MEDICAL CHANNEL

Original Article

FACTORS LEADING TO ACUTE ACCIDENTAL POISONING IN CHILDREN

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ABSTRACT

Objective: To determine the factors leading to acute accidental poisoning in children in a tertiary care hospital.

Methodology: This is a cross sectional study conducted at Pediatric Emergency Department, Civil Hospital, Karachi, Pakistan, from October 2010 to April 2011. A total of ninety six children of either gender up to twelve year of age, meeting the inclusion criteria of acute poisoning were enrolled with history of exposure to poisonous substances and reaching the emergency department within twenty four hours. Information was taken from the parents or attendants regarding the name of the poison, time passed since ingestion of poison, factors leading to accidental poisoning like age, improper storage of harmful agents like kerosene oil and bleach in soft drink bottles, easy accessibility of children to medicines used by other members of the family, education of mother, low socio-economic status, residing in urban area and was recorded in the Performa. The data was analyzed using SPSS version 13. Cases of non-accidental poisoning were excluded.

Results: Out of ninety six patients enrolled in the study, mean age was 3.13 ± 1 years and mean time of exposure was 1.2 ± 1.1 hours. Most common toxicagent accidently taken by children was bleach (33%) followed by kerosene oil (21.9%) and organophosphorus compounds (11.5%). Regarding clinical presentations, difficulty in breathing was present in 57.29% cases followed by drooling of saliva14.5 and pinpoint pupil in 12.5% cases respectively.

Conclusion: It is concluded from the study that accidental poisoning is more frequent in children less than three year of age, common factors leading to accidental poisoning in children were easy accessibility, residence in urban area, low socio-economic status, lack of education in mothers and harmful substances stored in soft drink bottles and other attractive containers.

Key Words: Poisoning, accidental, children, factors

Acute accidental poisoning is highly common in children. It is an exposure of an individual to a substance that can cause symptoms and signs of organ dysfunction leading to injury or death and is one of the major causesof morbidity and mortality in pediatric age group.[1, 2] The incidence of acute poisoning in children is reported to be 0.33% to 7.6%.[3] There are certain factors that predispose to accidental poisoning in children like age socio-economic status, residence in urban or rural areas, education of mother, improper storage of harmful house hold products including kerosene oil, bleach and easy accessibility of medicines to children.[4-5]

Accidental exposure to house hold poisons is frequently found in younger age group probably due to inquisitiveness to explore things. A study conducted at tertiary care hospital showed that poisoning was most common among two to five year of age (54%).[4]Another recent data reported that medicines used by the parents are most frequent products for accidental poisoning in children less than one year of age whereas house hold cleaning chemicals are common source of poisoning in older children.[6] Gender difference for accidental poisoning is also reported in various studies, it is more frequently observed in males as compared to girls.[7, 8] Other pertinent factors leading to house hold poisoning include socioeconomic and education status of mothers or caretakers in the family. Poisoning was found to be more common in the lower socio-economic group (71%) and improper storage of kerosene oil lead to accidental poisoning in (61%) of cases.[4]In an Indian study it was found that accidental poisoning was higher in boys (63.4%) than girls (56.7%) and was more frequently observed in urban slums as compared to middle income group. Similarly education of mothers also influenced the rate of acute poisoning as 89% of mothers were illitrate.[5] Easy accessibility to house hold products was also found to be an important factor leading to accidental poisoning in most of the studies.[9]

Frequently reported agents for house hold poisoning are pharmaceutical products responsible for majority of cases followed by petroleum products, chemicals, household substances and unidentified poisons .[10]These substances are stored in soft drink bottles, side drawers of tables and colorful boxes which attract children and also due to easy accessibility leads to increased risk of accidental poisoning. Morbidity and mortality due to accidental poisoning is quite high in children, one of the local studies showed that 80% patients were discharged with morbidity of 6% and mortality of 11%. [9] Issue of accidental poisoning in children is very grave and although studies has been done to highlight the problem but there is still need of further research to determine the causes and safety measures for accidental poisoning so that appropriate management plan can be developed regarding treatment and prevention of these unfortunate events. This study was conducted to determine the factors leading to acute accidental poisoning in children in a tertiary care hospital.

