FACTORS LEADING TO ACUTE ACCIDENTAL POISONING AMONG CHILDREN PRESENTING IN PEDIATRIC EMERGENCY OF A TERTAIRY CARE HOSPITAL

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ABSTRACT

Objective:

- To determine the frequency of risk factors leading to acute accidental poisoning in children presenting in emergency of a tertiary care hospital.

Material and Methods:

- This study was conducted from 20th April 2012 to 19th Oct 2012 in Pediatric ward emergency, Jinnah Hospital, Lahore. There were 200 patients included in this study presented to emergency department with poisoning.

Results: A total of 200 patients were included. Age ranged from 1 year to 8 years with a mean age of 3.49 years and standard deviation (SD) of ± 1.77 years. Majority patients were upto 5 years of age 82.5%(165) and the patients above 5 years were 17.5%(35). Male were predominantly involved 76%(152) and females were 24%(48). There was easy access to poison in 84.5%(169) of the cases. Most of the mothers were illiterate or had education less than middle 71%(142). There were 29%(58) mothers who had education more than middle. Large family size with 3 or more kids were 66.5%(133) and families with less than 3 kids were 33.5%(67). Those with poor socioeconomic status (income per month less than 8250 Rs) were 73.5%(147). There were 77.5%(155) mothers who did not had awareness about toxic effects of the poison. Storage at common places was in 88%(176). Common places of storage were: kitchen 38.5%(77), understairs 21%(42), bedroom 15.5%(31), bathroom 6.5%(13) and elsewhere (roof, floor etc) 6.5%(13). Mother's distraction was found in 91.5% (183) of the cases.

Conclusion: Male sex, age less than five years, easy access to poisonous substance, family size three or more kids at home, poor socioeconomic status, lack of maternal awareness about toxic effects of poison, storage at common places and mother's distraction were factors leading to acute accidental poisoning in this study.

Key Words: Poisoning, Kerosine Oil, Organophosphorous.

INTRODUCTION

"Poison" is a substance capable of producing damage or dysfunction in the body by its chemical activity. It can enter the body in various ways to produce general or local effects.[1,2]. "Poisoning" is exposure of an individual to a substance that can cause symptoms and signs of organ dysfunction leading to injury or death.[3,4] Accidental poisoning is implicated in about 2% of all injury deaths in children in developing countries.[3] At least 2,000,000 childhood ingestions per year come to the attention of the health professionals of United States in the wake of billion of containers of toxic substances with thousands of variations in name and content. Poisoning represents a relatively frequent problem in Pakistan affecting majority of children. Kerosene oil, insecticides and drugs are main substances responsible for accidental poisoning and leading to complications, mainly due to improper storage, easy accessibility and suboptimal supervision. Children below 5 years of age are affected, mainly due to their innovative and exploratory nature and mouth tendencies. The causes and types of poisons vary in different parts of the world depending on accessibility of poisoning to children which depends upon factors such as demography, socio-economic status, education, local belief's and customs.[5,3,6,7].

In our country, the family size is large and accommodation small. Poisonous substances are kept in easily accessible places. This, combined with a lack of supervision by the parents is one of the main reasons for the appreciable number of cases of poisoning admitted to this hospital. [8,9]. The various toxic ingestions included are kerosene oil, most common in developing countries of South Asia and some parts of Africa, followed by organophosphorous compounds like pesticides especially in a country like Pakistan because of the lack of safety measures from manufacturers to caregivers. Other hazardous compounds used by young

children out of inquisitiveness are pharmaceuticals like cough/cold preparations to sedatives/hypnotics. According to WHO, mortality in children upto 4 years of age varies between 0.3 to 7% per 100,000 populations in different countries of the world.[9,1,10,].

Poisoning in children is the twelfth most common cause of admission to the pediatric ward. It constitutes 0.23 to 3.3% of total poisoning cases and the case fatality rates range from 0.64 to 11.6%.Accidental poisoning commonly involves children below 5 years of age and hydrocarbon(kerosene) is the commonest orally consumed poison in children. The products are inappropriately stored in drinking glasses, water bottles or unlabeled containers.[7,11]

Accidental poisoning by insecticides such as the organophosphates and carbamates remains an important public health problem in regions where these agents are in common usage. Drugs are the main cause of poisoning, but unintentional poisoning is most commonly caused by the ingestion of household cleaning products, pesticides or corrosives. Several of these products such as bleaches, pesticides, corrosive substances, surfactants and others are complex mixtures of chemicals with an extensive range of toxic potentials. Bleaches, petroleum derivates and pesticides were the products that were most commonly involved .(18,25,44,57,97)

