

Evaluation of poisoning cases applying to pediatric emergency service unit: Retrospective study

 Ahmet Guzelcicek

Department of Pediatrics, Faculty of Medicine, Harran University Hospital, Sanliurfa, Turkey

Copyright © 2020 by authors and Annals of Medical Research Publishing Inc.

Abstract

Aim: Poisoning cases have a significant place among childhood health problems in terms of morbidity and mortality. Cases involving children younger than five years of age constitute the most common poisoning cases that are caused by accidents or injuries. In this study, we attempted to determine the possible precautions by analyzing the age distribution in childhood poisoning cases.

Material and Methods: The files of poisoning cases applying to the pediatric emergency service unit of the hospital between March 2018 and March 2019 have been retrospectively analyzed. Cases have been analyzed in terms of patients' age, sex and nationality and also in terms of causes of poisoning and pharmacological agents that cause poisoning.

Results: 120 poisoning cases admitted to emergency service throughout one-year period comprised 0.4% of all (24,942) applications. 57 of the patients (47.5%) were female while 63 (52.5%) were male. The youngest of the patients was 0-year-old and the oldest was 17 years old and the average age of the patients was 5.2 ± 5.5 . Poisoning cases were most frequently seen (70,8%) in children in 0-5 age range and male patients comprised the majority of them. The most common cause of poisoning was paracetamol and antipyretic type of medicines. Others were organophosphate (19.4%), rat poison (12.9%) and other substances (antipsychotics, antibiotics and vitamins) (8.1%) and caustic substances (6.7%).

Conclusion: Most of the poisoning cases were caused by medicines that were left out in the open. We think such cases can be reduced through parent education.

Keywords: Childhood; emergency service; epidemiology; medicines; poisoning; toxic substances

INTRODUCTION

Poisoning is sometimes a life-threatening occurrence where a substance causes toxic symptoms upon being taken into the body, in amounts that can harm the body, through the mouth, breath, skin, eyes or the veins. Poisoning cases have a significant place among childhood health problems in terms of morbidity and mortality. Cases involving children younger than five years of age constitute the most common poisoning cases that are caused by accidents or injuries (1-5). It is observed in studies that the mortality rate attributed to poisoning alternates between 0% and 4.5% (6,7). Children younger than 5 years of age comprise 80% of the poisoning cases. As for suicidally motivated drug poisoning, such cases occur in school children and adolescents.

It is observed that causes of poisoning differ in relation to the age and sex of the child. Poisoning cases involving children who are five or younger mostly involve male children and they are usually caused by one substance taken in by accident. As for poisoning cases in adolescents,

they occur as a result of suicide attempts and are observed more often in female adolescents. They occur mostly through the taking of more than one substance (8-10). 80-85% of the poisoning cases are by accident and 15-20% of them occur as a result of suicide attempts (11).

As the substances that cause poisoning change depending on countries and regions, it is crucial to do research on poisoning profiles regarding these factors and to determine regional threats (12,13).

The objective of this study is to evaluate the age distribution in poisoning cases applying to pediatric emergency service unit of our hospital and to attract attention to precautions that can be taken.

MATERIAL and METHODS

In this study, the files of 120 patients who applied to the pediatric emergency service unit of our hospital between March 2018-March 2019 are retrospectively analyzed. Patients are evaluated in terms of age, sex and poisoning substances. In addition, because there is a heavy Syrian

Received: 31.03.2020 **Accepted:** 21.08.2020 **Available online:** 22.09.2020

Corresponding Author: Ahmet Guzelcicek, Department of Pediatrics, Faculty of Medicine, Harran University Hospital, Sanliurfa, Turkey

E-mail: aguzelcicek@hotmail.com

population, cases are also analyzed in terms of nationality. As intoxications with caustic substances are treated in pediatric surgery unit, they are not included in this study. The causes of poisoning are grouped as paracetamol and antipyretics, organophosphates and pesticides, rat poison and others (unknown, antipsychotics, antibiotics and vitamins). The ages of children involved in poisoning cases are grouped as 0-5, 6-11 and 12-17 age ranges. Data have been analyzed with SPSS software package. Percentage and chi-square test has been used in data analysis.

RESULTS

One hundred twenty poisoning cases that applied to emergency service unit throughout the one-year period in which this analysis was carried out comprised 0.4% of all (24942) applications. 57 of the patients (47.5%) were female, 63 (52.5%) were male (Table 3). The male/ female ratio was 1,1. While cases involving children in 10 months to 5 age range were mostly male, the poisoning cases involving adolescents in 12-17 age range were mostly female. The youngest of the patients was 10 months old, while the oldest was 17 and the average age was 5.2 ± 5.5 . 110 of the poisoning cases (91.7%) were citizens of Turkish Republic, 8 (6.7%) were Syrian nationals and 2 (1.7%) were citizens of Germany with Turkish origin.

