

PATTERN OF CHILDHOOD POISONING IN ABHA CITY – SOUTHWESTERN SAUDI ARABIA

Mohammed A. Al-Shehri, FRCPC, College of Medicine and Medical Sciences, King Khalid University, Abha, Saudi Arabia

هدف الدراسة: وصف النموذج النمطي لتسممات الأطفال في قسم الأطفال وقسم الإسعاف في مستشفى عسير المركزي، وذلك من أجل الوصول إلى معرفة الأسباب الكامنة خلفها وبالتالي اقتراح طرق الوقاية.

طريقة الدراسة: هذه دراسة استرجاعية للأطفال المصابين بالتسمم والذين راجعوا قسم الإسعاف في مستشفى عسير المركزي أو الذين تم قبولهم في قسم الأطفال في نفس المستشفى في مدينة أبها، المملكة العربية السعودية، وذلك خلال الفترة من كانون الثاني عام 2000 ميلادية وحتى كانون الأول عام 2003 ميلادية. تمت هذه الدراسة على الأطفال الذين تقل أعمارهم عن 12 سنة. تمت مراجعة السجلات الطبية من أجل جمع المعلومات السريرية التالية مثل العمر والجنس ونوع التسمم والحالة السريرية وقت الإدخال للمستشفى، وكذلك تاريخ ومكان ووقت التعرض للعامل السمي.

نتائج الدراسة: تم دراسة 114 طفلاً في حالة تسمم ممن تقل أعمارهم عن 12 سنة. وقد وجد أن الأطفال من عمر 2-4 سنوات كانوا أكثر عرضة للتسممات (نسبة 81%). وكانت نسبة الذكور (68%) والإناث (32%) وذلك بنسبة 2:1. معظم العوامل المسببة كانت الأدوية الطبية (72%). وباعتبار الحالة السريرية وقت الإدخال للمستشفى فإن الأعراض والعلامات التالية مثل التهويم (النعاس) والغثيان والإقياء وكذلك الألم البطني، كانت موجودة في 82% من الحالات. 80% من الحالات التسممية المدخلة للمستشفى كانت في وقت النهار، و 71% من الحالات التسممية كانت خلال الفترة من شهر حزيران إلى شهر آب. وبالنسبة لمكان التعرض للمادة السامة، فإن غرف المعيشة والنوم كانت هي المكان في 58% من الحالات.

الخلاصة: حصلت معظم التسممات عند الأطفال قبل عمر الأربع سنوات وكانت معظمها نهائية الحدوث وأكثرها في فصل الصيف. كانت الأدوية الطبية هي معظم العوامل المسببة للتسمم وغرف المعيشة والنوم هي من أكثر الأماكن التي يتعرض فيها الأطفال للتسمم.

إن المراقبة الجيدة والمستمرة من قبل الأهل هي أساسية ولاسيما خلال العمر من 1 – 5 سنوات. وكذلك استخدام العبوات المقاومة للفتح من قبل الأطفال لتخزين الأدوية والمواد المستعملة في المنزل.

الكلمات المرجعية: التسمم، مستشفى عسير المركزي، طوارئ المستشفى.

Objective: To describe the pattern of childhood poisoning in the Emergency Room (ER) of the Pediatrics Department in Aseer Central Hospital (ACH), in order to suggest possible causes and preventive measures.

Methods: This is a retrospective study of cases of childhood poisoning or ingestions attending the pediatric emergency room of Aseer Central Hospital or those admitted to the Pediatric Department of same hospital in Abha, Kingdom of Saudi Arabia, during the period of January 2000 to December 2003. Children aged 12 years and below were included. Review of records was done to collect data on clinical information such as age, sex, type of poison, clinical condition on admission as well as the time, place and date of exposure to the offending agent.

