

Developmental risk factors for unintentional childhood poisoning

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ABSTRACT

Objective: To identify main risk factors for unintentional childhood poisoning in Ahwaz, Iran and to suggest possible causes and preventative measures.

Methods: This is an epidemiological description and a case-control study. The study was undertaken in Ahwaz, Iran in 1996-1997. Cases were 100 children who were taken to one of the 17 Accident and Emergency Departments due to poisoning. For every case two controls were selected. Age, gender, hospital and date of attendance to Accident and Emergency Department were matched between cases and controls. All parents of the children were interviewed by using a questionnaire that included demographic and poisoning characteristic information.

Results: Children without adult supervision (odds ratio = 4.8), and those with previous poisoning (odds ratio = 5.2)

were at increased risk of poisoning ($P < 0.05$). Drug poisoning was more common among children (60%), and most poisoning occurred inside the home (89%). Boys (65%), and children aged 2-4 years (79%) had more poisoning than others. In 75% of cases, poisonous products were accessible.

Conclusion: Adequate parental supervision and safe packing, storage and disposal of potentially hazardous substances could be the most important activities for prevention of childhood poisoning. Furthermore, manufactures and traders must by law put certain toxic household products and drugs in child resistant containers, and mark toxic medicines with warning labels or signs.

Keywords: Poisoning, children, risk factors.

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Accidental injuries and poisoning are one of the most important cause of deaths among children over the world today.^{1,5} Poisonings are responsible for about 5% of all injury deaths in developing countries.² In many countries the number of fatalities as a result of poisoning has been reduced over the past years,^{1,2} however, hospital admissions for poisonings have increased in recent years.⁶⁻⁸

The pattern of poisonings have changed during the past years.^{9,10} This change follows due to new poisonous products, higher accessibility and exposure of children and the increasing of new consumer products.⁹ The fatality rate of poisoning is about one in 1000.^{11,12} Research on unintentional childhood poisoning identified the behavioral factors such as curiosity or hyperactivity as the major risk

factors.^{13,14} In practice, child resistant packaging of agents has been shown to be effective to reduce poisoning injuries.¹⁵⁻¹⁷ There is little research on epidemiology of unintentional childhood poisoning in Iran, and no previous study identified child and family related risk factors by using a case-control study. In this study the related risk factors for childhood poisoning is presented, and the epidemiology of such injuries among children living in Ahwaz, Iran is described.

Methods. This case-control study collected information from 17 hospitals in Ahwaz, the capital of Khuzestan province of Iran. For inclusion the injury (case) had to be unintentional poisoning and

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Table 1 - Distribution of childhood poisoning in Ahwaz, Iran by type of poisoning agent, place, storage and parental supervision at the time of poisoning (n=100).

	Number (%)
Type of poisoning agent	
Medication	60 (60%)
Cigarettes	13 (13%)
Pesticides	12 (12%)
Petroleum products	5 (5%)
House cleaning products	3 (3%)
Others	7 (7%)
Place	
Living room/bedroom	53 (53%)
Kitchen	35 (35%)
Yard/garden	7 (7%)
School	2 (2%)
Other places	3 (3%)
Storage	
Accessible/unsafe	75 (75%)
Not accessible/safe	25 (25%)
Parental supervision	
Present	75 (75%)
Absent	25 (25%)

the child (aged less than 15 years) was taken to Accident & Emergency Department (A & E Dept.) between 22nd November 1996 to 20th March 1997 (21st of March is the first day of year in Persian calendar). For every case, two controls were chosen among children who were brought to the outpatient clinics of the hospitals due to a respiratory infectious or diarrhoeal disease. Controls were matched regarding to age, sex, and date of hospital attendance. An interviewed questionnaire was completed for every parent. It covered demographic, behavioral, and risk factors of accidental poisonings. For cases, data was also obtained concerning a brief description of poisoning. The definitions of external causes of injury and poisoning used in this study followed the International Classification of Diseases (E800-E999). Data was entered and analyzed using SPSS for Windows version 6.0. Descriptive analyses, odds ratios (OR), and 95% confidence interval (CI) employed were appropriate. The confounding variables such as maternal occupation (housewife or else), parental education (educated or else), current parental smoking (yes or no), family size (more or less than 4), and previous poisoning of the child were controlled using logistic regression.

