PATTERNS OF ACCIDENTAL POISONING IN KERBALA TEACHING HOSPITAL FOR CHILDREN

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Abstract

Accidental poisoning in children is a potential source of morbidity and mortality all over the world. The patterns of poisoning are usually differ from country to country and from province to another within the same country. The shortage of publications on this subject in Iraq necessitated this study, to determine the pattern of accidental poisoning in children in Kerbala Teaching Hospital for Children, Kerbala. The medical records of children 12 years and below who were admitted to the hospital for the period from the 1st of January to the 31st of December 2005 were retrospectively reviewed for relevant data. 175 cases of accidental poisoning was admitted to the hospital during the study period, representing (1.1 %) of total hospital admissions. 137 (78.3 %) of the children were from Kerbala city, and only 38 (21.7 %) children were from the surrounding regions. The age group mostly affected was 1 to 3 years (70.9%). poisoning with Kerosene was the commonest type (76%) followed by drugs (11.4%). There were clear seasonal variations and most cases were admitted during the summer and autumn months (61.1%). No deaths were reported. The results were presented and compared with previous studies in other parts of the country and the world. Continuous education of parents and caregivers of young children is recommended, as this would help to reduce the chances and complications of accidental poisoning.

أنماط التسمم العرضي في مستشفى كربلاء التعليمي للأطفال

الخلاصة

يعتبر التسمّم العرضي في الأطفال مصدر محتمل من مصادر المرضية والفناء في جميع أنحاء العالم. إنّ أنماط التسمّم تختلف عادة من بلد إلى بلد ومن محافظة إلى أخرى ضمن نفس البلد. إنّ نقص المنشورات عن هذا الموضوع في العراق إستوجب هذه الدراسة لتحديد نمط التسمّم العرضي عند الأطفال في مستشفى كربلاء التعليمي للأطفال في محافظة كربلاء. تمت دراسة السجلات الطبية للأطفال ١٢ سنة فمادون الذين أُدخلوا إلى المستشفى للفترة من أوّل كانون الثّاني إلى الحادي والثلاثون من كانون الأول لسنة ٢٠٠٥، بشكل ذو أثر رجعي للبيانات ذات العلاقة. ١٧٥ حالة من حالات التسمّم العرضي أُدخلت إلى المستشفى أثناء فترة الدراسة، تمثل (١،١ %) من دخول المستشفى الكليِّ. كان هناك ١٣٧ (٣،٧٨%) طفل من مدينة كربلاء، وفقط ٣٨ (٧،٢١ %) طفل كانوا من المناطق المحيطة بالمدينة. المجموعة العُمرية المتأثرة في الغالب كانت من ١ إلى ٣ سنوات (٧٠،٩ %) و كان التسمّم بالنفط الأبيض هو النوعَ السائد (٧٦ % من الحالات) يليه التسمم بالأدوية (١١،٤ %). كان هناك تغيرات موسمية واضحة وأكثر الحالات أدخلت أثناء الشهور الصيفية والخريفية (١،٦١ %). لم تسجل وفيات بسبب التسمم أثناء فترة الدراسة. تم عرض النتائج و مقارنتها مع دراسات سابقة في مناطق أخرى من القطر والعالم. إن التوعية المستمرة للآباء ومقدمي الرعاية للأطفال أمر موصّى به، حيث يساعد على تَقليل فرص حدوث وتعقيدات التسمّم العرضي.

Key words: Poisoning, Accident, Kerbala

Introduction

Accidental ingestion of poisons and household substances is a potential source of morbidity and mortality in children in the developed and developing countries.(1-9) Whereas this ingestion can be accidental, intentional or iatrogenic in young children, it is usually deliberate among older children, especially in the developed countries.(10,11) Most frequently, the ingested substances are taken accidentally. The ingested substances can be classified into household products, drugs and plants. Their degree of toxicity may be low, intermediate, or potentially toxic. In general the agents that are involved in poisoning differ from country to country and even from province to another within the same country.(1,3,5-9) Thus, special epidemiological surveillance for each country is necessary to determine the problem according to which preventive measures can be taken.

