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Accidental Ingestions in Childhood

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ABSTRACT

One-hundred and twelve cases of accidental poisoning were admitted over a 2-year study period (December 1990 to December 1992). Data was collected upon admission and patients were subsequently followed-up. Fifty-four percent of admission were boys. Majority of them were toddlers between the ages of 1 and 3 years. Thirty percent of accidental ingestions occurred during the school/public holidays. These occurred when the caretakers were preoccupied. Forty-nine percent of patients ingested oral medication; 16% ingested household liquids and the rest ingested other household products like cockroach tablets and thermometer mercury. The most commonly ingested medications were paracetamol, salicylate and bronchodilators, whilst chlorox, kerosene and detergents were the common household liquids ingested. The ability of the caregivers to quantitate the ingested product was poor. The mean hospital stay of the patients was 2.5 days. The majority of them were admitted for observation which did not require antidotes. Four cases were observed in the intensive care unit. There were no fatalities during the study period. Forty-four percent of the patients had samples taken for toxicology analysis, of which, less than half had positive results. All the patients were advised on the safety measures to look out for after admission. Less than 10% of cases had prior knowledge of such measures before the accidents occurred.

Keywords: accidental poisoning, children

INTRODUCTION

Accidental poisoning in childhood is not an uncommon hospital admission. It is a preventable emergency which causes much distress to the parents and caretakers. The incidence varies from 0.33% to 7.6%. There is no recent report on local incidence of accidental poisoning. Our study looks into the circumstances where poisoning occurs, the association between accidental poisoning and parental educational level, the outcome and preventive measures that can be taken.

METHOD

A prospective study of accidental ingestions in children admitted to the Paediatric Ward in Tan Tock Seng Hospital was done over a 2-year period (December 1990 to December 1992). During this period, there were 15,133 admissions, of which, 112 were for accidental poisoning.

Information was obtained by interviewing the parents and/or caretakers according to a standard questionnaire upon admission and throughout the hospital stay. The identification of the ingested substance was based on the case history and the relevant substances sent for toxicological analysis.

RESULTS

There were 112 admissions, of which, 54% were male. Majority of the admissions was Chinese (64%), Malays constituted 18%, Indians 14% and Others 5%. This is consistent with the general ethnic population distribution, with the exception of Indians, for whom the proportion of admission was slightly higher than in the general population. Sixty percent of the admissions were toddlers aged between 1and 3 years (Fig 1).

Timing of ingestion

Thirty percent of the cases occurred during public and school holidays (Fig 2). Majority of the cases occurred during the day and took a median of 2 hours (mean 4.8 hrs) from the time of ingestion to admission (Fig 3).

Type of ingestion

Medication was the most common form of accidental ingestion (49%) and household liquids constituted 16%. The most commonly ingested medications were paracetamol, salicylates, bronchodilators and sedatives (Fig 4).

Chlorox, kerosene and floor detergents were the most common household liquids ingested. Other substances ingested included contraceptive pills, thermometer mercury, mothballs and cockroach pills.

There was a good correlation between expected substances and toxicology results in the lavage and blood studies. Forty-four percent of the study population had toxicology studies done, of which, less than half had positive identification of the substance on analysis of the specimen, stomach washout or blood samples (Fig 5). Most parents were unable to quantify the amount of substance ingested.

Hospitalisation

The mean hospital stay was 2.4 days. The majority of patients were admitted for close observation. All

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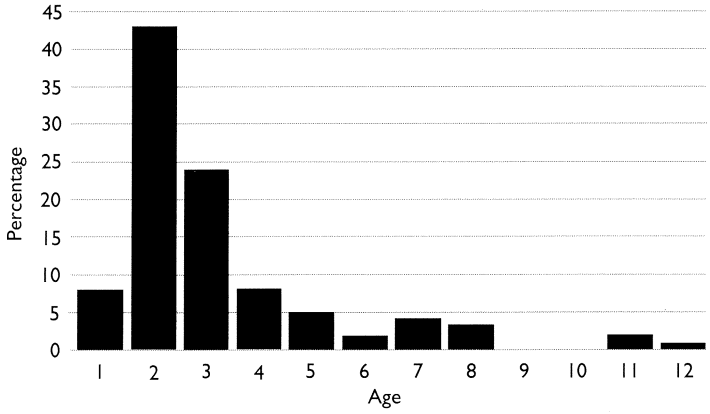