Table 1. Age distribution in poisoning cases

Age Range	Number	Percentage
Age 0-5*	85	70.8
Age 6-11	11	9.2
Age 12-17	24	20
Total	120	100

*Children under the age of 1 were evaluated as 0 age

Poisoning cases were most commonly (70.8%) observed in children in 10 months to 5 age range and the majority of this group of patients were male. The age distribution in poisoning cases can be seen in Table 1.

Table 2. The distribution of poisoning substances in poisoning cases

Substances	Number of cases	Percentage
Paracetamol and antipyretics	63	52.5
Organophosphate and pesticides	9	7.5
Rat poison	4	3.3
Other (unknown, antipsychotics, antibiotics, vitamins)	44	36.7
Total	120	100

Table 3. Distribution according to sex and age.

Age	Male(%)	Female(%)
0-5*	46(54.1)	39(45.9)
6-11	9(81)	2(19)
12-17	8(33.3)	16(66.7)
Total	63(52.5)	57(47.5)

*Children under the age of 1 were evaluated as 0 age

The most common cause of poisoning was paracetamol and antipyretic type of medicines (52.4%). Other factors are organophosphates (7.5%), rat poison (3.3%), other (unknown, antipsychotics, antibiotics, vitamins and antihistaminic) (36.7%). The distribution of poisoning substances in poisoning cases can be seen in Table 2.

DISCUSSION

Childhood poisoning cases remain a significant public health problem. The rate of poisoning across the world is increasing as years go by (10,11). Aji and Özdemir did research on childhood poisoning cases in our country and included 38 medical establishments in Turkey in their studies (11). They stated that 5077 cases that they analyzed comprised 0.9% of all patients brought to the emergency service units. In our study, it has been established that 0,4% of all the applications to the pediatric emergency service unit involved poisoning cases.

According to our research, poisoning cases occur most frequently (70.8%) in children in 10 months to 5 years of age range and the majority of these cases are male. The most common cause of poisoning are paracetamol and antipyretic type of medicines (52.5%). According to a study based on data collected from 72 separate centers in the USA between 1985-1989, 60.8% of 3.8 million cases involved children younger than 6 (14). Our study is compatible with similar studies published in the medical literature (6,15).

When poisoning substances are analyzed and compared with pharmacological agents of the past, it is observed that paracetamol replaced salicylates and that there is a significant increase in tricyclic antidepressants (16). The most common pharmacological agent observed in this study were paracetamol and antipyretic medications (70.8%). Unintentional poisoning is observed, especially in children in 1-5 age range, which encompasses a time when children's curiosity and physical activities increase. Such cases involve especially male children (17). The ignorance of the parents about poisoning has an important role in these unintentional poisoning cases. Other factors include the preservation of substances that can cause poisoning within easy reach of the children or keeping them outside the medicine containers and failure in keeping children under control.

Another important factor that causes unintentional poisoning cases is that medications or other toxic

substances are not put in containers with safety lids that do not open easily (17-19). Poisoning cases are considered to occur because of young children's discovery instinct and their tendency to take everything to mouth and the failure of the family in having an eye on children.

While unintentional poisoning cases are more often observed in all ages than conscious poisoning, suicidality motivated poisoning cases that involve female adolescents in 13-17 age range attract attention (15,17,18). In this study, the poisoning tendency in the 12-17 age group was 2 times higher in females than in males (Table 3). Mental and physical changes caused by puberty, family conflicts, failure in school, loss of a parent, deficiency of love are factors that increase suicidal tendencies. Overdose and taking more than one medication in suicide cases attract attention (15).

Poisoning cases involving male children are observed in a higher proportion. This can be explained by male children's curious and active constitution (20,21). The male/ female ratio has been found to be 1.1 in this study. This bears similarity with other works published in the literature.

When we looked at the nationality of patients due to the density of the Syrian immigrants' population, we found the number of poisoning cases involving Syrian children to be lesser than expected (6.7%). We thought it was because these patients cannot apply to university hospitals without being transferred from another medical establishment and because access to our hospital is difficult.

In studies carried out in Turkey, medicines are observed to be a common intoxicating substance. Intoxication with antidepressants, analgesics and antipyretics are observed quite frequently. When poisoning cases caused by medicines were analyzed, paracetamol and antipyretics type of medicines were determined to be the most common causes. In addition, intoxication with unknown medicines (medicines whose names are either forgotten or not known) is found to have a significant proportion (36.7%). We think these cases might have been caused by family members' uneducated and oblivious attitudes. The limitation of this study is that the rates may vary with other studies according to the geographical and sociocultural level differences.