In the developed countries children usually ingest drugs, household products (e.g. bleaches, detergents, disinfectants and petroleum distillates), alcohol, garden plants and seeds. While in the developing countries the pattern is rather different, with accidental poisoning with hydrocarbons (especially kerosene/paraffin) and traditional medicines, snake bites and insect stings is more common. (11)

There are only few epidemiological studies on accidental poisoning among children in Iraq (12-14), and no one was conducted in Kerbala city. This retrospective review aims to document the pattern of childhood poisoning at the Kerbala Teaching Hospital for Children (KTHC), and to compare the results with studies from other parts of Iraq and the world.

Patients and Methods

A retrospective review was conducted for all poisoned children under 12 years of age, except for cases of food poisoning, who were admitted to the pediatric medical ward of KTHC through the Emergency Room (ER). These included children who were resident in Kerbala city, which has modern infrastructural and housing facilities and those coming from the nearby regions. Except for a very few doubtful cases, all poisoned children with intermediate, or potential toxicity seen at the ER were admitted to the ward for treatment, care or observation due to lack of space in the ER.

The review of case notes covered the period from the 1st of January to the 31st of December 2005. Information was recorded as to age and sex of the children, type of poisoning, and residency. As well, the clinical manifestations, complications, outcome and duration of stay in the hospital were documented. The monthly, seasonal variations in occurrence were also noted for poisoning in general and for each type of poisoning alone.

Results

The total number of accidental poisoning admitted to KTHC during the study year were 175 cases, representing (1.1 %) of total hospital admissions (15,902) cases. There were 112 males and 63 females, giving a male to female ratio of 1.8:1. The majority of children were between 1 to 3 years of age (124 or 70.9 %), with only 12 (6.9 %) below 1 year and 39 (22.2 %) above the age of 3 years. Figure 1 show the age and sex distribution.

Table 1 gives a summary of the types of poisons involved. Kerosene ingestion accounted for 133 cases (76 %), drugs involved in 20 cases (11.4 %), other household substances accounted for 11 (6.3 %) and scorpion stings involved in 9 (5.1%). There was one case of carbon monoxide, one smoke inhalation and no cases of plant poisoning. Regarding drugs, anticonvulsants were the most commonly ingested (4 cases or 20 %) followed by Antidepressants, Antihistamines, Antidiarrhoeals and Aspirin with (10 %) for each. Table 2.

About 30% of the children were asymptomatic or not documented as having

any severe symptoms. The most common symptoms and signs included cough, tachypnea, tachycardia, drowsiness, irritability, fever, and abdominal pain. More serious complications were observed in children with chemical pneumonitis following kerosene ingestion, which occurred in 33 children (24.8 % of kerosene ingestion). From all children, 57 cases (32.6 %) were discharged against medical advice and the 118 cases (67.4 %) were discharged improved. No deaths were recorded.

Regarding regional distribution, 137 (78.3 %) of the children were from Kerbala city, and only 38 (21.7 %) children were from the surrounding regions. There were clear seasonal variations in the cases of accidental poisoning over the study period (especially for those with kerosene ingestion). More admissions were made during the summer and autumn months (107 or 61.1%) than in winter and spring (68 or 38.9%). The peak presentation for the poisoned children was during June (25 or 14.3 %), while for kerosene ingestion were during August and October with 17 cases for each. Figure 2

Discussion

The present study shows that accidental poisoning in children is an important health problem, constituting about 1.1 % of the total number of admissions to the pediatric ward over one year. This value is seems to be slightly lower than that reported from other parts of the country,(12) and the world,(3,5,9) although food poisoning and the few doubtful and asymptomatic cases discharged from the ER were not included in the study. Here we should not forget the fact that much minimal ingestion at home may not warrant a visit to the hospital and therefore, the true incidence may be higher than reported here. The predominance of male to female patients in the ratio of 1.8:1 is in line with most studies in Iraq,(12,14) and surrounding countries,(1-3) although in some countries of far Asia there was a slight female predominance,(15,16) however, the sex of the child was not found to influence poisoning.(17) The involvement of children in the age groups 1 to 3 years agrees with findings worldwide.(3,8,11-13) In this age range, children are curious and often explorative in behavior. In some older children, hyperactivity predisposes to poisoning at home. In general children less than 5 years of age have tendency to put different items into their mouths, predisposing them to accidental poisoning.(11) There was no case of deliberate poisoning in my study in view of the age ranges involved, since it usually involved older children,(10) and also due to the rarity of this behavioral pattern in this part of the world.