METHODOLOGY

This is a cross sectional study, conducted at Pediatric Emergency Department of Dow university of health sciences and Civil Hospital Karachi from October 2010 to April 2011 .This is a public sector teaching institute and hospital which provides health care facilities to a large population of urban and rural Sindh province in Pakistan. A total of ninety six children of either gender less than twelve year of age reaching the pediatric emergency department within twenty four hours of accidental exposure to poisonous substance were included in the study by non-probability consecutive sampling technique whereas all cases of non-accidental poisoning like suicide, iatrogenic drug over dosage, acute food poisoning, history of snake bite, scorpion or insect sting, dog bite, rat bite and vague history of poisoning were excluded from the study. Upon reaching the emergency department children meeting the inclusion criteria for acute poisoning were included in the study and an informed consent was taken from parents or attendants, questions were asked from parents or attendants regarding the name of the poison, amount taken, time passed since exposure to poison, factors leading to accidental poisoning like age, improper storage of kerosene oil and bleach in soft drink bottles, easy accessibility of children to medicines used by other members of the family, education of mother or caretaker, socioeconomic status and residence in urban or rural area.Followup was done after the emergency management till discharge or expiry of patients. This information was collected by principal researcher or doctor on duty and recorded in a predesigned Performa. Data was analyzed using SPSS version 13. Mean and standard deviation was calculated for quantitative variables, like age, time passed since exposure to poison. Frequency and percentages were calculated for qualitative data including factorsleading to accidental poisoning like age, improper storage of kerosene oil and bleach in soft drink bottles, easy accessibility of children to medicines used by other members of the family, education of mother, socioeconomic status and residence in urban or rural area.

RESULTS

A total of ninety six patients were enrolled in this study. Mean age of enrolled participants was 3.13±1 year. Out of ninety six children, 58 (60.42%) were of less than three year of age. Mean time of exposure to a toxic agent was 1.2±1.1 hours. Among patients who came to emergency department within 24 hours of exposure to poisoning, 67 (69.79%) took more than 1 hour to reach after exposure and 29 (30.21%) took less than 1 hour to reach after intake of poisonous substance.

Most common agents accidently taken by children was bleach,

FIGURE – I

Type of Poisoning in enrolled patients (In percentage %)

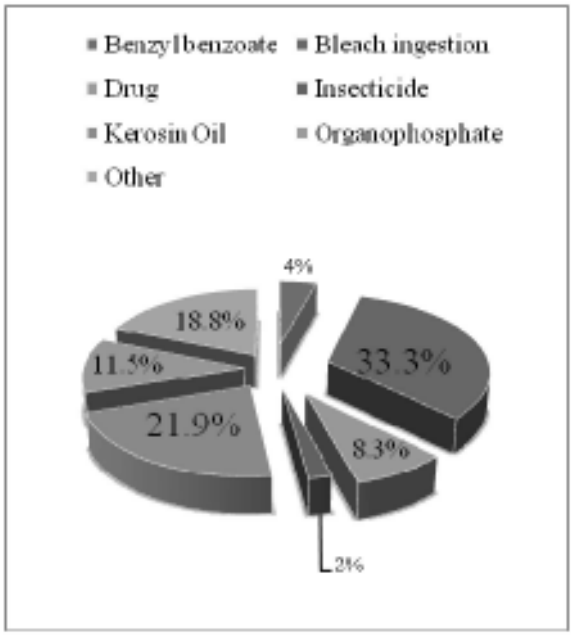
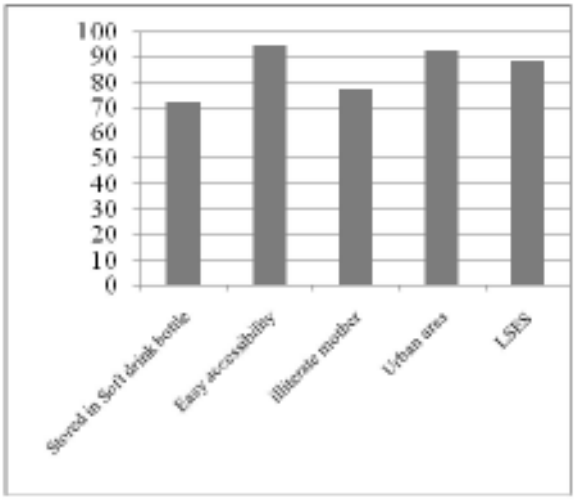


FIGURE – II

Frequency of Factors leading to Accidental poisoning n=96



32 (33.3%) followed by kerosene oil, 21 (21.9%), organophosphorus poisoning was found in 11 (11.5%), drug ingestion was 08 (8.3%) followed by benzyl benzoate, 04 (4.16%) and insecticides like chlorinated hydrocarbons and household cleaner agents were 02 (2.08%), in 18 (18.8%) the poisonous substance couldn't be identified in emergency department. (Figure 1)

Regarding clinical presentations, 88 (91.66%) were conscious at the time of arrival in emergency department. Most common complaints were difficulty in breathing in 55 (57.29%) cases followed by drooling of saliva in 14 (14.58%) and 12 (12.5%) had pinpoint pupil whereas only 08 (8.33%) were received in unconscious state. Common potential factors for accidental poisoning were easy accessibility, 94 (97.91%), followed by residence in urban area, 92 (95.83%), low socio economic status, 88 (91.66%) lack of primary education in mothers was found in 77 (80.20%) and poisonous substances stored in attractive containers like soft drink bottles in 72 (75%). (Figure2).