CONCLUSION

In conclusion, it is crucial to know about the poisoning cases in our country and their causes. Poisoning cases brought to pediatric emergency service unit are among the most common preventable causes of childhood morbidity. In order to decrease the frequency of poisoning cases, children's access to toxic substances and medicines must be prevented and kept under control. It is crucial that toxic substance productions should avoid shapes and colors attractive to children. It is also very important to create a safe environment without toxic substances and to make sure that children are under parents' control. To decrease the number of deliberate poisoning cases

involving adolescents, children in this age range must be closely tracked, and help and support of psychiatrists must be sought if necessary.

Acknowledgments: We are grateful to all participants who volunteered for this study.

Competing interests: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports.

Ethical approval: Ethics committee of Medicine Faculty of Harran University (30.03.2020/06-02).

REFERENCES

- Miracle VA. Lead poisoning in children and adults. *Dimensions of Critical Care Nurs* 2017;36:71-3.
- Hon K, Fung C, Leung A. Childhood lead poisoning: an overview. *Hong Kong Med J* 2017;23:616-21.
- Fokum FD, Shahidullah M, Jorgensen E, et al. Prevalence and Elimination of Childhood Lead Poisoning in Illinois, 1996–2012. *Applied Demography and Public Health in the 21st Century: Springer* 2017;221-36.
- Sharif F, Khan RA, Keenan P. Poisoning in a paediatric hospital. *Ir J Med Sci* 2003;172-8.
- Raj A, Panda PK, Singh SS. Amlodipine (150 mg) Poisoning: A Case Study. *Curr Drug Saf* 2018;13:144-7.
- Riordan M, Rylance G, Berry K. Poisoning in children 1: general management. *rch Dis Child Educ Pract Ed* 2002;87:392-6.
- Osterhoudt K, Shannon M, Henretig F. Toxicologic emergencies. *Textbook of pediatric emergency medicine*. edited by GR. Fleisher and S. Ludwig. Philadelphia: Lippincott Williams-Wilkins 2000:796-844.
- Sahin S, Carman KB, Dinleyici EC. Acute poisoning in children; data of a pediatric emergency unit. *Iran J Pediatr* 2011;21:479.
- Dart R, Rumack B. Hay WW, et al. *Current pediatric diagnosis and treatment 18th ed* NY: Mc Graw-Hill. 2007:335-60.
- Andiran N, Hastanesinde SFIDC. son altı yılda izlenen akut zehirlenmeler. *Katkı Pediatri Derg* 2001;22:396-408.
- Biçer S, Sezer S, Çetindağ F, et al. Acil Çocuk Kliniği 2005 Yılı Akut Zehirlenme Olgularının Değerlendirilmesi. *2007;20:12-20.*
- Shannon M. Ingestion of toxic substances by children. *New England Journal of Medicine*. 2000;342:186-91.
- Ozdemir R, Bayrakçı BZ. Hacettepe deneyimi. *Katkı Ped Derg* 2009;31:47-87.
- Litovitz T, Manoguerra A. Comparison of Pediatric Poisoning Hazards: An Analysis of 3.8 Million Exposure Incidents A Report from the American Association of Poison Control Centers. *Pediatrics* 1992;89:999-1006.
- Rodgers G, Matyunas N. Poisonings: drugs, chemicals and plants. *Nelson textbook of pediatrics*. Behrman, Kliegman, Jenson. Philadelphia: WB Saunders Company 2000;722:2160-3.

16. Bostanci İ, Kupelioglu M, Bedir E, et al. Çocuk zehirlenme olgularının retrospektif değerlendirilmesi. *Türkiye Klinikleri J Pediatrics*. 1999;8:143-6.
17. Ergür TA, Sütçü İ, Tanzer F. Pediatri servisimizdeki zehirlenme olgularının değerlendirilmesi 1999;8:9-14.
18. Ertekin V, Altinkaynak S, Alp H, et al. Çocukluk çağında zehirlenmeler. Son uc yıldaki vakaların değerlendirilmesi *Cocuk Derg* 2001;1:104-9.
19. L Hon K, K Fung C, W Lee V, et al. Neurologic and Cardiovascular Complications in Pediatric Life Threatening Imipramine Poisoning. *Curr Drug Saf* 2015;10:261-5.
20. Zehirlenmeler UN. Neyzi O, Ertuğrul T (eds) *Çocuk Sağlığı ve Hastalıkları*. Nobel Tıp Kitabevleri, İstanbul. 2002:1529-55.
21. Bekdaş M, Atakan C, Kapuağası A. Hastanemize başvuran zehirlenme vakalarının değerlendirilmesi. *Yeni Tıp Dergisi* 2000;17:78-80.