Fig 1 - Age of presentation

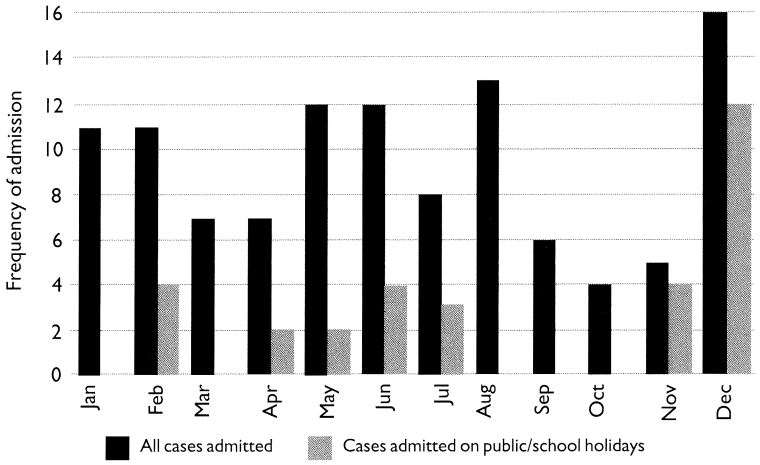

Fig 2 - Monthly distribution of admission

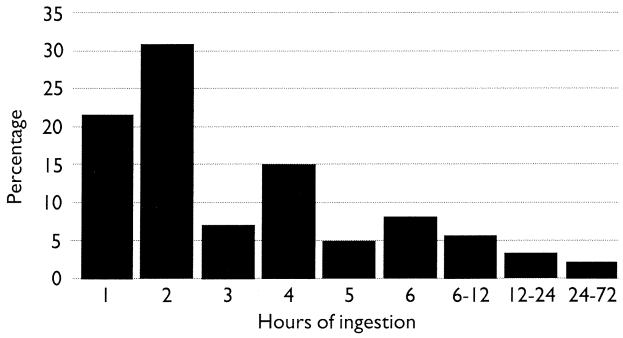

Fig 3 - Time taken to admission

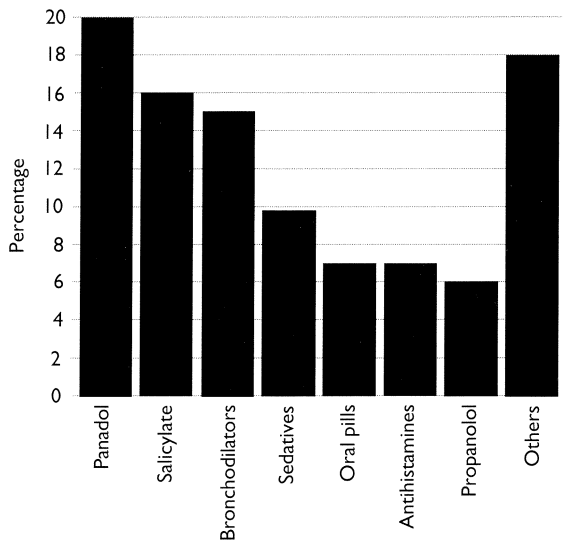

Fig 4 - Medications ingested

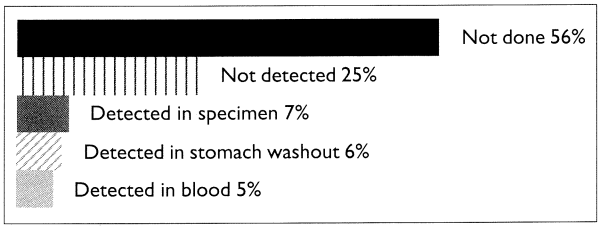

Fig 5 - Toxicology of specimens

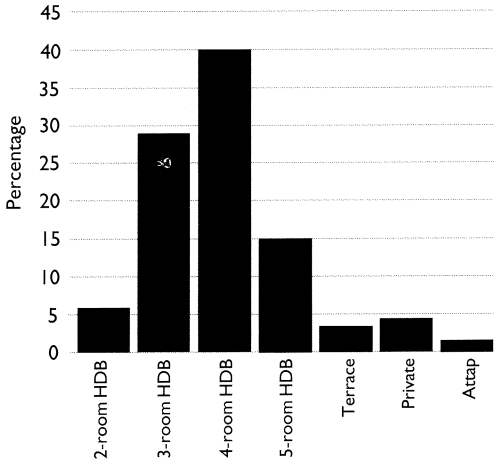

Fig 6 - Housing of admitted children

patients recovered without any antidote given. Four patients were monitored in the intensive care unit for about 1 day's duration each. One patient consumed an excessive amount of carbamazepine while another mistook her father's phenobarbitone as her own medication. The third child consumed an excessive amount of dormicum and the fourth took propanolol. All 4 patients were monitored closely in the ICU, owing to the potential for serious consequences. They were subsequently discharged well.

Social background

The majority of the patients were from families with a total income of less than $2,000 per month. Forty-one percent lived in 4-room Housing and Development Board (HDB) apartments (Fig 6). Parental educational level was consistent with that in the general population distribution.

Most of the parents of these children had either primary or secondary education. The child's mother was the main caregiver in 80% of cases. Parental educational level did not affect the time taken to bring the child to hospital (Fig 7). The majority of the parents' age was between 30 and 35 years. Most had 1 to 2 children in the home at the time of accidental ingestion.

Twenty-three percent of accidental ingestion occurred when the main caregiver was preoccupied with housework and 15% occurred while the caregiver was cooking. Eleven percent of thc caregivers were sleeping, 9% were having their meals, 8% at laundry, 8% were in the toilet, 6% on the telephone or kitchen and 5% were watching television. The rest were doing other things.

Most of the medication was kept in unlocked cupboards, others were placed on tables, refrigerators or carelessly in bags either before or after consumption.

DISCUSSION

