant relationship between the cause of poisoning and age (\( p < 0.05 \)). The highest poisoning rate was observed among children under 3 years. There was also a significant relationship between poisoning rate and access (\( p < 0.05 \)). The most important sourced of access to narcotic agents for children included parents and then fathers.

Table 2 shows the percentage and frequency distribution of the poisoning agent in the subjects.

According to the results obtained from Table 2, methadone, has mentioned more than others.

| Statistical indices | n (%) | \( p \) value |
|---------------------|-------|--------------|
| Alcohol             | 12 (2.8) |              |
| Tramadol            | 2 (0.5) |              |
| Opium               | 178 (42) |              |
| Crystal             | 34 (8) |              |
| Methadone           | 194 (45.8) |            |
| Heroin              | 4 (0.9) |              |

Table 1. Percentage and frequency distribution of demographic variables

| Statistical indices | n (%) | \( p \) value |
|---------------------|-------|--------------|
| Age                 |       |              |
| Less than 3 years   | 276 (65.1) | 0.0001 |
| 3-6 years           | 115 (27.1) |
| 7-12 years          | 29 (6.8) |
| More than 12 years  | 4 (0.9) |
| Sex                 |       | 0.811        |
| Boy                 | 245 (57.8) |
| Girl                | 179 (42.2) |
| Year of referral    |       | 0.227        |
| 2016                | 87 (20.5) |
| 2017                | 120 (28.3) |
| 2018                | 104 (24.5) |
| 2019                | 113 (26.7) |
| Place of residence  |       | 0.918        |
| City                | 414 (97.6) |
| Village             | 10 (2.4) |
| History of previous poisoning |       | 0.363        |
| Yes                 | 404 (97.6) |
| No                  | 20 (4.7) |
| Time of poisoning   |       | 0.750        |
| Day                 | 276 (65.1) |
| Night               | 148 (34.9) |
| Access              |       | 0.001        |
| Friends             | 10 (2.4) |
| Relatives           | 47 (11.1) |
| Father              | 102 (24.1) |
| Mother              | 3 (0.7) |
| Unknown             | 118 (27.8) |

Table 2. Percentage and frequency distribution of poisoning agent.
Table 3 shows the percentage and frequency distribution of the poisoning agent according to the final outcome and the type of poisoning in the subjects. Results from Table 3 has shown that 272 patients (64.2%) were discharged, 136 patients (32.1%) expressed their personal consent and were discharged, 5 patients (1.2%) escaped, and 11 patients (2.6%) died. There was a significant relationship between the cause of poisoning and the final outcome ($p < 0.05$).

Also, the type of poisoning was unintentional − child, unintentional − parents, and intentional in 29 (6.8%), 137 (32.3%), and 258 (60.8%) patents, respectively. There was a significant relationship between the cause of poisoning and the type of poisoning ($p < 0.05$) and prevalence of accidental poisoning was more than that of non-accidental poisoning.

**DISCUSSION**

In a study on patients diagnosed with opium poisoning in the Children's Medical Center Hospital, Kadivar (2000) examined 34 patients from 1991 to September 1998. The minimum and maximum age range was 7 days old and 3.5 years old, respectively (mean: 7 months). In most cases, opium was administered orally by relatives. The presence of an addicted person in the family was emphasized in 38.2% of these patients [15]. In the present study, more than 50% of children were under 3 years old. Opium was the most common cause of poisoning, and parents were the most important sources of access of the child to the addictive drug, which is consistent with the results of the Kadivar’s study. A finding of investigated on 67 children in a study. The minimum and maximum age range was 6 days and 5 years, respectively. There were also four deaths. Also, 61.2% of poisoned children lived in rural areas. Pure opium was the most highly consumed addictive drug (63.6%) [16]. In the present study, more than 50% of children were under 3 years of age. The most common cause of poisoning was opium, which is consistent with the results of the Besharat’s study' however, in the present study, the number of children living in cities were more than those living in villages, and the number of deaths was higher. A study on children referred to the Emergency Department of Imam Khomeini Hospital in Jiroft. They showed that 53.7% of participants were boys and the most common age group was less than three years old. Also, 45% of the children lived in the city. The most common poisoning agents were human drugs (36%), followed by methadone (28%) and other narcotics (13%) [17], which were consistent with the present study in terms of the frequency of sex, age and place of residence, but not consistent in terms of most commonly poisoning drug. This inconsistency can be due to differences in narcotics and common stimulants used in different cities. Other study carried out a study on 5064 patients admitted to the Poisoning ward, Emergency Department of the Imam Reza Hospital in Mashhad. The results showed that out of 5064 patients studied, 2635 (52%) were females and the rest were males. The mean age of patients was 27.3 ±14.6 years and the highest cases of poisoning were observed in the 20-29-year age group (41.4%). The most common causes of poisoning included...
drug use (64.6%) and narcotics (22.9%) (18), which were not consistent with the results of the present study. This inconsistency may be due to differences in age groups in the two studies. Also carried out a study on 260 poisoned patients referred to the Emergency Department in the Hospital. The results showed that the mean age of patients was 23.10 ±15.16 years and most of the participants were in the 11-30-year age group, male, single, Iranian and living in the city. Most poisoning cases were non-accidental (58.1%). Drugs, methadone, pesticides, and opium were the most common causes of poisoning, respectively. The majority of accidental poisoning (68.3%) occurred among children under 10 years old and methadone was the most common cause of accidental poisoning. The mortality rate was 1.9% and pesticides were the cause of 60% of deaths [19], which was not consistent with the results of the present study. This inconsistency can be due to differences in the studied age groups. Most of the children were in the < 3-year-age group in the present study and opium was the most common cause of poisoning, which is not consistent with the results of the Tor-kashvand's study.