The World Health Organization (WHO) estimates that total number of acute unintentional poisonings throughout the world ranges from 3.5–5.0 million cases annually, of which 3.0 million are severe poisonings resulting in 20 000 deaths annually.[12] The most recently published data from the American Association of Poison Control Centers (AAPCC) show that in 2006 there were more than 2.4 million reported poisoning exposures in the United States[13]. Although the number of child poisoning deaths have declined dramatically over the last 40 years, there is little evidence that shows a similar decline in emergency department presentations and hospitalizations, despite the prevention strategies implemented over that period. Different studies show that poisoning in the pediatric population accounts for 0.23 to 3.3 percent of all poisonings. Seventy percent of acute poisoning occurs in the pediatric population and 90% of these poisonings are easily preventable. Typically, 95 to 97% of poisonings are accidental, which is the most common case for children under 5 years of age (45-75%). In this age group, boys are more frequently affected. [14] The purpose of this study was to evaluate different factors which are common in our setup regarding accidental poisoning in children. We have given some suggestions to prevent such cases.

MATERIAL AND METHODS

The study was conducted from 20th April 2012 to 19th Oct 2012 in Paediatric ward emergency, Jinnah Hospital, Lahore. This was a Cross sectional survey. Sample was collected by non-probability way. There were 200 patients included in this study of both genders age 1 to 13 years presented to pediatric emergency with acute accidental poisoning. Confidence level of the study was 95% and margin of error 3.5%. Children presenting in paediatric emergency with suicidal or homicidal poisoning assessed on history, Children having history of poison exposure through other routes like ocular or nasal and history of snake bite, insect sting were excluded. The 200 subjects those fulfilling the inclusion criteria were recruited for the study. After identification of acute accidental poisoning, immediate management as required was given and patient stabilized. An informed consent, a complete history and examination were recorded from the attendants. Information was taken about name, age, gender, family size, education of the mother, socioeconomic status, maternal awareness about poison, mothers distraction, storage of poison (kitchen, understairs, bathroom, living room etc) and easy access to poison (in soft drink bottle, mineral water bottle, glass/cup, used plastic bottle).Information was collected and data was entered in SPSS version16. Mean and standard deviation calculated for quantitative variables like age. Frequencies and percentages calculated for qualitative variables such as gender and risk factors like maternal education, poor socioeconomic status and maternal knowledge about toxic effects, mothers distraction, storage place, age< 5 years, family size and easy access to substance. As it is a descriptive study, no test of significane was applicable.

RESULTS

A total of 200 patients were included in this study of frequency of risk factors leading to acute accidental poisoning during sex months. Age ranged from 1 year to 8 years with a mean age of 3.49 years and standard deviation (SD) of ± 1.77 years.

Majority patients were upto 5 years of age 82.5%(165) and the patients above 5 years were 17.5%(35). Most common age group involved (1-3 years) was 54%(108). Children (3.1 to 6 years) were 37%(74) and those above 6 years were 9%(18). Male were predominantly involved 76%(152) and females were 24%(48) **(Table 1)**.

There was easy access to poison in 84.5%(169), like storage of substance in cold drink bottles, used plastic bottles, mineral water bottles, cups and open containers **(Table 2)**. Most of the mothers were illiterate

or had education less than middle 71%(142). There were 29%(58) mothers who had education more than middle **(Table 3)**. Large family size with 3 or more kids was in 66.5%(133) and families with less than 3 kids were 33.5%(67). Those with poor socioeconomic status (income per month less than 8250 Rs) were 73.5%(147). There were 77.5%(155) mothers who did not had awareness about toxic effects of the poison. Storage at common places was in 88%(176). Common places of storage were: kitchen 38.5%(77), understairs 21%(42), bedroom 15.5%(31), bathroom 6.5%(13) and elsewhere (roof, floor etc) 6.5%(13) **(Table 4)**. Mother's distraction like being busy in cooking, washing, using bathrooms, cleaning home and watching TV was found in 91.5% (183).