Accidental ingestion of drugs and chemicals is a common cause of paediatrics hospital admission. Such admissions formed 0.8% of the overall hospital admissions during the study period. Our study did not show any male prepondence as suggested by other studies[1-4]. However, 60% of the children were toddlers between the ages of 1 and 3 years, which was consistent with other studies[1,3,4]. Despite such a frequency, this problem had not been adequately addressed previously in the local context. There were no recent local studies done to look into this problem.

The majority of incidents occurred during the day, public and school holidays (Fig 2), and when the caregivers were preoccupied with their own work. This indicates that extra care must be taken with a child at home. No household was spared regardless of income level, parental educational status and social group. The most common reasons cited were ignorance and carelessness, revealing a general lack of parental knowledge on home-safety for children. There was no correlation between educational level and child-rearing knowledge.

Most instances of accidental poisoning involved commonly prescribed drugs and households products. These were generally placed in unsecured areas such as unlocked cupboards, table tops, bags and shelves which were easily accessible to curious, exploring and unsupervised toddlers. The child-minder has to be vigilant and careful with the storage of drugs. During such as these are best kept in locked and secured supboards not within the reach of children. It is best to avoid storing medication or hazardous solutions in beverage bottles for fear of accidental ingestion and it is also advisable to check the label of the medication first before serving it to a child. It is also imperative that children be educated on the consequences and seriousness of playing with medication and household chemicals.

In addition to storage, packaging can also help to reduce the incidence of accidental ingestion. Pharmaceutical companies can help by producing drugs packed in child-proof containers, opaque blister packs and strips. Dramatic reductions in incidence of children admitted for (in particular) salicylate poisoning have been reported when child-resistant containers were introduced for aspirin and paracetamol[5-7]. Opaque blister packs, strips packs and sachets have also been associated with less poisoning episodes compared with those in transparent blister packages[5].