Like other previous studies conducted in Iraq, the present study showed that the majority of children ingested household products.(12-14) Kerosene alone was implicated in 133 (76%) cases, while drugs involved in only 20 (11.4%) cases, Table 1. These findings appear to be similar to those found in developing countries.(3,5) While unlike some surrounding countries where drugs represent the most common causative agent of poisoning, in a pattern similar to that of developed countries, as in Jordan,(1) Saudi Arabia,(18) Turkey,(6) and Iran.(7) This seems to be due to the change in the people life style of most of the surrounding countries except Iraq, due to the effects of repeated wars and continuous security, economic, and social problems during the last 25 years. Kerosene is a common multipurpose household chemical that represent the major source of heating fuel in Iraq. It is available in all houses of Iraqi families and was found to be improperly stored in their kitchens, gardens and even living rooms of some houses. Kerosene is also found to be stored in different containers, some of them designed for domestic use of water and kept at reachable levels. Although previous studies reported kerosene as the most common causative agent in accidental poisoning in children in Iraq, but it never exceed the 56% of total causative agents.(12-14) This is the first study in which kerosene involved in more than 75% of children, which is very

high percent worldwide. This recent increase in the incidence rate of kerosene poisoning is appearing to be due to the application of new system in supplying kerosene to Iraqi families. The system applied by the government in 2004 and included the supply of 200 litters of kerosene at once for each family each year. Most families were not prepared to store such large quantities in safe conditions, which resulted in this high incidence compared with the past years. With regard to poisoning due to drugs, Anticonvulsants were the most commonly ingested followed by Antidepressants, Antihistamines, Antidiarrhoeals and Aspirin. Table 2. This pattern is slightly differ from other countries, where analgesics were the most commonly ingested drugs.(1,2) The involvement of scorpion stings in 9 (5.1%) cases is expected, since Kerbala city is surrounded by many farms and desert lands.

The occurrence of respiratory symptoms in the majority of patients was due to kerosene ingestion. The respiratory system is the main target organ affected by kerosene poisoning.(19) chemical pneumonitis occurred in about 25% of children with kerosene ingestion, and was diagnosed by CXR and supportive clinical manifestations. This seems to be lower than the rate of occurrence in other countries; Jordan 67.3% (19) and Austria 40% (20). Although all patients with kerosene pneumonitis were improved and discharged with no obvious morbidity, subsequent follow up should be arranged before discharge. Since residual lung damage after kerosene pneumonitis is possible.(21) An interesting finding is that no death reports were observed during the study period, while the mortality rate due to acute poisoning was reported from Erbil city to be 0.3% (2/541) (14), and from Ramadi city to be 0.4% (1/239) (13). This could be due to the small population of the cases in this study which was in accordance with a Jordanian study. (1)

Regarding regional distribution, there were no clear differences in the pattern of poisoning between rural and urban areas, with kerosene ingestion still the major problem. This is because of the increased need for hydrocarbons in all parts of the country due to lack of electrical power supply in Iraq, and also the governmental supply of kerosene involved both rural and urban areas

The incidence rate of poisoning in children, especially with kerosene, was known to be increased during summer months in Iraq (22), and other countries. (19) In the present study, in addition to the peak presentation during the summer months, another peak was recognized in early winter. Fig 2 This is may be because the supply of kerosene in some areas of Kerbala city was extended during winter months.

Conclusion

The results of the present study show that, the pattern of accidental poisoning in children has been changed with dramatic increase in the incidence rate of kerosene poisoning in the last few years. Change in the seasonal distribution of poisoning was also observed. Further recent studies in other Iraqi cities is strongly recommended to evaluate this problem. In comparison with the surrounding countries, the study showed that Iraq still have the poisoning patterns of developing countries, where accidental poisoning is mostly associated with lack of education and poor socio-economic status. Therefore a poisoning prevention program should be an integral part of the health planning in Iraq.