Results: In this study, 114 poisoned children aged 12 years and below were studied. It was found that children from 2-4 years were more liable to poisoning (81%, $p<0.001$). Males were (68%) while females were (32%), with a sex ratio of 2.2:1. Medical drugs offended the most (72%, $p<0.001$). As regards clinical condition on admission, drowsiness, nausea and vomiting as well as abdominal pain represented (82%) of the cases. Daytime was when 80% of poisoned cases were admitted ($p<0.001$). The peak months were from June to August (71%, $p<0.01$). As regard the place of exposure to offending agent, living rooms and bedrooms accounted for 58% of the cases ($p<0.001$).

Correspondence to:

Dr. Mohammed A. Al-Shehri, FRCPC, Department of Pediatrics, College of Medicine & Medical Sciences, King Khalid University, P.O. Box 641, Abha, Saudi Arabia E-mail: fariss2000@yahoo.com

Conclusion: *The peak age for poisonings in children is before the age of four with significantly high diurnal frequency, significant seasonal variation in favor of summer. Medical drugs were the most common agents of poisoning, and living rooms and bedrooms the places where most poisoning occurred. Good and continuous supervision by parents is essential, especially from the age 1-5 years. There should also be legislation for the use of child resistant containers for home medicines and household agents.*

Key Words: *Poisoning, Aseer Central Hospital (ACH) and Emergency room (ER).*

INTRODUCTION

Accidental ingestion of poisons and household substances, a potential source of morbidity and mortality in children all over the world,^{1,2} is a significant public health problem. While this may be accidental, non accidental or iatrogenic in young children, it is usually deliberate among older children especially in industrialized countries.³ Most frequently, however, the ingested substances are taken accidentally. The ingested poisons can be classified into drugs (prescribed or non-prescribed), household products and plants. Their degree of toxicity may be low, intermediate or highly toxic.

The Pharmacy Services Department of ACH and College of Medicine and Medical Sciences (CMMS) at King Khalid University (KKU) has established a poison control service in conjunction with drug information center. The primary goal of the poison information service is to offer expert advice from well-trained clinical pharmacists in the management of poisoning cases throughout the Southwestern region, Kingdom of Saudi Arabia (KSA). The service is available 24 hours a day (calls received from 7:30 a.m. to 4:00 p.m.) are managed by the Drug and Poison Information Center, while after hours consultations were managed by on-call clinical pharmacologists and pharmacists. Information on poisoning management targeted physicians, even though advice is also available to other paramedical personnel and the lay public.⁴

There are publications on accidental poisoning in children in different parts of KSA,^{5,6} but as far as we know, no study has been done on accidental poisoning of children in the city of Abha, Southwestern Saudi Arabia

Therefore, this retrospective survey aims to study the patterns of childhood poisoning in ACH, Abha, KSA.

METHODS

The study collected information from the Department of Pediatrics and its Emergency Room at ACH, which is the only referral hospital in this

region of KSA (population: 1.3 million). It lies about 8500 feet above sea level. As an urban population, the people have many modern facilities but retain the basic dietary and social habits of rural communities.

Cases of poisonings were studied during the period, January 2000 to October 2003. All cases of unintentional poisoning during this period in children aged 12 or less were included. For each case, seven parameters were studied. These were: age, sex, type of poison, clinical condition during admission, time of exposure, date of exposure, and place of exposure. Every effort was made to get the optimum benefit from the available data in the patient's files. There was however, no socio-demographic information of the children and their families in the files. All data obtained from the emergency and pediatric departments' medical records of children diagnosed with poisoning, were coded and entered into IBM compatible computer of Family and Community Medicine Department at the CMMS, KKU, using the Statistical Package for Social Science software (SPSS-Version 10). The data entered was then checked for accuracy. For each item, the frequency and percentage of assessment items were presented.

RESULTS

There were 114 cases in this study, 97(85%) patients needed hospital admission and 17 (15%) patients were observed in the Pediatric ER .