Results. In this study 100 poisoned children (aged 0-15), and 200 controls were studied. Table 1 shows distribution of poisoned children by place of poisoning, storage status, parental supervision, and

type of poisoning. Most poisonings occurred in the living room or bedroom (53%), and kitchen (35%). About two-thirds of children accessed the poisoned products and were not supervised by their parents when they were poisoned. The top three poisonings were; medication (60%), cigarettes or tobacco (13%), and pesticides (12%). There were no significant differences between the above variables by age and sex of children. Table 2 shows distribution of poisoned children and control group by age, sex, maternal occupation and education, parental smoking status, family size, and child's previous poisoning. About two-thirds of children were toddlers aged 2-4 years. Boys were more likely poisoned than girls (65% vs. 35%, $P<0.001$), and there was a significant difference between poisoning occurrence and parental supervision ($P<0.01$), and previous poisoning of the child ($P<0.05$). More poisonings occurred among children whose parents were not smoking and schooling years were of 6 or less. However, adjusted data using the logistic regression showed no statistical differences between the

Table 2 - Distribution of poisoned children and control group.

	Cases (%)	Controls (%)
Age (year)		
<1	14 (14)	30 (15)
2-4	79 (79)	153 (76.5)
>5	7 (7)	17 (8.5)
Sex		
Male	65 (65)	130 (65)
Female	35 (35)	70 (35)
Maternal education		
Primary or less	60 (60)	120 (60)
More than primary	40 (40)	80 (40)
Maternal occupation		
Housewife	87 (87)	173 (86.5)
Else	13 (13)	27 (13.5)
Parental smoking status		
Non smoker	66 (66)	127 (63.5)
Smoker	34 (34)	73 (36.5)
Family size		
<4	38 (38)	78 (39)
>5	62 (62)	122 (61)
Previous poisoning		
Yes	17 (17%)	5 (2.5)
No	83 (83%)	195 (97.5)

Table 3 - Odds ratio and 95% Confidence Interval derived from a logistic regression model.

	Odds ratio	95% CI	P-value
Maternal occupation			
Housewife	-		
Else	1.4	0.6-2.6	0.64
Maternal education			
Primary or less	-		
More than primary	1.1	0.6-1.8	0.85
Parental smoking status			
Non smoker	-		
Smoker	1.2	0.7-2.1	0.45
Family size			
<4	-		
>5	1.2	0.6-2.0	0.73
Previous poisoning			
Yes	-		
No	5.2	1.1-26.5	0.05
Parental supervision			
Yes	-		
No	4.8	0.9-26.0	0.01
CI-Confidence Interval			

children's poisoning occurrence and these variables (Table 3). There were also no significant differences between cases and controls regarding to different variables used in this study. Children without adult supervision (odds ratio (OR) = 4.8; 95% CI= 0.9 to 26), and those with previous poisoning (OR=5.2; 95% CI = 1.1 to 26.5) were at increased risk of poisoning.

Discussion. This case-control study showed that lack of parental supervision and previous poisoning of children are the major risk factors for childhood poisonings in Ahwaz, Iran. This study was carried out on 100 poisoned children and 200 matched controls. I was unable to show the incidence rate of poisoning in Ahwaz. However, occurring 100 cases within 4 months may give us an estimation of the childhood poisoning in this city (with about 300,000 children population). Previous studies showed that accidental poisoning in children are related to the life-style of the households, and the environmental factors.¹⁸⁻²⁰ Therefore, the differences

between my findings and others' results might be because of the variations in different communities. The importance of parental supervision on control and prevention of childhood poisonings has been studied by other authors,²⁰ reinforced by this study. Some studies showed a significant difference between childhood poisoning with sex and age of the children.^{8,21} This study showed that boys and toddlers (2-4 years) were more likely to be poisoned compared to girls and other age groups. In this study as in others,^{20,22} children with poisoning experience were at increased risk for current poisoning. However, more studies are needed to show these implications. Lack of safe storage of poison products for about two-thirds of cases in this study would be an essential risk factor for childhood poisoning. As a prevention strategy, parents must ensure that all medicates, chemical households, and toxic products are kept in a safe place out of the reach of children, and teach them how to recognize toxic products. Furthermore, manufactures and traders must by law put certain toxic household products and drugs in child resistant containers, and mark toxic medicines with warning labels or signs.

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