

Original article

Study of pattern of poisons in various age groups in acute poisoning cases

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Abstract:

Introduction: Now days accidental and suicidal poisoning is a significant contributor to mortality and morbidity throughout the world and is increasing in India in all age group. So it is imperative to find out type of poisoning in particular age groups, as it will immensely help the health policy makers to reduce the mortality and morbidity due to poisoning. So the present study is carried out to study pattern of poisons in various age groups in acute poisoning cases.

Methods: This hospital based prospective cross sectional study was carried out over a period of two years after approval by Institutional Ethics and Research committee at Rural Medical College, Loni and Pravara Rural Hospital, of Pravara Institute of Medical Sciences, Loni. All admitted and brought dead cases of acute poisoning, cases of known and unknown bites and stings from all age were included in the study. Comprehensive proforma for the study was designed which contained age of the patient of acute poisoning and type of poisoning. Information about the relevant facts pertaining to the type of poisoning was gathered by directly interviewing the patient (wherever possible) or the relatives, friends or those accompanying the patient after obtaining the written, informed consent and also from the investigating police authority. Relevant data of the individual poisoning cases was collected from medico-legal cases register of casualty, case papers from concerned department, inquest, post-mortem reports, chemical analysis report after taking informed consent from patient or relatives. Data was statistically analyzed using statistical software SPSS Statistic 17 and Microsoft Office Excel 2003. Data was analyzed in the form of percentage (%) and proportion.

Observations & Results: During the study period total 557 cases of acute poisoning were reported. Organophosphorus and Organochlorine compounds were most common type of poisons in the age group of 21-30 years. Pyrethroid compounds were most commonly encountered in the age group 11-20 years. Kerosene was encountered only in the age group of 0-10 years. Maximum number of snake bite cases were in the age group of 21-30 years where as scorpion bite (sting) was most commonly encountered in the age group of 0-10 years. Ethyl alcohol was most commonly encountered in the age group of 21-30 years.

Conclusion: Organophosphorus, organochlorine, organophosphorus&pyrethroid mixed and amitraz compounds were most commonly encountered in the age group of 21-30 years. Kerosene was encountered only in the age group of 0-10 years. The

present study helps to interpret pattern of poisons in various age groups in acute poisoning cases. The vulnerable age group for a particular type of poison should be identified and proper preventive measures should be taken.

Keywords: Acute poisoning, age group and type of poison

Introduction:

Since the dawn of recorded history poisons have had a great impact on human events. And although over the millennia the important poisons of the day have changed to some degree, toxic substances continue to challenge our everyday living. The ancients were undoubtedly much more knowledgeable than many of us about the benefits and drawbacks of medicinal and poisonous plants, lessons that would serve us well as additional herbal concoctions flood our marketplace leading to some of our more challenging present day poisonings.⁽¹⁾ Today insecticide and pesticide are used worldwide in agriculture as well as in most household gardens. This easy availability of compound has resulted in gradual increase in accidental and suicidal poisoning mainly in developing countries.⁽²⁾

Now days accidental and suicidal poisoning is a significant contributor to mortality and morbidity throughout the world and is increasing in India. More than 50,000 individuals from all age group die of poisoning every year.⁽³⁾ So it is imperative to find out type of poisoning in particular age groups involving acute poisoning, as it will immensely help the health policy makers to reduce the mortality and morbidity due to poisoning. So the present study is carried out at Pravara Rural Hospital and Rural Medical College of Pravara Institute of Medical Science, Loni to study pattern of poisons in various age groups in acute poisoning cases.

Aims and Objectives: To study pattern of poisons in various age groups in acute poisoning cases.

Material & Methods:

This hospital based prospective cross sectional study was carried out over a period of two years duration from 01/09/2008 to 31/08/2010 after approval by Institutional Ethics and Research committee at Rural Medical College, Loni and Pravara Rural Hospital, of Pravara Institute of Medical Sciences, Loni.

All admitted and brought dead cases of acute poisoning, cases of known and unknown bites and stings from all age were included in the study. All cases of chronic poisoning, poisoning cases admitted and referred to other hospitals, absconded cases, brought dead cases without history of acute poisoning, cases admitted without history of poisoning, bites and stings were excluded from the study.

