Changing Trends of Accidental Poisoning in Children over the Last Two Decades

Sir,

Poisoning is one of the common pediatric emergencies in India. The nature and pattern of poisoning vary with region, socioeconomic and cultural factors, and living conditions.[1] Knowledge about the trends of this important public health problem is essential to plan preventive interventions.

The present study was carried out to analyze the changing trends in poisoning in children over a period of two decades from 1999 to 2019. The study setting was the Department of Pediatrics, Government Medical College, Kozhikode, which is a tertiary care referral hospital in Kerala. Retrospective analysis of hospital records of children admitted with poisoning during the 5-year periods from 1999 to 2003 and from 2015 to 2019 was done. The age, gender, type of poisoning, and outcome were compared. Cases of food poisoning, inadvertent therapeutic mistakes, bites, and stings were not included. Approval from the institutional ethics committee was obtained.

During both periods, poisoning occurred more commonly in boys, and majority of cases were in children below the age of 3 years. In 98% of cases, poisoning was accidental and occurred at home during both periods. Intentional poisoning occurred only in children above 9 years [Table 1].

Kerosene poisoning decreased from 46.59% during 1999–2003 to 6.6% during 2015–2019. Prescription drugs contributed to 59% of poisoning cases during the period from 2015 to 2019 [Table 2]. The drugs involved in poisoning included antipsychotics, anticonvulsants, iron, paracetamol, and benzodiazepines during both periods. The common antipsychotics implicated in the initial period were haloperidol, chlorpromazine, and clozapine, whereas in the latter period, risperidone, olanzapine, and quetiapine were also involved. Poisoning due to thyroxine and clonidine occurred only during the period 2015–2019. There was no statistically significant relationship between age and gender and type of poisoning.

Mortality was 0.2% during 1999–2003 and 0.66% during 205–2019. Deaths occurred after poisoning with organophosphorus pesticide, caustic soda, seeds of *Abrus precatorius*, and zinc phosphide.

The age, gender, and type of poisoning were comparable to the findings of previous studies with no significant changes over the years.[1,2] Kerosene was the most common poisoning agent during the initial 5 years but has significantly decreased during the latter 5-year period. This may be a reflection of the reduction in the use of kerosene as cooking and lighting fuel in Kerala. There is wide regional variation in the incidence of kerosene poisoning, with some studies reporting a declining trend[2] and others reporting continued occurrence.[3]

Over the years, prescription drugs have become most commonly involved in poisoning, contributing to nearly 60% of all poisoning cases during the latter 5-year period. Other studies have reported comparable findings.[4] The pattern of drugs involved in poisoning did not change significantly over the years, except for the increased number of cases due to ingestion of clonidine, thyroxine, and second-generation antipsychotics. The increase in poisoning due to second-generation antipsychotics such as risperidone and

Table 1: Age, gender, and nature of poisoning in children during 1999-2003 and 2015-2019

	1999-2003 (*n*=1307), *n* (%)	2015-2019 (*n*=303), *n* (%)
Age (years)		
0-3	949 (72.6)	187 (61.7)
3-6	275 (21)	64 (21.1)
6-10	54 (4)	33 (10.9)
10-12	29 (2.2)	19 (6.3)
Gender		
Male	820 (62.7)	181 (59.7)
Female	487 (37.3)	122 (40.3)
Nature of poisoning		
Accidental	1244 (98.2)	296 (97.7)
Intentional	12 (0.9)	2 (0.7)
Homicidal	10 (0.8)	5 (1.7)

Table 2: Substances involved in poisoning in children during 1999-2003 and 2015-2019

Substance	1999-2003 (*n*=1303), *n* (%)	2015-2019 (*n*=303), *n* (%)
Kerosene*	609 (46.6)	20 (6.6)
Drugs*	226 (17.3)	179 (59.1)
Seeds and plants	64 (4.9)	4 (1.3)
Rat poison	47 (3.6)	33 (10.9)
Detergents/corrosives	41 (3.1)	12 (4)
Mosquito repellent	15 (1.1)	7 (2.3)
Insecticides	36 (2.8)	10 (3.3)
Indigenous medicines	44 (3.4)	2 (0.7)
Vinegar	28 (2.1)	2 (0.7)
Organophosphorus pesticides	34 (2.6)	11 (3.6)
Unknown	56 (4.3)	9 (3)
Others**	107 (8.1)	14 (4.6)

*Statistically significant difference, **Others include copper sulfate, potassium permanganate, tobacco and cigarettes, petrol and diesel, naphthalene, coal, tar, cyanide, pencils, caustic soda, mercury, alcohol, varnish, shoe polish, and formalin

olanzapine may be a reflection of the changes in the prescription pattern of antipsychotic drugs, with more second-generation antipsychotics being prescribed[5] and increased use of clonidine for behavior disorders in children. The occurrence of poisoning with thyroxine tablets may be an indication of increasing prevalence or increased rates of detection of hypothyroidism.[6]

Young children are usually inquisitive with a tendency for oral exploration. They are likely to imitate adults by ingesting drugs in their absence. Hence, drugs should be kept out of reach of children, and parents should refrain from taking or dispensing drugs in their presence. Child-resistant packaging of pharmaceuticals and secure storage of noxious substances at home are the cornerstones for preventing accidental poisoning in children, while appropriate legislation and public awareness are also important. One limitation of this study is that we could not assess the association between socioeconomic status and the type of poisoning since the data were derived from the available hospital records.

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Conflicts of interest

There are no conflicts of interest.

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