Table I

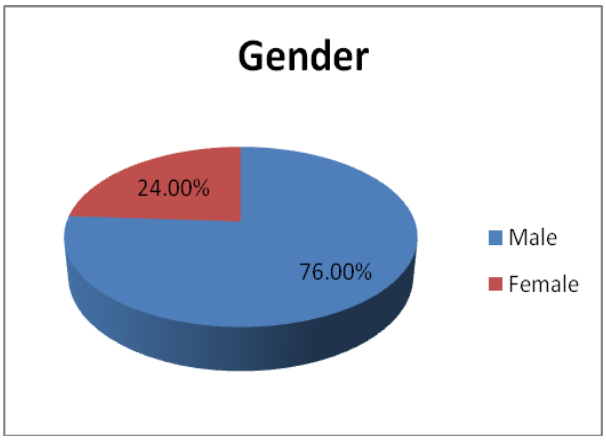


Table 2:

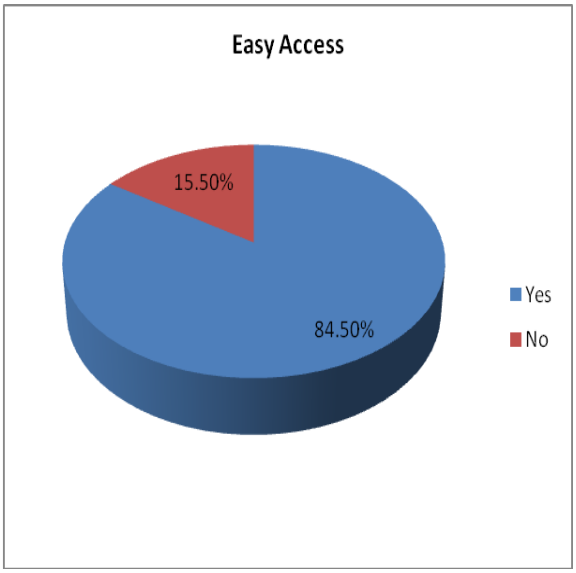
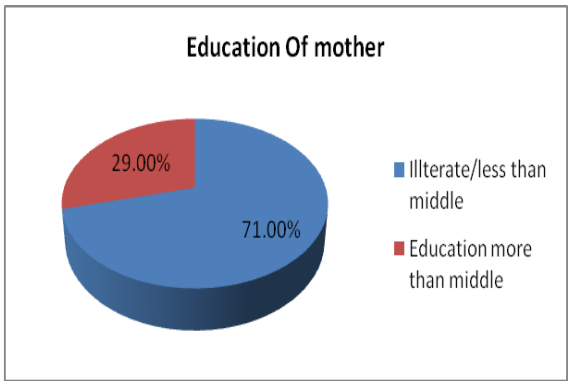
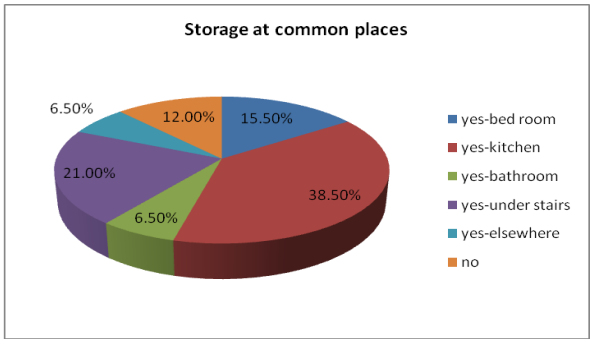


Table 3:



Male sex, age less than 5 years, easy access to poisonous substance like in cold drinks bottles, cups, mineral water bottles, used plastic bottles etc, illiterate mothers or education less than middle, family size 3 or more kids at home, poor socioeconomic status, lack of maternal awareness about toxic effects of poison, storage at common places like kitchen, bedroom, bathroom etc and mother's distraction were factors leading to acute accidental poisoning in this study.

Table 4:



DISCUSSION

Accidental poisoning in still a common problem for the physicians who provide primary care. Imperfect prevention programme fail to protect all young children, particularly those between age of 1 and 5 years who tend to include oral sampling of these products in their developmental experiences.·Fortunately, although the samplings are frequent, the amount ingested are usually of low toxicity and the actual number of deaths and permanent injuries are relatively small.

It is an important health issue, which has significant cost both financial and emotional as it is largely an accidental phenomenon. Acute poisoning in children is a major preventable cause of morbidity and mortality. It is a world-wide problem although the nature of poison consumed may vary in developed and underdeveloped countries due to variable accessibility.[9,6,10] This study

was carried out at paediatric unit for a period of 6 months. Total number of children in acute accidental poisoning included were 200. The study was done to determine the frequency of different factors leading to accidental poisoning. Children upto 5 years of age with poisoning were 82.5%. This is comparable to a study done by Bader-un-Nisa in which children who were below 5 years were 83%.[15] In another study made by G N Lucas, children with age less than 4 years were 75 %.[16]. There are other studies which show almost similar results.[1]

