

Study of Frequency Distribution of Corrosive Poisoning Cases Among Females with Special Reference to Dowry Deaths

K. Parvathi¹, Ravikanth Soni², Sugatha¹, M Narayan Reddy³

ABSTRACT

Introduction: Caustics cause both clinical and histological damage on contact with tissue surfaces. Caustics exist in both solid and liquid forms, with differences in viscosity, concentration of solution, and pH. An acid is a chemical substance whose aqueous solutions are characterized by a sour taste and their ability to turn blue litmus to red and which causes marked injury, when the pH is below 3. The amount of injury depends on time of contact, strength of the substance to penetrate tissues; volume, pH, and concentration; stomach contents; and titratable acid reserve. The aim of this study is to analyse the incidence of corrosive poisons, incidence of corrosive poisoning among the age and sex distribution, incidence of corrosive poisoning among married females.

Material and methods: The study was carried on at Mortuary of Osmania General Hospital during 2003-2006. During this period 1135 cases of various poisoning deaths were registered. Among them 62 deaths were due to corrosive poisoning. All the reported cases in the study period were investigated.

Results: A study of 1135 cases of various poisoning during 2003-2006, of which 62 corrosive poisoning fatalities. Among the 62 deaths caused due to corrosive poisoning 27 cases were of females who constituted 43.5% of cases of death due to corrosive acid poisoning. 9 dowry deaths were due to corrosive poisoning.

Conclusion: The incidence of corrosive poisoning is found to be higher and among married women. Corrosives are more often the choice of poison due to its ease of access.

Keywords: Titratable acid reserve (TAR), Corrosive poisoning, Corrosive acid

INTRODUCTION

A corrosive agent is a substance that causes both functional and histological damage on contact with body surfaces. In developed countries, higher levels of education and increased product regulation have decreased morbidity and mortality from caustic exposures in children as well as in adults. However, in developing and underdeveloped nations, exposure to caustics remains a major problem.¹⁻⁴ The challenges to prevention of exposure and patient care include lack of childproof containers, Unregulated and easy access to corrosive substances, cultural-specific propensity to consume caustics in suicidal attempts, high volume of cases, absence and hindrances to care in rural settings, undernourishment, and poor follow-up of the survivors.⁴ incidence of Ingestion of Alkaline is higher in the developed world.⁵ Whereas incidence of ingestion of acid is higher in developing countries.⁶

Caustic exposures are of three types: (1) intentional ingestions with suicidal tendency⁷; (2) accidental ingestions⁸ and (3) other incidental, mostly occupational contact exposure. The common reported cases are of accidental or unintentional, even if less frequent, suicidal ingestions account for the most

of grave injuries.¹ The geographic variation in caustic ingestion circumstances, such as involved substances, intention, age of the patient, and extent of evaluation, make it difficult to create encompassing recommendations or a consensus approach.^{4,9,10}

As early as 1927, the United States mandated warning labels on acid containing products, which led to dramatic decrease in incidence of unintentional corrosive injuries in children. Unfortunately, children in developing nations, like India, do not benefit from these interventions, as such safety considerations are not globally used. In a study although children comprised 39% of admissions for corrosive ingestions, adults comprised 81% of patients requiring treatment.¹¹

These compounds are easily available and thus became popular for suicidal and homicidal purposes, Homicidal is by throwing this compounds over the face and body of the person. Accidental deaths are due to taking these compounds mistakenly.

Following the knowledge of highly lethal nature of these compounds, people have started using them in great number particularly for the suicidal purposes. The methods adopted by prospective suicides have undergone a revolution in recent times. In Andhra Pradesh, poisoning due to the corrosive compounds on the increase year after year.

It is almost a matter of day -to-day occurrence that not only married women are harassed, humiliated, beaten and forced to commit suicide, leave husband, etc., tortured and ill-treated but thousands are torched to death as parents are not able to meet the dowry demands of greedy in-laws or their husbands.

In our study, we studied the pattern poisoning among females with special reference to dowry deaths, we also suggested certain parameters for early detection and treatment.

Aims and objectives of the study were to find the most common and least common corrosive poisons in accidental poisoning and suicidal or homicidal, the frequency of dowry deaths among the female casualties and the frequency of fatal cases of corrosive poisoning with regard to their marital status.

MATERIAL AND METHODS

A study of 1135 cases of various poisoning, of which 62 corrosive poisoning fatalities both clinical and autopsied at the Department of Medicine and Department of Forensic Medicine,

¹Associate Professor, ²Senior Resident, ³Retired Professor, Department of Forensic Medicine and Toxicology, Osmania Medical College, Hyderabad, India

Corresponding author: Dr. K Parvathi, Associate Professor, Department of Forensic Medicine and Toxicology, Osmania Medical College, Hyderabad, India

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Osmania General Hospital, Hyderabad has been made after obtaining a informed consent waiver form the institutional ethics committee

The records maintained at the Department of Medicine and the Department of Forensic Medicine, Osmania General Hospital, includes copies of the following:

1. Hospital case sheet extracts.
2. Police requisition and inquest reports.
3. Reports of clarification of the circumstances surrounding the death.
4. The post-mortem report.
5. Forensic Science laboratory reports of the chemical analysis of viscera of the deceased.

