Current Trends Of Poisoning In Surat Region Of Gujarat: A Prospective Study

[1]Pranav Prajapati, [2]Jignesh Brahmbhatt
[1]Associate Professor, [2]Tutor cum Post Graduate Student,
Forensic Medicine & Toxicology Deptt.,
Surat Municipal Institute of Medical Education and Research, Surat, Gujarat.

ABSTRACT

Background: Poisoning is a major epidemic of non-communicable disease in the present century. **Aims & Objectives:** The aim of this study was to analyze the patterns, incidence, social factors and the clinical outcomes of poisoning cases in Surat region of Gujarat. **Material and Method:** The present prospective study was undertaken in the Forensic Medicine Dept, SMIMER, Surat to know the pattern of fatal poisoning. Total 151 cases of death due to fatal poisoning in the year of 2014 were selected for the study. Record of FSL reports and cause of death were analyzed. **Results:** Male group predominated over female group with ratio of 2.43:1 and maximum victims of poisoning belong to 21-30 years of age. The Highest number of poisoning cases were found in July (13.25%) and January (11.92%) especially in labour group (44.37%). Alluminium Phosphide (60.93%) was the most common consumed poison by the victims of suicide. **Conclusion:** Reducing the death from self poisoning required prevention strategies like increasing tolerance power, meditation, changing attitudes, knowledge and beliefs about pesticides, controlling access to dangerous pesticides and improving the medical treatment of poisoning.

Key-words: Poisoning, Pesticide, Insecticide, Fatal.

Corresponding Author: Dr. Pranav Prajapati, Associate Professor, Forensic Medicine & Toxicology Deptt., Surat Municipal Institute of Medical Education and Research, Surat-395010, Gujarat, India. Email: pprajapati79@gmail.com

INTRODUCTION

Poisons are working as double edged weapon which depends on its use and overuse with various aspects. Any substance wether solid, liquid or gasesous material when used in huge amount, it become poison to all livings of the world. At present, due to the vast development of every state and country by developing industries, medicines and agriculture, a significant number of new compounds have appeared as new poisonous substances. Poisoning may be acute or chronic. Acute poisoning forms one of the common causes of emergency hospital admissions. Pattern of poisoning in a region depends on variety of factors, such as availability of the poisons, socio-economic status of the population, religious and cultural influences and availability of drugs. The severity and outcome in such cases are determined by a number of factors such as chemical and physical properties of the poison, amount consumed, mode of poisoning and individual characteristics like the functional reserve of the individual or target organ, which is further influenced by age and pre-existing disease.[1]

Pesticides comprise a wide range of compounds including insecticides, herbicides, fungicides and others. Thus, far more than 1000 active substances have been incorporated in approximately 35,000 various preparations of pesticides used in agriculture. Morbidity and

mortality aspects of poisoning cases varies from country to country depending on the nature of poison and availability of facilities and treatment by qualified doctors. Among children the commonest culprits include kerosene, household chemicals, drugs, pesticides and garden plants.[2] Among the adults, females predominate in all age groups, with an evident preponderance in the second and third decades of life. Acute poisoning in children is almost entirely accidental, while in adults it is mainly suicidal.

The huge burden of poisoning cases encountered in emergency department of any government or private hospital may be attributed due to easy availability of insecticides and other household poisons and these resulted usually from self-inflicted action. A number of hospital-based retrospective studies in India have shown an increasing incidence of pesticide poisoning during the last decade. Organophosphates, alluminium phosphide and rodenticide are most often involved in such poisonings. Plant poisonings, snake envenomation and accidental kerosene poisoning in children are also common.[3] The poisoning may be suicidal, accidental or homicidal. Organophosphorus (OP) compounds can produce significant pesticide related illnesses and death in developing countries, including India.