Comprehensive proforma for the study was designed which contained age of the patient of acute poisoning and type of poisoning. Information about the relevant facts pertaining to the type of poisoning was gathered by directly interviewing the patient (wherever possible) or the relatives, friends or those accompanying the patient after obtaining the written, informed consent and also from the investigating police authority. Relevant data of the individual poisoning cases was collected from medico-legal cases register of casualty, case papers from concerned department, inquest, post-mortem reports, chemical analysis report after taking informed consent from patient or relatives. The type of poisoning was decided depending upon the history given by the patient (if possible) and /or relatives of the patient, friends or those accompanying the patient and police & from medical records. If there was no

specific history about type of poison, then type of poison was considered to be unknown. In fatal cases of acute poisoning, type of poison was determined after postmortem examination and chemical analysis report. In cases of fatal acute poisoning, if chemical analysis report was pending then type of poison was considered to be pending. Data was statistically

analyzed using statistical software SPSS Statistic 17 and Microsoft Office Excel 2003. Data was analyzed in the form of percentage (%) and proportion.

Observations & Results:

During the study period, total 557 cases of acute poisoning were recorded.

Table : Distribution of type of poisons according to age group in acute poisoning cases: (n=557)

Type of poison	Age in years								Total
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Organophosphorus	04 (00.72)	15 (02.70)	46 (08.26)	25 (04.49)	09 (01.62)	03 (00.54)	01 (00.18)	03 (00.54)	106 (19.03)
Organochlorine	01 (00.18)	06 (01.08)	07 (01.26)	06 (01.08)	02 (00.36)	00 (00.00)	00 (00.00)	01 (00.18)	23 (04.13)
Pyrethroid	02 (00.36)	08 (01.44)	07 (01.26)	04 (00.72)	00 (00.00)	01 (00.18)	00 (00.00)	00 (00.00)	22 (03.95)
Organophosphorus and Pyrethroid	01 (00.18)	01 (00.18)	08 (01.44)	02 (00.36)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	12 (02.15)
Formamidine pesticide- Amitraz	11 (01.97)	21 (03.77)	37 (06.64)	05 (00.89)	05 (00.89)	02 (00.36)	00 (00.00)	00 (00.00)	81 (14.54)
Zinc phosphide	01 (00.18)	01 (00.18)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	02 (00.36)
Corrosives	01 (00.18)	01 (00.18)	01 (00.18)	03 (00.54)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	06 (01.08)
Kerosene	24 (04.30%)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	24 (4.31)
Sedative tablets	01 (00.18)	00 (00.00)	02 (00.36)	01 (00.18)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	04 (00.72)
Antiepileptic tablets	01 (00.18)	01 (00.18)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	02 (00.36)
Haematinics	01 (00.18)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	01 (00.18)
Antipsychotic tablets	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	01 (00.18)	00 (00.00)	00 (00.00)	00 (00.00)	01 (00.18)

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Analgesics and Antipyretics tablets	00 (00.00)	01 (00.18)	02 (00.36)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	03 (00.54)
Muscle relaxant tablets	00 (00.00)	00 (00.00)	01 (00.18)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	01 (00.18)
Antihypertensive tablets	01 (00.18)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	01 (00.18)
Vasculotoxic snake bite	09 (01.62)	11 (01.97)	09 (01.62)	05 (00.89)	08 (01.44)	03 (00.54)	03 (00.54)	00 (00.00)	48 (08.61)
Neurotoxic snake bite	04 (00.72)	06 (01.08)	10 (01.80)	04 (00.72)	03 (00.54)	04 (00.72)	01 (00.18)	00 (00.00)	32 (05.75)
Non poisonous snake bite	06 (01.08)	06 (01.08)	20 (03.59)	09 (01.62)	06 (01.08)	01 (00.18)	05 (00.89)	02 (00.36)	55 (09.87)
Scorpion bite (sting)	17 (03.05)	01 (00.18)	01 (00.18)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	19 (03.41)
Unknown bite	04 (00.72)	04 (00.72)	14 (02.51)	07 (01.26)	03 (00.54)	05 (00.89)	00 (00.00)	00 (00.00)	37 (06.64)
Castor seeds	06 (01.08)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	06 (01.08)
Dhatura seeds	02 (00.36)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	02 (00.36)
Ganja (Cannabis)	00 (00.00)	00 (00.00)	00 (00.00)	02 (00.36)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	02 (00.36)
Unknown tablets	01 (00.18)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	01 (00.18)
Carbamates	00 (00.00)	01 (00.18)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	01 (00.18)
Ethyl alcohol	00 (00.00)	00 (00.00)	02 (00.36)	00 (00.00)	01 (00.18)	00 (00.00)	00 (00.00)	00 (00.00)	03 (00.54)
Food poisoning	00 (00.00)	00 (00.00)	03 (00.54)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	03 (00.54)
Unknown	03 (00.54)	14 (02.51)	20 (03.59)	04 (00.72)	01 (00.18)	00 (00.00)	00 (00.00)	00 (00.00)	42 (07.54)
Pending	00 (00.00)	02 (00.36)	05 (00.89)	03 (00.54)	03 (00.54)	02 (00.36)	01 (00.18)	01 (00.18)	17 (03.05)
Total	101 (18.13)	100 (17.45)	195 (35.01)	80 (14.36)	42 (07.54)	21 (03.77)	11 (01.97)	07 (01.26)	557 (100)