Male children were predominantly involved in poisoning due to their impulsive & exploring nature. Total 76% were male children who had accidental poison ingestion. Aqeel M and Munir A did a study in which 69% were male children.[3]. Another study done by Emad-ud-din Siddiqui showed that 79% cases of poisoning were male children.[3,17] Our experience was favored by the results of various studies.[18,19]. Easy access to poisonous substance like keeping it in beverage bottles, used plastic bottles, mineral water bottles and non-resistant containers was a common risk factor during study. In 84.5% of cases, children had easy access to the substance. Nabeel M did a study in which 76% children had easy approach. ([8,19]

Literacy is an index of awareness and knowledge and plays an important role in detecting the behavior of a person towards health and disease. Educated people are relatively more health conscious than uneducated. So as the literacy status of parents increases, the prevalence of 'at risk' factors decreases. Poor education of mother is an important factor leading to acute accidental poisoning in children. Mothers with low education have no knowledge about storage of poisonous substance and the effects produced. In our study 71% of mothers were either illiterate or less that middle. In a study by Khatejah A, 84.6% of mothers were either illiterate or below middle.[14] Other studies also showed similar results.[19,20] Poisoning was more common in large families. In our study 66.5% had family size 3 or more kids. A study done by Siddique A showed that 72% cases had large family size [17].

A high incidence of morbidity and occasional mortality was observed mostly in low socioeconomic groups. These families live in small houses with overcrowded dwellings. While use of locked cabinets, allocation of high storage spaces out of reach of children are an economic impossibility to these families. They store everything on the floor or in areas easily accessible to children. In our study, 73.5% were of poor socioeconomic status, i-e: they had income per months less than 8250Rs. This is comparable to a study done by Emad uddin, where 71% of acute poisoning cases were from low socioeconomic status.[21] There are other studies, proving that this is an important factor leading to accidental poisoning in children.[15,18]

The containers in which the poisonous substance are stored play an important role in attracting the children because they are usually familiar with them such as cup, can, glass, mineral water bottle and attractive beverage bottles. These containers are left open and are without enclosure. One reason was that people were not cautious enough to buy a separate container and mark it as dangerous due to poor anticipation of risk associate with the poison. They simply utilized the empty beverages bottles, kitchen utensil and empty plastic bottles which are readily available to them lying around the house. This unsafe practice is due to ignorance, illiteracy and poor risk assessment by parents as 77.5% mothers were having no idea about the toxic effects produced by the poison. A study done by Nabeel M showed that 73% of mothers did not had knowledge of the toxic effects produced by the substance which is comparable to our study.[15]

Storage at common places was found in 88% of cases like in kitchen (38.5%), unsderstairs (21%), bedroom (15.5%), bathroom (6.5%) and elsewhere (6.5%). Badar un nisa did a study, showing that poisonous substance was stored in kitchen (50%), understairs (25%), bathroom (16.6%) and bedroom (8.3%).[15]. Ali M did a study showing almost similar results. [1]. In about 91.5% cases mother was involved in some other household work like cooking ,washing, cleansing clothes or furniture when the accidental poisoning occured. Syeda A, in her study showed comparable result.[1] . Since the level of education in this study was lower in the mothers who are primarily caregiver of children at home, they should be educated regarding care and prevention of lethal injuries to their children at home.

CONCLUSION

Males sex, children below 5 years of age, easy access to poison, poor education, low socioeconomic status, mothers distraction due to other household competing works, overcrowding with family size 3 or more siblings, storage at common places (kitchen, bathroom, under stairs, bedroom) and poor parental supervision are identified as leading risk factors for acute accidental ingestion in children.

RECOMMENDATIONS

- It is important to educate parents regarding the safety measures. There should be public awareness programmes about safety of children at home. Information from pamphlets and posters could be

distributed through clinics, vaccinations centers, nurseries and wards.

- Store all products in their original containers. DO NOT use food containers such as milk jugs or soda bottles to store household and chemical products.
- Store food and household and chemical products in separate areas. Mistaken identity could cause a serious poisoning. Many poisonous products look alike and come in containers very similar to drinks or food.
- Return household and chemical products to safe storage immediately after use.
- Keep all dangerous substances in containers which should be tightly closed , out of reach of children and under lock & key.
- Programmes regarding prevention should be an integral part of all well-baby clinics. The counseling for parents and caretakers must include how to poison- proof their child's environment.
- Poison control centers should be established in each district so that proper treatment is readily available at the nearest place.
- Media is very helpful in increasing the level of awareness amongst the parents and effective in reducing the chance of accidental poison intake in children.
- Education of parents and lay community, pediatricians, family doctors and GP's awareness.

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