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References

1. Hussein A Bataineh, Ahmed M Bataineh. Childhood accidental poisoning in Tafila. Iran J Ped 2007, 17 (1), 23.

2. Murad Massadeh. The pattern of accidental drug poisoning in children. MEJFM 2007, 5 (4-5), 19.
3. Syeda Akhtar, Gulati Raj Rani, Fahad Al-Anezi. Risk factors in acute poisoning in children – A retrospective study. Kuwait Med J 2006, 38 (1), 33.
4. Flanagan RJ, Rooney C, Griffiths C. Fatal poisoning in childhood, England & Wales 1968-2000**.** Forensic Sci Int 2005, 148 (2-3), 121.
5. Basu K, Mondal RK, Banerjee DP. Epidemiological aspects of acute childhood poisoning among patients attending a hospital at Kolkata**.** Indian J Public Health 2005, 49 (1), 25.
6. Andiran N, Sarikayalar F. Pattern of acute poisoning in childhood in Ankara. Turk J Pediatr 2004, 46 (2), 147.
7. Afshari R, Majdzadeh R, Balali-Mood M. Pattern of acute poisonings in Mashhad, Iran 1993-2000. J toxicol clin toxicol 2004, 42 (7), 965.
8. Yates KM. Accidental poisoning in New Zealand. Emerg Med (Fremantle) 2003, 15 (3), 244.
9. Lamireau T, Llanas B, Kennedy A, Fayon M, Penouil F, Favarell-Garrigues JC, Demarquez JL**.** Epidemiology of poisoning in Children: a 7-year survey in a paediatric emergency care unit. Eur J Emerg Med 2002, 9 (1), 9.
10. Forfar and Arneil's. Textbook of Pediatrics, 6th edition. 2003, 1695.
11. Tim Meredith. Epidemiology of poisoning. Med International 1995, 23 (1), 1.
12. Mohamed Mojar Al-Shamsi. Patterns of poisoning in children in Qadisiyah. J Fac Med (Baghdad) 2001, 43 (3), 367.
13. Ali Fakhri J, Lafi Majid A, Ali Halla M. Accidental childhood poisoning in Ramadi city. J Fac Med (Baghdad) 1997, 39 (1), 24.
14. Mohamed Mohamed M, Hashim Hashim M, Jaff Hama N. Accidental poisoning of children in Erbil province. Ann Coll Med Mosul 1988, 14 (1), 55.
15. Paudyal Bp. Poisoning: pattern and profile of admitted cases in a hospital in central Nepal. J Nepal Med Assoc 2005, 44 (159), 92.
16. Pillai GK, Boland K, Jagdeo S, Persad K. Acute poisoning in children. Cases hospitalized during a three-year period in Trinidad. West Indian Med J 2004, 53 (1), 50.
17. Paritsis N, Pallis D, Deligeorgis D, Doxiadis S, Phylactou C, Vlachonicolis I. An epidemiological study of the factors influencing

poisoning in children aged 0-5 years. Paediatr Perinat Epidemiol 1994, 8 (1), 79.

18. Afrah Kashmar, Aftab S. Chishti. Spectrum of childhood poisoning in a tertiary center in the Eastern Saudi Arabia. Saudi Med J 2004, 25 (1), 117.
19. Ali M. Shotar. Kerosene poisoning in childhood: A 6-year prospective study at the Princess Rahmat Teaching Hospital. Neuroendocrinol Lett 2005, 26 (6), 835.
20. Thalhammer GH, Eber E, Zach MS. Pneumonitis and pneumatoceles following accidental hydrocarbon aspiration in children. Wien Klin Wochenschr 2005, 117 (4), 150.
21. Tal A, Aviram M, Bar-Ziv J, Scharf SM. Residual small airways lesions after kerosene pneumonitis in early childhood. Eur J Pediatr 1984, 142 (2), 117.
22. Nagi Na, Abdulallah ZA. Kerosene poisoning in children in Iraq**.** Posgrad Med J 1995, 71 (837), 419

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Table (1) Summary of the types of poisons.

Agent	*No. of cases*	*%*
Kerosene	133	76
Drugs	20	11.4
Scorpion stings	9	5.1
Gasoline	5	2.7
Diesel	2	1.2
Pesticides	2	1.2
Hydrogen peroxide	2	1.2
Carbon monoxide	1	0.6
Smoke inhalation	1	0.6
Total	***175***	***100***

Table (2) Types of drugs involved in the poisoning.