Table 1 shows the distribution of 114 cases of poisoning in children in Abha. Most of these cases were of children aged 2 to 4 years ($\chi^2 = 57.6$, $p < 0.001$). Boys were significantly more represented than girls ($\chi^2 = 15.47$, $p < 0.001$), with sex ratio of 2.2:1.

Table 2 shows the distribution of cases according to some characteristics. Medicinal drugs significantly ranked first ($p < 0.001$) as a cause of poisoning (82%), followed by household products (13.2%), and petroleum products (9.6%). Most cases occurred in the child's own home, in the living room or bed room (57.9%), or in the kitchen

(36.8%). Most of the cases occurred during the day, either in the morning (35.1%) or in the afternoon (44.7%), while cases that occurred at night constituted only 20.2% ($\chi^2=37.17$, $p<0.001$). As regards the time of poisonings, about one-half of all cases (49.1%) occurred during the summer months, with a statistically significant seasonal variation ($\chi^2= 12.42$, $p<0.01$).

Table 1: Distribution of 114 poisoned children by age and sex

Characteristics	Cases No. (%)
Age (year)	$X^2=57.6$, $df=2$, $p<0.001$
1-2	14 (12.3)
2-4	92 (80.7)
Sex	Male: Female=2.2:1
Boys	78 (68.4)
Girls	36 (31.6)

Table 2: Distribution of 114 children with poisoning by some characteristics

Characteristics	No. (%)
Type of poisonous agent	$X^2=43.8$, $df=3$, $p<0.001$
Medications	82 (71.9)
Household products	15 (13.2)
Petroleum products	11 (9.6)
Others	6 (5.3)
Place of poisoning	$X^2=30.9$, $df=3$, $p<0.001$
Living room or bedroom	66 (57.9)
Kitchen	42 (36.8)
School	2 (1.8)
Other places	4 (3.5)
Time of exposure	$X^2=37.2$, $df=1$, $p<0.001$
Morning	40 (35.1)
Afternoon	51 (44.7)
Evening	23 (20.2)
Seasonal variation	$X^2=12.4$, $df=3$, $p<0.01$
December-February	13 (11.1)
March-May	23 (20.2)
June-August	56 (49.1)
September-November	22 (19.3)

Table 3: Clinical presentation of symptomatic poisoned children (percentages and confidence intervals)

Clinical presentation	No. (%)	95% CI
Drowsiness	39 (34.2)	2.5-43.3
Nausea and vomiting	46 (40.4)	31.6-49.6
Abdominal pain	19 (16.7)	10.7-24.4
Coma	5 (4.4)	1.6-9.5
Dyspnea	10 (8.8)	4.5-15.1
Sore throat	6 (5.3)	2.2-10.6

Ibuprofen was the most common (16%) of the drugs ingested, followed by Acetaminophen 14%, Acetylsalicylic acid 10% and folic acid 9%, and

unknown medications in 51%. Toilet bowl cleaners were the most commonly incriminated product in 67% of cases, followed by fingernail polish remover in 20%, soap powder in one child and Clorox (Chlorine bleach) in another child.

In this study, children who had ingested an offending agent, but had not developed symptoms represented 18% of the total number of cases as compared to symptomatic children.

Table 3 shows the distribution of symptomatic cases of poisoning according to various clinical manifestations. Nausea and vomiting (40.4%) and drowsiness (34.2%) came first, followed by abdominal pain (16.7%), and coma (4.4%) was the last.

DISCUSSION

The present retrospective study, highlights poisoning in children, which is a major health problem. The preponderance of male to female patients in this study is in line with most studies.⁵⁻⁷ Similarly, the involvement of children in the 2-4 year age group in this study agrees with worldwide findings.^{3,7} In this age range, children are curious and explorative in behavior. In some older children, hyperactivity predisposes them to poisoning at home where almost every substance is thrown into the mouth.