Organophosphorus compounds were most commonly encountered in the age group of 21-30 years [46 (08.26%)] followed by 31-40 years [25 (04.49%)] and 11-20 years [15 (02.70%)] and least in the age group of 61-70 years [1 (00.18%)], 51-60 and 71-80 years with 3 (00.54%) cases each. Organochlorine compounds were most commonly encountered in the age group of 21-30 years [7 (01.26%)] followed by 31-40 years and 11-20 years with 6 (01.08%) cases each and least in the age group of 71-80 years and 0-10 years with 1 (00.18%) case each. 2 (00.36%) cases of organochlorine compound poisoning were seen in the age group of 41-50 years. Not a single case of organochlorine compound poisoning was found in 51-60 and 61-70 years of age group.

Pyrethroid compounds were most commonly encountered in the age group 11-20 years [8 (01.44%)] followed by 21-30 years [7 (01.26%)] and least in the age group of 51-60 years and 0-10 years with 1 (00.18%) and 2 (00.36%) cases respectively. Not a single case of pyrethroid compound was found in 41-50, 61-70 and 71-80 years of age group. Organophosphorus and pyrethroid mixed compounds were most commonly encountered in the age group 21-30 years [8 (01.44%)] followed by 31-40 years [2 (00.36%)] and least in the age group of 0-10 years and 11-20 years with 1 (00.18%) case each. Not a single case of organophosphorus&pyrethroid mixed compound poisoning was found in 41-50, 51-60, 61-70 and 71-80 years of age group. Formamidine pesticide- Amitraz was most commonly encountered in the age group of 21-30 years [37 (06.64%)] followed by 11-20 years and 0-10 years with 21 (03.77%) and 11 (01.97%) cases respectively and least in the age group of 51-60 years [2 (00.36%)]. In the age group of 31-40 and 41-50 years 5 (00.89%) cases each of formamidine pesticide- Amitraz was

found. Not a single case of formamidine pesticide- Amitraz poisoning was found in 61-70 and 71-80 years of age group.

Kerosene was encountered only in the age group of 0-10 years [24 (04.30%)]. In no other age group kerosene poisoning was found. Maximum number of snake bite cases were in the age group of 21-30 years with 7% of cases. Scorpion bite (sting) was most commonly encountered in the age group of 0-10 years [17 (03.05%)] and least in the age group of 11-20 and 21-30 years with 1 (00.18%) case each. Not a single case of scorpion bite (sting) was found in age group of 31-80 years. Unknown bites were most commonly encountered in the age group of 21-30 years [14 (02.51%)] followed by 31-40 years [7 (01.26%)] and then 51-60 years with 5 (00.89%) cases and least in the age group of 41-50 years [3 (00.54%)]. In the age group of 0-10 and 11-20 years 4 (00.72%) cases each were found. Not a single case of unknown bite was found in 61-70 and 71-80 years of age group.

Unknown poisons were most commonly encountered in the age group of 21-30 years [20 (03.59%)] followed by 11-20 years [14 (02.51%)] and least in the age group of 41-50 years [1 (00.18%)]. In the age group of 0-10 and 31-40 years 3 (00.54%) and 4 (00.72%) cases of unknown poisoning respectively were found. Not a single case of unknown poisoning was found in 51-60, 61-70 and 71-80 years of age group. In the age group of 0-10 years the poisons encountered were castor seeds [6 (1.08%)], dhatura seeds [2 (00.36%)], unknown tablets [1 (00.18%)], antihypertensive tablets [1 (00.18%)] and hematinics [1 (00.18%)]. These poisons were not encountered in any other age group.

Food poisoning was encountered only in the age group of 21-30 years [3 (00.54%)]. It was not

encountered in any other age group. Ethyl alcohol was most commonly encountered in the age group of 21-30 years [2 (00.36%)] followed by 41-50 years [1 (00.18%)]. It was not encountered in any other age group. One (00.18%) case of carbamate poisoning encountered was in the age group of 11-20 years. It was not encountered in any other age group. Two (00.36%) cases of ganja (cannabis) poisoning encountered were in the age group of 31-40 years. It was not encountered in any other age group. One (00.18%) case of muscle relaxant tablet poisoning encountered was in the age group of 21-30 years. It was not encountered in any other age group. One (00.18%) case of antipsychotic tablet poisoning encountered was in the age group of 41-50 years. It was not encountered in any other age group. One (00.18%) case of each, zinc phosphide and antiepileptic tablets poisoning was encountered in the both age group i.e. in 0-10 and 11-20 years. It was not encountered in any other age group.