Drug	*No. of cases*	*%*
Anticonvulsants	4	20
Antidepressants	2	10
Antihistamines	2	10
Antidiarrhoeal	2	10
Aspirin	2	10
Antihypertensives	1	5
Iron	1	5
Paracetamol	1	5
Multivitamins	1	5
Unidentified	4	20
Total	***20***	***100***

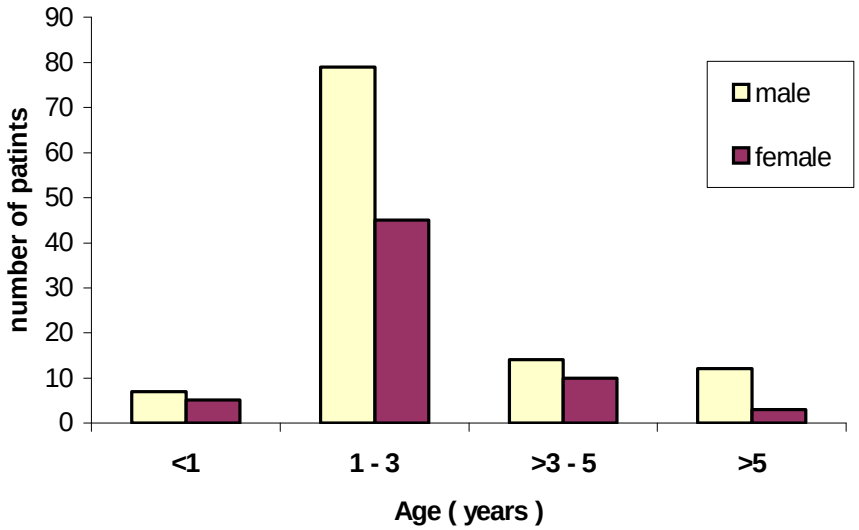

Figure 1. Age and sex distribution in the 175 cases of poisoning

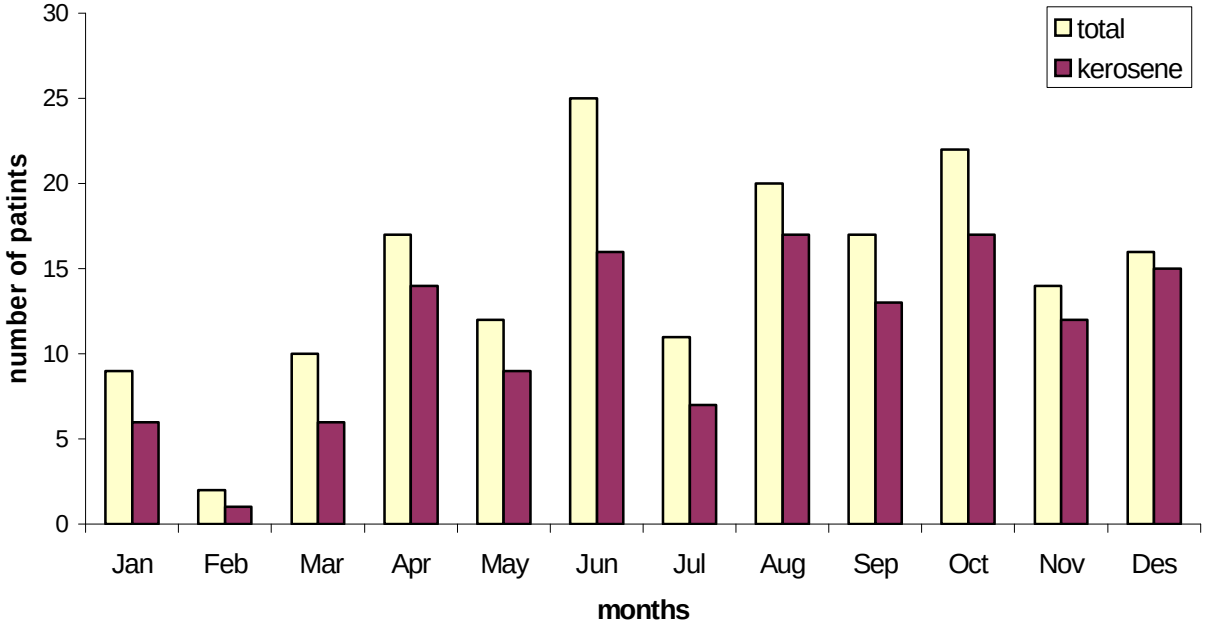

Figure 2. Seasonal distribution of childhood poisoning including those with kerosene