Medicinal products were the main cause of poisoning in the present study. Many reports particularly from other parts of Saudi Arabia, support this finding, highlighting the problem of medicine in self-poisoning.⁸⁻¹¹ However, this finding was not in agreement with the findings in some developing countries, where ingestion of household products like chlorine bleach (Clorox), pesticides, disinfectants and unidentified products ranked first.^{12,13} Some of the reasons for this finding in the present study, and those of other studies in other parts of Saudi Arabia, include the dispensing of drugs in envelopes instead of child-resistant containers, increased affluence, free medical treatment and easy access to drugs. However, it is important to note that careless storage of household products and drugs is a very important factor in the poisoning of children. The types of poisoning in the present study and substances involved were similar to those reported by other studies in Saudi Arabia and the Gulf countries.¹⁴⁻¹⁷

Regarding the type of drugs ingested by children in this study, Ibuprofen was the most common followed by Acetaminophen, Acetylsalicylic acid and folic acid 9%; 51% were unknown. Some

other studies showed that acetaminophen was the most common drug poison in children.¹⁸⁻²⁰ One of the explanations for our findings in this study is that Ibuprofen is similar to acetaminophen and can be obtained off the counter from a pharmacy. It is used by adult patients more commonly than acetaminophen as an anti-inflammatory and pain killer. Another explanation is that most of the ingested drugs were not known and few drugs were identified. Toilet bowl cleaners were the most common household products swallowed accidentally, followed by fingernail polish remover, soap powder and clorox .

The most common presenting symptoms of poisoning in this study were drowsiness, nausea, vomiting and abdominal pain (Table 3). The high prevalence of poisoning in children during summer months (June to August) in our study may be due to the influx of people into the Aseer area, especially Abha which is a popular summer resort for Saudi nationals and people from all over Gulf region. Also, poisonings have a diurnal peak of frequency, occurring most frequently in the afternoon followed by morning. The majority of children must have been out of the sight of their carers who were performing some household chores when the poisoning occurred.

Previous studies have shown that accidental poisoning in children is related to the lifestyle of the household, and some environmental factors.^{21,22} The present study showed that 95% of poisoning occurred in the child's own home where a collection of drugs, household cleaning agents and personal products are very often improperly stored. The importance of parental supervision, control and prevention of poisoning of children mentioned by other investigators²² is reinforced by our study.

In conclusion, the peak age of poisonings in children occurs before four years of age, with a significantly high diurnal frequency, significant seasonal variation in favor of summer season. Medical drugs were the most frequent agents of poisoning and living rooms and bedrooms, the more frequent places of poisoning. Ibuprofen was the most common known drug accidentally ingested followed by acetaminophen, and toilet bowl cleaners were the most common household products followed by fingernail polish remover.

Finally, it is evident that lack of safe storage of poisonous drugs and household products is an essential risk factor for the poisoning of children. As a preventive strategy, we recommend that parents must ensure that all medicates, household chemicals and toxic products are kept in a safe

place out of the reach of children. There should be legislation for the use of child resistant containers for household agents and dispensed medications. Finally, good parental supervision is always necessary. The establishment and operation of drug and poisoning information centers in every region through a network is highly recommended. All these measures are absolutely vital for the prevention of poisoning in children.

ACKNOWLEDGMENT

The author would like to thank the Clinical Pharmacist, Dr. Mostafa Mohsen and the staff at the Poison Information Center at ACH, Abha and the Department of Clinical Pharmacology, Faculty of Medicine, KKU, Abha, KSA. I am also grateful to Prof. Anwar Hamdi for his valuable suggestions and invaluable assistance in translating the abstract of the manuscript into Arabic.

