

ORIGINAL ARTICLE

An Autopsy Based Retrospective Analysis of the Profile of Poisoning Cases at a Tertiary Health Care Centre in Central India Region

Baveja VS,¹ Patel NS,² Nigam M,³ Nigam K,⁴ Agrawal V,⁵ Chouksey VK,⁶ Tomar JS.⁷

Assistant Professor,^{1,6} Associate Professor,^{2,7} Dean,³ MBBS Student,⁴ PG Student.⁵

1. People's College of Medical Sciences and Research Centre, Bhopal

2,3,5,6. Atal Bihari Vajpayee Government Medical College, Vidisha.

4. Nandkumar Singh Chouhan Government Medical College, Khandwa.

7. Mahatma Gandhi Memorial Medical College, Indore.

Abstract :

Acute poisoning is a crucial medical emergency and has remained one of the commonest causes of unnatural deaths. The earlier the initial resuscitations, gastric decontamination and use of specific antidotes, the better the outcome. The aim of this study was to characterize the poisoning cases admitted to the tertiary care health centre in Vidisha district. All cases brought for autopsy between the period January 2022 to December 2023 were evaluated retrospectively. We reviewed data obtained from the medical records as well as the data entries made in the pre-structured formats filled at the time of performing autopsy. It was found that 38% of all medico-legal deaths were due to poisoning. Males constituted 71.27% cases. Maximum victims, 31.38% belonged to the 21-30 years age group. 65.95% of the total victims were found to be married. The place of incidence was found to be indoors in 82% cases and history of addiction was provided in 20% cases. About 39% cases were brought alive to the hospital and the survival period in about 55% of the brought alive cases was less than 24 hours. By means of this study, poisoning has been recognised as one of the most common cause of suicidal mortality. Strengthening of peripheral health centres by means of better treatment modalities along with better access for psychological support and regulation on sale of agricultural poisons can help in curbing the mortality caused as a result of poisoning.

Keywords: Poisons; Agricultural poisons; Mortality; Suicide; Poison information centre.

Introduction :

A forensic autopsy is an examination conducted post mortem to address medicolegal objectives.¹ Poisoning is a serious public health issue in developing countries. Information about poisoning may be helpful for poisoning prevention and hospital treatment, aiding in the development of measures that lower the morbidity and mortality associated with poisoning.² Pesticide poisoning is the most prevalent means of suicide, in low and middle-income nations.³ Various studies done across the world show that poisoning patterns have kept abreast with the developments in the pharmacological and agricultural sciences in that particular geography. Poisoning is not any less a problem in the developed countries as over-the-counter and prescription drugs were found to be the most common agents used as a poison such as Acetaminophen which was found as the most poisoning agent in USA among reproductive-aged women in USA.⁴ The drugs prescribed by doctors have been employed in cases of self-poisoning in UK.⁵ In India, as agriculture is the main occupation, insecticides and other agrochemical fertilizers are used to a greater extent and the poisoning with such products is more common.⁶ The periodic study of the epidemiology of such deaths

is important to as to ascertain the pattern of poisoning in in a specific region.

There are many differences with respect to the pattern and cause of acute poisoning between geographical regions, even within the same country. The knowledge of the general pattern of poisoning in a particular region would help to identify the risk factors and allow early diagnosis and management of such cases, which in turn should result in reduction of morbidity and mortality.⁷ Studies such as this help in the effective and efficient planning helping the amendments in the current policies and/or introduction of new means. The solutions that may arise to mitigate the problem are bi-pronged. Primarily, the intention is to prepare the medical facilities for dealing such cases in a more efficient way reducing the morbidity and consequent mortality rates and secondarily to implement such measures that help in reducing the number of instances wherein there are deaths consequent of poisoning.