MATERIAL AND METHOD

The prospective study on suspected poisoning cases of 2014 was conducted in the Department of Forensic Medicine and Toxicology, Surat Municipal Institute of Medical Education and Research, Surat, Gujarat, India. Total 151 cases were included in the category of poisoning on the basis of confirmation/suspicion by the investigating officer or/and confirmatory or corroborative findings of post-mortem examination and forensic science laboratory reports.The demographic characteristics of victims of poisoning (age, sex, marital status, occupation, motive, nature of poison etc.) were recorded at the time of autopsy examination and from FSL reports. Samples of viscera and blood were analyzed in the FSL Surat by various method like thin layer chromatography, HPLC, gas chromatography etc. The data/findings of the examinations were recorded in the proforma, coded into a chart and analyzed. The analysis was done using SPSS (Statistical Package for Social Science)11.5 version.

RESULTS

Table-1: Distribution of poisoning cases according to marital status and sex.

Sex	Marital status		Total	%
	Married (%)	Unmarried (%)		
Male	97 (64.24%)	10 (6.62)	107	70.86
Female	37 (24.50%)	7 (4.64%)	44	29.14
Total	134 (88.74%)	17 (11.26%)	151	100

Out of 1878 medico-legal autopsies, 151 (8.04%) cases were of poisoning. Among them 70.86% of total poisoning cases were belongs to male group while 29.14% belongs to female group. Male group predominated over female group with ratio of 2.43:1. 88.74% cases were married persons while only 11.26% of total cases were unmarried.

Table-2: Distribution of poisoning cases according to age group.

Age group (years)	No. of cases	%
0-10	02	1.32
11-20	15	9.93
21-30	53	35.10
31-40	36	23.84
41-50	20	13.24
51-60	16	10.60
61-70	03	1.99
71-80	06	3.98
Total	151	100

Among the total cases, 35% of victims of poisoning belongs to third decade followed by forth decade. First decade and the eight decade were the least affected group in poisoning.

Table-3: Distribution of poisoning cases according to month wise

Month	No. of cases	%
January	18	11.92
February	12	7.95
March	14	9.27
April	06	3.97
May	09	5.96
June	08	5.30
July	20	13.25
August	15	9.93
September	10	6.62
October	13	8.61
November	10	6.62
December	16	10.60
Total	151	100

The Highest number of poisoning cases were found in July (13.25%) and January (11.92%) while least one was found in April (3.97%), May (5.96%) and June (5.30%).

Table-4: Distribution of poisoning cases according to occupation wise.

Occupation	No.of cases	%
Service	09	5.96
Labour	67	44.37
House wife	27	17.88
Business	13	8.61
Student	24	15.89
Retired life	11	7.29
Total	151	100

Poisoning cases were found higher in labour group (44.37%) followed by housewife group (17.88%), student and business class. Only 7.29% of total poisoning cases were belong to retired life group.

Table-5: Distribution of poisoning cases according to nature and manner of poisons.

Name of poison	No. Of cases (%)	Manner of death		
		Suicidal	Homicidal	Accidental
Aluminum Phosphide	92 (60.93%)	92 (60.93%)	0	0
Zinc Phosphide	01 (0.66%)	01 (0.66%)	0	0
Hydrochloric Acid (HCL)	22 (14.57%)	0	2 (1.32%)	20(13.25%)
Nitric Acid (HNO3)	01 (0.66%)	0	0	01 (0.66%)
Phenyl	02 (1.32%)	0	0	02 (1.32%)
Methyl Parathion	06 (3.97%)	06 (3.97%)	0	0
Chlorpyriphos	01 (0.66%)	01 (0.66%)	0	0
Monochrotophos	02 (1.32%)	02 (1.32%)	0	0
Propoxur(carbamate)	06 (3.97%)	06 (3.97%)	0	0
Endosulfan	03(1.98%)	03(1.98%)	0	0
Dichlorovos	01 (0.66%)	01 (0.66%)	0	0
Quinalphos	03(1.98%)	03(1.98%)	0	0
Undetected	11 (7.29%)	06 (3.97%)	0	05 (3.31%)
Total	151 (100%)	121 (80.13%)	2 (1.32%)	28 (18.54%)

Aluminium Phosphide (60.93%) was the most common consumed poison by the victims of suicide followed by Hydrochloric acid (14.57%). 60.93% of total poisoning cases were consumed poison for suicidal purpose. 13.25% poison cases were belongs to accidental while only 2 cases (1.32%) were of homicidal purpose. Second most ideal suicidal poison is Methyl Parathion (3.97%) and Propoxur (Carbamate) (3.97%). Accidental poisons were Hydrochloric acid, Nitric Acid (HNO3), Phenyl.

