



Patterns of Accidental Poisoning in Children in Puducherry, India

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ABSTRACT

Context: Accidental poisoning has been a poorly researched area in the Sothern Indian setting.

Aims: To study the patterns of accidental poisoning in Puducherry and to compare the results with previous Indian studies. Settings and Design: A retrospective chart review conducted at Sri Manakula Vinayagar Medical College and Hospital, Kalitheerthalkuppam, Pondicherry

Methods and Material: A retrospective chart review of the emergency department registers and the case files of all accidental poisoning cases of all children < 12 years of age, from January 2014 to December 2014 were utilised. Sociodemographic and clinical details about the proposed accidental event was collected into a self-designed semi-structured proforma. Statistical analysis used: SPSS version 13 was used for descriptive analysis.

Results: 21 cases of accidental poisoning were identified of which the most common was kerosene ingestion in 12 cases (57.14%), unknown substance poisoning in 3 (14.28%), abrus precatorius poisoning in 2(9.52%), tablet diazepam in 1 (4.76%), syrup cephalixin in 1 (4.76%), accidental hanging in 1 (4.76%), Abrus precatorius seeds poisoning by children (one 2 years & one 3 years). Overall prevalence was 2 per 100,000 population and the findings were similar to previous reports.

Conclusions: Accidental poisoning is children needs more detailed evaluation in a multicentered fashion to identify the exact number and primary prevention from a multidisciplinary participation along with public awareness is needed to prevent it.

KEYWORDS

Accidental, poisoning, organophosphorus, insecticide, hanging, substance.

Introduction:

Accidental poisoning in childhood is a worldwide problem, and over the last two decades, it has been reported as a public health problem in the United Kingdom¹, Europe², the United States of America³, India⁴ and Australasia⁵.

Accidental poisoning in children is one of the commonest emergencies encountered in paediatric practice. The reported incidence of childhood poisoning in various studies varies from 0.3 to 7.6 %, which constitutes a significant number of admissions to the paediatric wards. Accidental poisoning is an important cause of death in early childhood. Hydrocarbon ingestions, mainly kerosene, account for about 5% of all accidental poisonings and 25% of all fatal ingestions in children of <5 years of age⁶.

In India, accidental kerosene oil poisoning has been reported as a serious public health problem, but there has been paucity of more recent published data and of information on whether it could still be an ongoing agenda of concern. Almost all of the evidence reported till date, have shown that patterns of child poisoning are changing rapidly. It is important to document current trends, as poisoning has hitherto been a notable cause of mortality in toddlers. So far, different regional studies across the world are not available to exhibit the incidence and patterns of different poisoning.

Our goal was to re-address this health problem in children in India and we decided that the town of Puducherry, in South India, that has for the third consecutive year recorded the highest national average of suicide rate of 40.4 per 100000 population⁷, might also rate high in accidental poisoning. We felt that it would be relevant to compare our study results with other similar Indian studies in order to identify possible social, demographic and clinical correlates of accidental poisoning which tends to be usually different across various cultural backgrounds in the world.

On this background, the present study was designed with the main aims of finding out the patterns of accidental poisoning in Puducherry and to compare the results with similar studies pertinent to Indian setting.

Subjects and Methods:

The study was conducted over 3 months between April to June 2014, in the Department of Psychiatry, Sri Manakula Vinayagar Medical College and Hospital, Kalitheerthalkuppam, Pondicherry, a tertiary care hospital located in Puducherry, India. The ethical committee of the hospital had approved the study prior to data collection and the medical records department provided the case registers of one year, of all those who had accidental poisoning and had attended the emergency services for medical treatment.

To identify the cases we needed, the following definitions were used. "Poisoning" was defined as the potential of a chemical substance in acting adversely or deleteriously on the body⁸. All cases of poisoning that result from accidental use of drugs and chemical substances, or the use of drugs by children due to curiosity, are known as "accidental or non-intentional poisoning".

A retrospective review was done of the emergency registers and the case records of the patients who had met the inclusion criteria of children <12 years of age and had presented with a diagnosis of "accidental poisoning".

Results:

Out of 4200 cases seen in the emergency services, 21 cases of accidental poisoning were identified for the one year period (table1). The age range was from 1 year to 12 years (mean 3.28; SD 3.21). The male-female sex ratio was 10 males: 13 females. The majority of the cases 18 out of 21 belonged to a lower socio-economic family and 3 from a middle socio-economic family background. Alcohol dependence syndrome was seen in the fathers of 5 out of 23 cases of patients. Stressors in the form of financial debts were found in 2 cases.