REFERENCES

1. Walton WW. An Evaluation of Poisoning Prevention Packing. *Acta Paed* 1982;69:363-70.
2. Lawson GR, Craft AW, Jackson RH. Changing Patterns of Poisoning in Children in Newcastle. 1974-1981. *BMJ* 1983;37:291-5.
3. Sibert J, Davies PA. Poisoning, Accidents and Sudden Infant Death Syndrome. In: Campbell AGM, McIntosh M, editors. Forfar and Arneil's Textbook of Pediatrics. 4th edition. London: Churchill Livingstone, 1992:1777-1800.
4. Saddique A. Poisoning in Saudi Arabia: Ten-year experience in King Khalid University Hospital. *Ann Saudi Med* 201;21:88-91.
5. Mahdi AH, Taha SA, Al-Rifaie MR. Epidemiology of Accidental Home Poisoning in Riyadh, Saudi Arabia. *J Epidemiol Community Health* 1983;37:291-5.
6. El-Mouzan MI, Elageb A, Ali NK. Accidental Poisoning of Children in the Eastern Province. *Saudi Med J* 1986;7:231-6.
7. Al-Sekait MA. Epidemiology of Accidental Poisoning of Children in Riyadh, Saudi Arabia. *Ann Saudi Med* 1990;10:276-9.
8. Repetto MR. Epidemiology of poisoning due to pharmaceutical products, poison control centre, Seville, Spain. *European Journal of Epidemiology* 1997; 13:353-6.
9. Chan TY, Crithley JA. Hospital admission due to acute poisoning in the new territories, Hong Kong. *Southeast Asian Journal of Tropical Medicine and Public Health* 1994;25:579-5.
10. Blanc PD, Kearney TE, Olsen R. Under-reporting of fatal cases to a regional poison control center. *Western Journal of Medicine* 1995;152:505-9.
11. Khan LA, Khan SA, Al-Hateeti HS. Clinical profile and outcome of poisoning in Jajrana. *Annals of Saudi Medicine* 2003;23: 205-7.
12. Basavaraj DS, Forster DP. Accidental Poisoning in Young Children. *J Epidemiol Community Health* 1982;36:31-4.
13. Al Sadoom I, Yacoub A, Abdul-Karim M. Accidental Poisoning Among Children in Basrah. *J Fac Med* 1988;30:105-12.
14. Izuora GI, Adeoye A. A seven-year review of accidental poisoning in children at a Military Hospital in Hafr Al-

- Batin, Saudi Arabia. *Annals of Saudi Medicine* 2001; 21(1-2): 13-15.
15. Litavitz TL, Klein-Swartz W, Dyer KS, et al. 1997 Annual Report of the American Association of Poison Control Centers Toxic Exposure. Surveillance System. *Am J Emerg Med* 1998;16:443-97.
 16. Falaki NN, Fernando NP. Acute Poisoning in Children. One Year One Hospital Experience. *J Kwt Med Assoc* 1986;20:3-11.
 17. Litavitz TL, Manoguerra A. Comparison of Pediatric Poisoning Hazards: An Analysis of 3.6 Million Exposure Incidents. *Pediatrics* 1992;89:999-1006.
 18. Boe GH, Haga C, Andrew E, Berg KJ. Paracetamol poisonings in Norway 1990-2001. *Tidsskr Nor Laegeforen* 2004;124(12):1624-8.
 19. Moller LR, Nielsen GL, Olsen ML, Thulstrup AM, Mortensen JT, Sorensen H. Hospital discharges and 30-day case fatality for drug poisoning: a Danish population-based study from 1979 to 2002 with special emphasis on paracetamol. *Eur J Clin Pharmacol.* 2004;59(12):911-5 :
 20. Ott P, Dalhoff K, Hansen PB, Loft S, Kisely SR, Lawrence D, Preston NJ. The effect of recalling paracetamol on hospital admissions for poisoning in Western Australia. *Med J Aust* 2003;178(2):72-4 .
 21. Aziz BH, Zulkifli HI, Kasim MS. Risk Factors for Unintentional Poisoning in Urban Malaysian Children. *Am Trop Paediatr* 1993;13:183-8.
 22. Towner E, Dowswell T, Jarirs S. Reducing Childhood Accidents. The Effectiveness of Health Promotion Interventions: A Literature Review. London: Health Education Authority; 1993.