Corrosive poisoning was most commonly encountered in the age group of 31-40 years [3 (00.54%)] followed by 0-10, 11-20 and 21-30 years with 1 (00.18%) case each. Not a single case of corrosive poisoning was found in 41-80 years of age group. Sedative tablets poisoning was most commonly encountered in the age group of 21-30 years [2 (00.36%)] followed by 0-10 and 31-40 years with 1 (00.18%) case each. Not a single case of sedative tablet poisoning was found in any other age group. Analgesic and antipyretic tablets poisoning was most commonly encountered in the age group of 21-30 years [2 (00.36%)] followed by 11-20 years with 1(00.18%) case. Not a single case of acute poisoning due to analgesic and antipyretic tablets was found in any other age group.

Discussion:

During the study period, total 557 cases of acute poisoning were recorded. Due to non availability of literature, we could not compare age wise variation of all types of poison which were observed in present study, but comparison of age wise variation of types of poison was done as per available literature.

In the present study organophosphorus, organochlorine, organophosphorus & pyrethroid mixed and amitraz compounds were most commonly encountered in the age group of 21-30 years. Similar finding were reported by DG Gannur⁽⁴⁾ who reported from study on organophosphorus compound and stated the most commonly encountered age group as 21-30 years with 45.62% cases. This may be due to fact that these poisons are insecticides and were easily available in the agricultural sector which is the most common profession in this rural area and this 21-30 years of age group is commonly employed in the agricultural sector. Kerosene was encountered in 4.31% cases, only in the age group of 0-10 years i.e. pediatric age group and this similar finding was reported by Sheikh NA⁽⁵⁾ with 27.65% cases. This may be due to fact that kerosene is extensively used as a fuel for cooking and lighting in this rural area where load shedding of electricity is the major problem. Moreover kerosene is stored in soft drink and beer bottles which remains within easy reach of curious children⁽⁵⁾ and vulnerability of the preschool age group could be due to inherent inquisitiveness and high oral exploratory activity aided by their newly acquired mobility and hand skills⁽⁴⁾.

In the age group of 21-30 years 7% cases of snake bite were found which was maximum amongst all other age groups in the present study. BatraAK⁽⁶⁾ also reported maximum number of snake bite cases in the age group of 21-30 years with 20.8% cases.

Scorpion bite (sting) was encountered in 03.41% cases in the age group of 0-10 years. Singhal A et al⁽⁷⁾ in their study conducted only on scorpion bites has reported a much higher number of cases (40.54%) in the age group of 5-15 years. Scorpions commonly inhabit the crevices of dwellings, underground burrows, the areas under logs or debris, paddy husk, sugarcane fields and coconut and banana plantations⁽⁷⁾ which are common in this rural area and parental negligence give access to the children to explore such sites leading to more chances of scorpion bite in this age group.

Unknown bite was most commonly encountered in the age group of 21-30 years and may be due to the fact that individuals in this age group are commonly engaged in agricultural activities who also work at night in the farm in this rural area and rural agricultural region is natural habitat for various animals and flies. Castor seeds, dhatura seeds, unknown tablets, antihypertensive tablets and hematinics were encountered only in the age group of 0-10 years and similar findings were observed by Sheikh NA⁽⁵⁾ in the study done on childhood poisoning in 0-15 years of age group and this may be due to fact that children may have accidentally ingested these seeds and pharmaceutical drugs due to parental negligence, curiosity and lack of knowledge.

Food poisoning was encountered only in the age group of 21-30 years. This may be due to fact that this young age group is very active with lot of

friends and this age group needs to take outside food which may have been contaminated. Ethyl alcohol was most commonly encountered in the age group of 21-30 years and may be due to fact that this age group usually has influence of peer pressure than ethical and family values which leads to indulgence into various habits like drinking.

Conclusion:

Kerosene was encountered only in the age group of 0-10 years. Maximum snake bite cases were in the age group of 21-30 years. Scorpion bite (sting) was most commonly encountered in the age group of 0-10 years. Castor seeds, dhatura seeds, unknown tablets, antihypertensive tablets and hematinics were encountered only in the age group of 0-10 years. Food poisoning was encountered only in the age group of 21-30 years. Ethyl alcohol was most commonly encountered in the age group of 21-30 years.

The present study helps to interpret pattern of poisons in various age groups in acute poisoning cases. It is imperative to identify these trends in acute poisoning, as it will immensely help the health policy makers to reduce the mortality and morbidity due to suicidal poisoning. The vulnerable age group for a particular type of poison should be identified and proper preventive measures should be taken. Health education program for prevention of poisoning should be designed and implemented for the benefit of the public at large.

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