Rahmani investigated 1007 poisoned patients referred to Razi Hospital in Ahvaz. They found that 46.7% of the study population were women and 53.3% were men. Also, most of the participants (64.2%) were in the 15-30-year age group and 78% of cases had used the drug in order to commit suicide and there was a history of mental problems in 20.2% of cases [20], which was not consistent with the results of the present study. This inconsistency can be due to differences in the studied age groups. A study has investigated 97 children with poisoned patients referred to the Pediatric Emergency Department of Ali Ibn Abitaleb Hospital. They found that out of 97 poisoned children, 57 (58.76%) and 40 (41.24%) were boys and girls, respectively. Also, 7 (7.2%) of these children, 67 (69.1%) of fathers and 16 (16.5%) of mothers were addicted. Accidental poisoning occurred in 71 cases (73.2%). The highest number of referrals occurred during night shifts and autumn [21], which is consistent with the results of the present study. The causes of poisoning in terms of prevalence in male sex, access to poisoning agents by the father, more referrals during night shifts, and accidental poisoning. Izadi studied 184 patients with tramadol poisoning. They found that 141 patients were male and 43 were female. The mean age of the patients was 24 ±7 years. Also, 41% of the patients had a history of addiction [22], which is not comparable with the results of the present study. Izadi study only investigated patients with tramadol poisoning. In a study in the state of Uttarakhand, Kylie examined 156 patients with acute poisoning. They found 53 patients (33.9%) were in the elderly age group (60 years). The maximum number of patients belonged to the 71-80-year age group (26%, 16.6%). The prevalence of the acute poisoning was higher among men than women. The most common poisoning agents in the elderly age group was alcohol poisoning and then pesticide poisoning (organophosphate), which is not comparable with the results of the present study. Patients of all age groups were studied in Kylie's study.

Nestor showed in a study that 480 children were hospitalized with accidental poisoning. Most of them were in the 1-2-year age group (n = 120 people). The causes of these poisonings were household chemicals, carbon monoxide and insecticides [23], which were consistent with the results of the present study in terms of age groups and accidental poisoning, but not in terms of the type of poisoning agents. In a study at the Ally hospital in Tanzania, Mobarak investigated 8827 patients and 106 (1.2%) patients met inclusion criteria. The mean age of patients was 28 years and 81 (76.4%) were male. Causes of poisoning included alcohol (n = 42 cases, 50%) and a combination of different drugs (n = 12 cases, 14.3%). Most exposures were non-accidental (63.4%) and occurred through the oral route (88%). The most common abnormal physical findings included mental state (66%) and one patient died [24], which is not consistent with the present study in terms of the study population; however, the number of boys was more than girls and most exposures were non-accidental in two studies. In the present study, the number of deaths was higher.

Some of the limitations of the present study included that if the study ranged conducted during longer time period on larger sample size, we could comment on the results with more certainty. Also, there was a few publications related to this topic as compare in discussion section.

CONCLUSIONS

Findings of the present study showed no significant relationship between the cause of poisoning with sex, year of referral, place of residence and history and time of poisoning; however, there was a significant relationship between the cause of poisoning with age, type and outcome of poisoning and access. According to the results, it should be noted that narcotic and stimulant poisoning in children can have impacts on their future and impose heavy costs on the family and society in adulthood. In this regard, it is suggested to provide parents with appropriate information and inform them of the dangers of poisoning children with these substances. On the other hand, there were some cases of hospital discharge with personal consent in the present study and the child fate was not known.

DISCLOSURE

The authors declare no conflict of interest.
Evaluation of the causes of poisoning with addictive agents (narcotics, stimulants, alcohol) among children admitted to Abouzar Hospital from 2016-2019

REFERENCES

1. Kate Churruca, Rebecca Mitchell. Exploring coronial determination of intent for poisoning-related deaths in Australia, 2001–2013. BMC Public Health 2018; 18: 83.

2. Hempestad K, Phillips J. Divergence In Recent Trends In Deaths From Intentional And Unintentional Poisoning. Health Aff (Millwood) 2019; 38: 29–35.