Information was also extracted from the relatives, attenders and eyewitnesses (in some cases), regarding the mode of poisoning and the type of poison used.

In all cases where a poison was detected in the viscera sent for analysis to the Forensic Science Laboratory was considered as a case as of "Poison Fatality". This was because in some cases, if the chemical analysis report was received as negative, it was not considered for the study as the precise cause of death was not identified and at best a calculated guess would have been made. All the records of the poisoning fatalities were studied in detail and statement prepared to show the frequency of individual poisons, age and sex distribution, the average time of survival as shown in the tables.

Taking into consideration the history given in the inquest report, the age of the deceased, the nature of the poison responsible for death and any other available information an opinion to the manner of death was made. The history given by the police should only be taken as a hint. The autopsy findings should always prevail upon the history furnished in case of any inconsistencies between the two.

STATISTICAL ANALYSIS

SPSS version 21 was used for data analysis. Chi square test was used for comparison. Descriptive statistics like mean and percentage were also used.

RESULTS

During the study period there were 1135 cases of various poisoning, of which 62 corrosive poisoning fatalities were observed the following observations were made. Table-1 shows the distribution of all poisoning cases among males and females. Among all the cases of poisoning males outnumbered the females and among the total number of cases females constituted 36.2 % of all cases of poisoning. The P-Value was < 0.00001. The result was significant at $p < 0.05$.

Among the 62 deaths caused due to corrosive poisoning 27 cases were of females who constituted 43.5% of cases of death due to corrosive acid poisoning (table-2). The P-Value was 0.000291.

Type of corrosive	Male	Female	Total	Percentage
Sulphuric acid	15	11	26	42
Carbolic acid	10	08	18	29
Nitric acid	10	06	16	25.8
Paraphenylene Diamine + Ammonium Hydroxide	00	01	01	1.6
External acid burns	00	01	01	1.6

Table-5: Frequency of use of different type of corrosives

The result was significant at $p < 0.05$.

Of all the cases of deaths due to corrosive acid poisoning among females it was observed that 43.5% of the females were married (table-3). The chi-square statistic was 1.1428. The p -value was .285052. This result was not significant at $p < .05$

When we compared the death of females with respect to dowry harassment, among all the death of married females 64 cases were of dowry death out of 233 cases of death of married females due to poisoning, and 9 deaths were dowry deaths out of 19 deaths of married females constituting 47.4% of dowry deaths due to corrosive acid poisoning among married female deaths (table-4). The chi-square statistic was 1.6489. The p -value was .199107. This result was not significant at $p < .05$.

Among all the corrosives sulphuric acid was the choice of corrosive among both males and females constituting 42% of all cases next most common was carbolic acid with 29 % of cases followed by nitric acid used by 25.8 % of the cases (table-5).

The chi-square statistic was 2.8528. The p -value was .582745. The result was not significant at $p < .01$.

DISCUSSION

Sex Distribution: Sex distribution in this study shows male preponderance. There were 724 males and 411 females in a total number of 1135 cases of poisoning. Corrosive poisonings were 62 out of which 35 male and 27 female fatalities were noted.

Sex	No. of Victims	Percentage
Male	724	63.80 %
Female	411	36.20 %
Total	1,135	100 %

Table-1: Distribution of all poisoning cases among males and females.

Sex	No. of Victims	Percentage
Male	35	56.50 %
Female	27	43.50 %
Total	62	100 %

Table-2: Sex wise distribution among deaths due to corrosive poisoning

Sex	Married	Un Married	Total	Percentage
Male	20	15	35	56.50 %
Female	19	8	27	43.50 %

Table-3: Marital status of deceased due to Corrosive poisoning

Nature of poisoning	No. of married female deaths	No. of dowry deaths	Percentage
Various poisoning	233	64	27.5%
Corrosive poisoning	19	9	47.4%

Table-4: The number of dowry death's among female fatalities.