The median time for hospital admission in the study group was 2 hours. This duration of delay prior to admission was not associated with any adverse outcome. It could possibly be due to the small amount or innocuous compounds ingested. We did not look into the reasons for this delay. This could be owing to

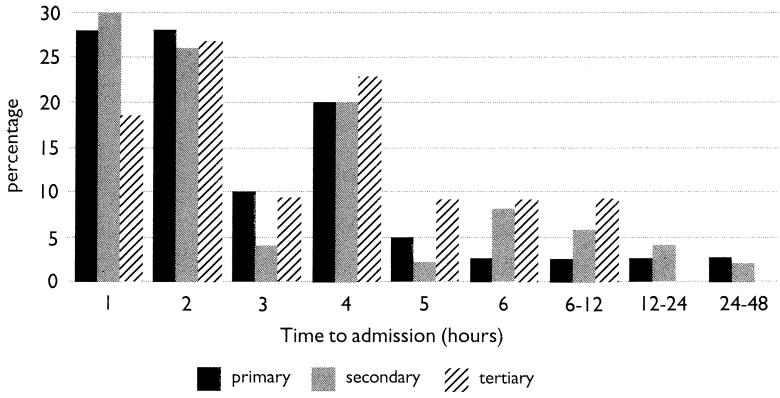

Fig 7 - Mother's educational level and the time taken to admission

fear of being reprimanded or parental ignorance. Estimation of the amount of agent ingested was also not highly accurate. A fair amount was often noted to be spilled in the event of ingestion.

Often, the caregivers did not witness the child consume the agents. Ingestion episodes were noted because the children were seen with the agents around their mouths and on their faces or when there was a lot of spillage in the surrounding areas. In many such instances, the caregiver assumed that the child took the agent orally. Occasionally, the ingestion was witnessed by other children in the vicinity. These made quantification of the amount of ingested agent difficult. As such, there was often a tendency in over estimating by the attending physician, of the quantity consumed.

Physical induction of vomiting was done by some of the caregivers attempting to reduce the amount of agents ingested. Emetic agents and absorbents such as activated charcoal were not used in any of the cases during the study period. These agents were either not available at the time of ingestion or did not occur to the caretaker during times of panic. Many parents also do not regularly keep emetic agents at home in anticipation of such problems, although these agents, when appropriately used, may help to reduce the toxicity of ingested medications and household chemicals. Stomach washout was done in 44% of cases to reduce the amount of substances ingested. It was fortunate that there was no mortality and none of the cases required any specific antidote during the study period[4,8].

Most of the ingested agents were known by the caregivers and identified by the container with the remaining agent. Toxicological analysis (with stomach washout) was done in 44% of the cases. In the other 56%, stomach washout was not done because it was not a useful means of identifying the ingested agent (as in candle wax ingestion or ingestion of leaves). More than half of toxicological analysis revealed negative results. Toxicological analysis is still an important investigation in instances when the child ingests unknown compounds or other suspected poisons beside those known to the caregivers. It can assist in the management of the child[9].

Despite following poisoning protocols[9], variations are necessary in the management of children who have ingested different types of poisons. Standardisation is therefore not possible as wide variations are often encountered in patients' previous medical history.

CONCLUSION

Accidental poisoning is a common preventable condition affecting predominantly toddlers between 1 and 3 years of age. It accounted for 0.8% of all hospital admissions during the 2-year study period. The absence of fatalities in this study should not lead to a false sense of security and complacency in managing this problem. There was an apparent general lack of knowledge on home-safety in all the cases studied. A higher parental educational level did not correlate with a reduced incidence in the study.

There is a need to create public awareness on child rearing and home-safety and such programmes should be regular. Information from pamphlets and posters could be distributed through clinics, polyclinics, nurseries and child care centres. Courses and talks on related topics by trained personnel or health workers could be conducted to further disseminate knowledge. To assess the success of the educational programmes, future studies should also be conducted.

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