DISCUSSION

Organophosphate compounds are most commonly used among them and are gradually increasing cause of accidental and suicidal poisoning, with high morbidity and mortality rates, especially in developing countries. Organophosphate compounds may be taken via the oral, respiratory, or trans-dermal routes. Organo-phosphorus pesticide self-poisoning is estimated to kill around 200,000 people each year, largely in the Asia-Pacific region and the mortality rate varies from 10-20%.[3] A majority of the victims were in the age group of 21-30 years (in the present study, it was 35.10%), which is similar to that in other studies.[4,5,6,7,8] This age group was the most active one, physically, mentally and socially and so, it was more prone to stress during life. The males were more involved as compared to females. In our study 70.8% were males.These findings are similar to findings of other studies conducted by Reddy et al[9] shows that 65.65% of cases were male.[9]According to study of Vinay Shetty et al,[10] 51.5% of cases were males. Dask et al[11] has reported the Male: Female ratio being 2.5:1, in our study Male: Female ratio being 2.43:1. This high incidence is attributed to point that males are more exposed to stress and strain and have the energetic life.

Married male person have more responsibility than married female due to

balancing in outer environment of market or working places as well as internal environment of family in big cities. Nuclear family status is also one of the factor for suicidal tendency in present time which become more stressful because of growing competitions and increased demands on the part of individuals. Self-poisoning is one of the oldest methods tried for committing or attempting suicide, only the substances is used for poisoning change from time to time and place to place. Increasing stress and strains in life and diminished mental strength to cope up with this stress may be the reason behind this; other reasons may be free and easy availability, social problems like marital disharmony, economic hardship, disagreement, scolding, un-employment, adjustment problem, quarrel with other members etc.[11] Carbamate-Propoxure and Alluminium phosphide poisoning deaths are commonest because of being cheap, easily available without any restriction in market as Baygone Spray for Carbamate-Propoxure and Celphos, Alphos, Quickphos, Phostoxin, Phosphotex etc. for Alluminium Phosphide, highly efficacious and non-availability of specific antidote.[12,13.] In our study incidence, alluminium phosphide (61%) and carbamate propoxur (4%) poisoning was maximum. Study of Reddy[9] showed 65.3% incidence of organ phosphorus poisoning. The study of Shetty[10] showed incidence of Alluminium phosphide maximum, whereas study of Sharma showed maximum incidence of sulphuric acid. 80% of total cases consumed different substances as a poison to end their life as suicide while accidental poisoning cases were of only 18% and organo-phosphurus substances are rarely used for homicidal purpose. Here in this study two case of Hydrochloric acid poisoning were of vitriolage. Our study is consistent with the findings of Gopal et al.[14] The present study had more number of OP cases from the urban areas as compared to other studies, because now a days these compounds are easily available in the urban areas. This hospital catered to an urban population and so there were more urban cases. Even we could think of changing trends in the urban population.

CONCLUSION

It is obvious that the younger generation has become the victims of OP poisoning, with the number of cases increasing every year. It is essential to strengthen the legislature on the availability of the OP compounds and it is also more essential to strengthen the preventive measures like educating people through drug awareness programme, promoting poison information centers, introducing separate toxicological units in hospitals and upgrading the peripheral health centers to manage the cases of OP poisoning in an emergency. So, to conclude, it is important to design an appropriate health education programme for the prevention of both suicidal and accidental OP poisoning for the benefit of the public at large.

Conflict of Interests: No conflict of interests.

Source of Funding: Nil.

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