The male preponderance is due to that all over the world males are seen as the providers and when they fail in doing something, whether professionally or personally; there is a sense of shame, which drives people to suicide. Also as men take more risks and lead a more carefree life. The females lead a less active life and also stay indoors with an overall less amount of exposure to the various poisons.^{5,6}

Marital Status: On studying the marital status of the persons in this study, it is observed that 39 people were married including 20 males and 19 females. And 23 persons were unmarried including 15 males and 8 females. This data suggests that the rate of poisoning fatalities is more among the married population compared to the unmarried population. This may be due to the fact that the married people have more responsibilities, duties and financial burden due to the dependants and consequently get more frustrated and are liable to take their own lives. Also, as a majority of adults are married, the rate of poisoning also reflects this trend. Unmarried people on the other hand are more carefree and “happy go lucky” which explains the lower number of fatal cases.^{6,7}

Dowry Deaths: Of the 19 cases of married females of corrosive poisoning, 9 cases are of Dowry deaths. Dowry death is a multidimensional problem affecting the Indian society at-large and the young, innocent, recently married women, in particular. This has led to many associated problems and crimes like female infanticide, increased rate of suicides among this age group. Many people are unable to afford a girl child’s marriage.⁸ This is especially true in the low socio-economic classes of society.

Manner of Poisoning: In this study, the manner of death was found to be suicidal in a large number of cases (91.9%), followed by accidental (4.9%), homicidal (1.6%) and unknown (1.6%). The high percentage of suicides by corrosive poisoning is due to known toxicity of these agents and also their easy availability and relative cheapness. They are usually found in most Indian homes for floor and toilet cleaning. Suicide is a subject of great sociological and psychiatric importance with many unexamined and unresolved problems. In our country, the study of this particular subject is rendered difficult by the lack of statistics about the number of attempts and successful suicides. It is always interesting to consider the reasons.^{9,11} The police inquests usually mention “chronic ailments”, unbearable pain abdomen, etc., which is not always the whole truth and should always be taken with a pinch of salt. The real cause may be domestic causes, unemployment, financial worries, failures in love, insecurities and psychological problems, which are prone for suicide like manic-depressive psychosis etc.

CONCLUSION

The study highlights the fatal cases of poisoning autopsied at Osmania medical college between January 2003 – June 2006. The incidence of corrosive poisoning is found to be higher and among married women corrosives are more often the choice of poison due to its ease of access. The study emphasises on stricter laws to control the sale and possession of these items and to spread awareness among people about the hazards of corrosive poisoning. The study also brings into focus the evil existence of dowry in our society either in form of physical or psychological trauma and its outcome in form of loss of life.

RECOMMENDATIONS

The main aim of this study has been to ascertain the causes and manner of corrosive poisoning and to suggest remedies to contain and decrease the same. For this we need

- To control the rate of poisoning incidents.
- To decrease number of fatalities among poisoning admissions.
- Setting up emergency poisoning care centres
- 24 hour suicidal helplines
- Setting up poison information centres.
- The public should be made aware about the toxicity of everyday household objects, so as to reduce the incidence of domestic accidental poisoning.
- Appointment of Dowry Prohibition officer by all the State governments.
- Education of women to curb dowry deaths.
- Psychiatric counselling of the survivors.

REFERENCES

1. Contini S, Scarpignato C, Rossi A, Strada G: Features and management of esophageal corrosive lesions in children in Sierra Leone: lessons learned from 175 consecutive patients. *J Pediatr Surg.* 46;1739-40:2011.
2. Ogunleye AO, Nwaorgu GB, Grandawa H: Corrosive oesophagitis in Nigeria: clinical spectrums and implications. *Trop Doct.* 2002;32:78-80.
3. Rodríguez MA, Meza Flores JL: Clinical-epidemiological characteristics in caustics ingestion patients in the Hipólito Unanue National Hospital. *Rev Gastroenterol Peru.* 2003;23:115-120.
4. Contini S, Swarray A, Scarpignato C: Oesophageal corrosive injuries in children: a forgotten social and health challenge in developing countries. *Bull World Health Organ* 2009;87:950-955.
5. Riffat F, Cheng A: Pediatric caustic ingestion: 50 consecutive cases and a review of the literature. *Dis Esophagus.* 2009;22:89-90.
6. Chibishev A, Pareska Z, Chibisheva V, Simonovska N: Clinical and epidemiological features of acute corrosive poisonings. *Med Arh.* 2012;66:11-16.
7. Chibishev A, Pareska Z, Chibisheva V, Simonovska N: Corrosive poisonings in adults. *Mater Sociomed.* 2012;24:125-127.
8. Kay M, Wyllie R: Caustic ingestions in children. *Curr Opin Pediatr.* 2009;21:651.
9. Pace F, Antinori S, Repici A: What is new in esophageal injury (infection, drug-induced, caustic, stricture, perforation)? *Curr Opin Gastroenterol.* 2009;25:372-376.
10. Ekpe EE, Ete V: Morbidity and mortality of caustic ingestion in rural children: experience in a new cardiothoracic surgery unit in Nigeria. *ISRN Pediatr.* 2012: 210632, 2012.
11. Hawkins DB, Demeter MJ, Barnett TE; Caustic ingestion: Controversies in management: A review of 214 cases. *Laryngoscope.* 1980;90:98-109.

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