DISCUSSION

Accidental poisoning is one of the major causes of emergency admissions in children worldwide.

In this study possible factors leading to accidental poisoning in children were assessed which can be avoided with appropriate preventive measures.

In most of the studies it has been observed that majority of accidental poisoning occurs at home, therefore widespread analysis of household environment is needed to control the problem.[11] In various studies children under five year of age was the major risk group for unintentional poisoning, on account of their inquisitiveness in exploring the surroundings and the regular hand-mouth contact withthe peak age between two to three year.[12, 13]In our study 58% of children affected were under three year.One of the significant observations in this study was interval between exposure and arrival in emergency, most of the patients were brought after one hour of exposure, (69.79%), similar findings were reported in another study.[14] Delay in reaching hospital could be due to uncertainty of exposure to poisoning, vague symptoms, lack of knowledge of parents, trial of home remedies and non-availability of appropriate health facilities in the vicinity.

Common clinical presentations of poisoning as shown in various studies are respiratory distress, unconsciousness, drooling of saliva and vomiting,[15, 16] in this study difficulty in breathing was the most frequently observed clinical feature.

Substances responsible for childhood poisoning in our study were house hold cleaning agents including bleach, kerosene oil, drugs and insecticides, out of which bleach was responsible for 33.3% cases followed by kerosene oil in 21.9% cases.high incidence of poisoning with these products is probably because of their frequent usage in houses, storage in attractive containers like soft drink bottles and easily approachable to children. Studies done earlier also reported kerosene oil to be the most common toxic agent for house hold poisoning.[17, 18]

Many factors are responsible for house hold poisoning

including easy accessibility, unsafe storage of harmful substances, education status of mothers, residence in urban or rural area and socioeconomic status of families.

In this study unsafe storage of chemicals, kerosene oil and bleach in soft drink bottles accounted for 75% cases. Similarly another study showed unsafe storage of household chemicals and medicines were more among cases than control.[19] Color and flavor of medicines are thought to increase the risk of poisoning, because they can be mistaken for candy or harmless substances. Similarly bleaches, disinfectants and softeners are often sold illegally in beverage containers whereas home safety education and provision of safe containers can ensure harmless storage of medicines and cleaning products.[20]

Easy accessibility is another amendable risk factor. This was also identified in earlier studies.[18-20] It is observed that hyperactivity in young age groups makes them prone for exposure to harmful substances, in this study, almost 98% of accidental poisoning was due to easy accessibility.

Another significant factor leading to poisoning is residence in urban or rural area, in an earlier study children belonging to urban areas were more exposed, (83.5%) compared to those in rural areas,[21] in our study majority of children also belong to urban area, (95.83%). Education status of mother also play a significant role in occurrence of poisoning in children ,Most of the studies reported that in majority of cases mothers were uneducated,[22,23] in our study also mothers were uneducated in 80.2% cases, leading to high morbidity and mortality in these children, Low socio-economic status was another factor behind house hold poisoning as 91.6% children in our study belong to low socioeconomic background, this is also consistent with studies from developing as well as developed countries.[24,25]This socio-economic variability is not only associated with exposure to poisonous substances but is also related to several other factors such as improper storage, knowledge of parents and type of fuel and other products consumed in homes as the use of kerosene oil, bleach is common in low socioeconomic group**.**The information given in this study is highly relevant for public health as it suggests that it is possible, to prevent a substantial percentage of accidental childhood poisoning cases by controlling certain household environmental factors identified earlier, Nevertheless there are few limitations of this study, since the duration of the study was only six months so results cannot be generalized, we need to have a larger study period and community based studies to recommend a strategy for prevention of theses unfortunate events.

CONCLUSION

It is concluded from the study that accidental poisoning is more frequent in children less than three year of age, common factors leading to accidental poisoning in children were easy accessibility, residence in urban area, low socio-economic status, lack of education in mothers and harmful substances stored in soft drink bottles and other attractive containers. House hold cleaning agent, bleach was the most frequently found toxic agent, followed by kerosene oil poisoning. It is recommended that proper management and preventive health programs should be implemented in all primary and tertiary health facilities including establishment of poisons information centers to control accidental poisoning in children and further these unfortunate events can also be prevented by counselling of parents on the issue in well baby clinics, outpatients departments or by conducting health education programs through media.

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CONFLICT OF INTEREST

Authors declare no conflict of interest.

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****Reviewing Of Data, Literature Reviewand Collection Of References.
*****Collection Of References And Litrature Review