The most common form of accidental poisoning was kerosene ingestion in 12 cases (57.14%), unknown substance poisoning in 3 (14.28%), abrus precatorius poisoning in 2(9.52%), tablet diazepam in 1 (4.76%), syrup cephalixin in 1 (4.76%) and accidental hanging in 1 (4.76%). Surprisingly there were 2 cases of Abrus precatorius seeds poisoning by children (one 2 years & one 3 years), 1 case of insect poison in liquid form, all of which has never been reported in scientific literature yet.

Unknown tablet poisoning in 3 cases, 1 case of diazepam tablet ingestion and 1 case of syrup Cephalixin ingestion were notable among medications related poisoning. Only 1 case of accidental hanging by an 11 year old male child was seen. Family history of completed suicidal death was recorded in 1 case of insecticide solution poisoning.

Discussion:

We have tried to analyse the study findings from various perspectives, primarily to understand the status of accidental poisoning from a public health viewpoint in India where suicidal or intentional poisoning is considered more serious and secondly to highlight the importance of formulating guidelines and methods for safer storage of potential poisonous substances which are sometimes used for intentional self-poisoning by adolescents and adults and sometimes by children as in accidental poisoning.

Looking from a social and demographic profile viewpoint, majority of the cases belonged to lower socio-economic family background that can self-explain its other common associations such as lower educational status, low income, and poor housing conditions, relatively less health and safety standards. The age distribution in our sample matched with reports from other studies including the sex ratio of more female cases than males. Those children > 5years were not attending school but staying at home.

On a clinical perspective, "poison" is defined as a substance that is 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 (limited to the eyes, skin, lungs, etc.). The prevalence of accidental poisoning in our study was 2.0, which is comparable to previous similar reported Indian studies on accidental poisoning (table II).

Kerosene poisoning

Our study findings are not very different from previous reports⁸, in that kerosene ingestion was usually the commonest method of accidental poisoning in developing countries where kerosene is used for the purpose for cooking by families of the lower socio-economic communities. Due to poor housing conditions and safety measures adopted in such homes for storage of kerosene, there could be easier access for children, to come in contact with kerosene, because of their inherent curiosity and indulgence in unsupervised play inside their homes. Henceforth, it is imperative to improve the safety standards of storing kerosene and also raising the awareness of parents of children, about accidental poisoning hazards. Even though kerosene is not particularly poisonous in itself, the effects of ingestion in children and in large doses, of either acute or chronic time period is likely to have detrimental effects.

Other methods of poisoning

Accidental ingestion of diazepam tablets by 1 child who was 2 years old occurred in a household where the grandmother in the home was utilising these medications for lack of sleep. Similarly another 4 year old female child had accidentally consumed syrup cephalixin while at home. These 2 cases highlights the changing pattern of accidental poisoning and how important it is to report such changes so that relevant preventive strategies can be formulated.

In 2 cases, abrus precatorius poisoning was noted. Poisoning with abrin, the main toxic principle in *Abrus precatorius* (Jequirity; Rosary pea), a plant that grows wild in most parts

of India has been rarely reported in Indian medical literature, even though cases do get reported periodically from around the world. Most cases of poisoning involve the ingestion (inadvertently or deliberately) of these attractive red seeds. The main active principle in *Abrus precatorius* is abrin which is a toxalbumen very similar to ricin found in Castor seed. Chewing or crushing of the seed before swallowing will enable the toxins to be released.

Accidental Hanging: An eleven-year-old boy was quite surprising, although strictly might not be considered medically appropriate as being "accidental" due to the term 'hanging'. If were to be truly accidental as documented in our records, demonstrates the risk to which children in Indian setting are exposed to in their homes. Since more details about this incident in this case were not available in the case record, further analysis into the presence of intention prior to the incident was not possible. In 3 other cases, the nature of the substance deemed to be poisonous was not recorded.

In terms of studying the possible correlates for accidental poisoning, our study identified lower socio-economic background of these children as finding that was found in previous reports also. Strangely, no cases of accidental ingestion of organophosphorus compounds which has widely reported was observed in our sample. Moreover, the low number of 21 cases in one year might be understood in the background of many options of immediate care being available to the people in the catchment area of our tertiary hospital setting, and majority of people getting first aid at local health centres or using traditional methods of removing the poison. In addition, in 5 cases out of 21, there was a family history of alcohol dependence syndrome, which reflects the possible poor health concern in such families towards the safety of young children.

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