3. Khan NU, Fayyaz J, Khan UR, Feroze A. Importance of clinical toxicology teaching and its impact in improving. Journal of Pakistan Medical Association 2013; 63: 1379-1382.

4. Mowry JB, Spyker DA, Cantilena LR Jr, Bailey JE, Ford M. Annual Report of the American Association of Poison Control Centers’ National Poison Data System (NPDS): 30th Annual Report. Clin Toxicol (Philad) 2012; 51: 949-1229.

5. Leena A, Chanda K. Patterns of poisoning and drug overdosage and their outcome among in-patients admitted to the emergency medicine department of a tertiary care hospital. Indian J Crit Care Med 2012; 16: 130–135.

6. Dayasiri MB, Jayamanne KC, Jayasinghe CY. Patterns and outcome of acute poisoning among children in rural Sri Lanka. BMC Pediatr 2018; 18: 274.

7. Tigist Bacha, Birkneh Tilahun. A cross-sectional study of children with acute poisoning: A three-year retrospective analysis. World J Emerg Med 2015; 6: 265-269.

8. Schmertmann M, Williamson A, Black D. Unintentional poisoning in young children: does developmental stage predict the type of substance accessed and ingested? Child Care Health Dev 2014; 40: 50–59.

9. Avau B, Borra V, Vanhove AC. First aid interventions by laypeople for acute oral poisoning. Cochrane Database Syst Rev 2018; 12: CD013230.

10. Lee J, Fan NC, Yao TC, et al. Clinical spectrum of acute poisoning in children admitted to the pediatric emergency department. Pediatr Neonatol 2019; 60: 59-67.

11. Dutta AK, Seth A, Goyal PK, Aggarwal V. Poisoning in children: Indian scenario. Indian J Pediatr 2018; 65: 365-370.

12. Hauptman M, Brucoleri R. An Update on Childhood Lead Poisoning. Clin Pediatr Emerg Med 2017; 18: 181-192.

13. Rakesh S, Neelanjana, Rawat N, et al. Mortality and morbidity associated with acute poisoning cases in north-east India: A retrospective study. J Family Med Prim Care 2019; 8: 2068-2072.

14. Cheraghi M, Rahimi Z, Parsa S. Prevalence of cervical-vaginal infections in the pvp-smear samples in Iran. Glob J Health Sci 2013; 6: 201-206.

15. Kadivar M, Javadinia N, Nemati N. A survey on opium & its derivatives poisoning in childrens hospital medical center. Journal of Medical Council of I.R.I. 2000; 18: 100-106.

16. Besharat S (MD), Besharat M, Akhavan Masouleh A (MD), Jabbari A (MD), Yazdi HR (MD). Opium intoxication in children under 5 years old, Golestan - Iran (2006-07). J Gorgan Univ Med Sci 2010; 12: 85-89.

17. Nikzar M, Faramarzpour M, Vazirinasab H, Mozaffari N. The frequency of causes of poisoning in children referred to Imam Khomeini hospital of Jiroft in 2015. Jurnal of Jiroft University of Medical Sciences 2017; 3: 55-64.

18. Jamshidi F, Nazari I, Malayeri HT, et al. Pattern of drug abuse in addicts self-referred drug rehabilitation centers in Khuzestan province - Iran, 2014-2015. Arch Med Sadowej Kryminol 2016; 66: 1-12.

19. Jamshidi F, Nazari I, Cheraghi M. Risky behaviors of injecting drug users (IDUs) referred to addiction rehabilitation centers in Khuzestan Province in 2014. Online Journal of Health and Allied Sciences 2017; 16: 5.

20. Torkashvand F, Sheikh Fathollahi M, Shamsi S, et al. Evaluating the Pattern of Acute Poisoning in Cases Referred to the Emergency Department of Ali-ebn Abi Taleb Hospital of Rafsanjan from October 2013 to September 2014. JRUMS 2015; 14: 311-324.

21. Rahmani AH, Jafari M, Farnam M, Zafari J. Evaluation of Epidemiologic of Drug Poisoning in the Ahvaz Razi Hospital in the Years of 2004-2008. Iran J Forensic Med 2015; 21: 43–46.

22. Masoudpour N, Zare-Bidaki M, Sedighi E, Bakhtar M. Frequency and Related Factors of Methadone Poisoning in Children Aged under 15 Years Attending Children Emergency Center of Rafsanjan Ali-Ebne- Abitaleb Hospital In 2013. J Rafsanjan Univ Med Sci 2015; 14: 561-574.

23. Kaelny N, Bhushan B, Subramanyam V. Clinical and demographic characteristics of geriatric patients with acute poisoning in the state of Uttarakhand. J Family Med Prim Care 2019; 8: 443-448.

24. Frasinart N, Otilia E, Ruginà A. Epidemiological study on accidental poisonings in children from northeast Romania. Medicine (Baltimore) 2018; 97: e11469.