Materials and methods:

This is a retrospective study in which all the cases with an alleged history of death as a result of consumption of poisonous substance that were brought to the mortuary of Atal Bihari Vajpayee Government Medical College, Vidisha for autopsy between the period January 2022 to December 2023 were studied. The data from medical records as well as pre-structured formats filled at the time of conducting autopsy, consisting of the demographic profile and postmortem findings were carefully compiled, studied and tabulated in a pre-designed format. This study was approved

Corresponding Author

Dr. Vivek Kumar Chouksey

Email: vivekchoukseymd@gmail.com

Mobile No.: 9891315910

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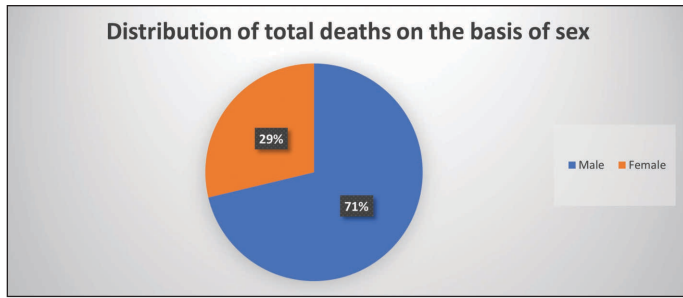


Figure 1: Distribution of total deaths on the basis of sex.

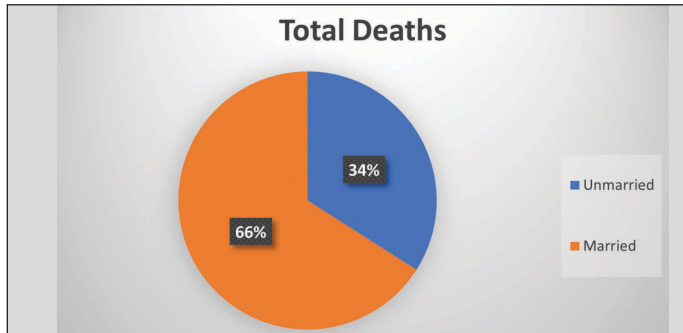


Figure 2. Distribution of total deaths on the basis of marital status.

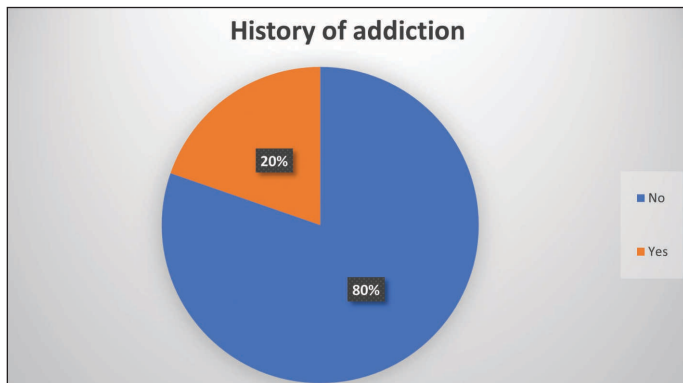


Figure 3. Distribution of total deaths on the basis of history of addiction.

by the Institutional Ethics Committee.

Observation and results:

A total of 494 cases were brought to the mortuary for autopsy during the study period, out of which 188 (38.05%) cases were brought with the alleged history of consumption of poisonous substance. The maximum number of deaths occurred in the month of October (23; 12.23%), closely followed by September and November respectively. The month wise distribution of deaths is depicted in Table 1. In Table 2, the age wise distribution of deaths depicts that the maximum number of cases were found to be of the age group 21-30 years (59; 31.38%) followed by 31-40 years (41; 21.80%). The male sex was found to comprise the maximum number of cases (134; 71.27%) while females comprised of 28.72% cases as is depicted in the Figure 1. Females of the age group 11-20 years (18; 33.33%) were predominantly involved followed by 21-30 years (15; 27.77%). Among all the deceased, majority had marital status married (124; 65.95%) and the remaining were unmarried (64; 34.04) as is depicted in Figure 2. History of addiction was provided in 20% cases whereas in remaining 80% cases there was no such history, as is depicted in

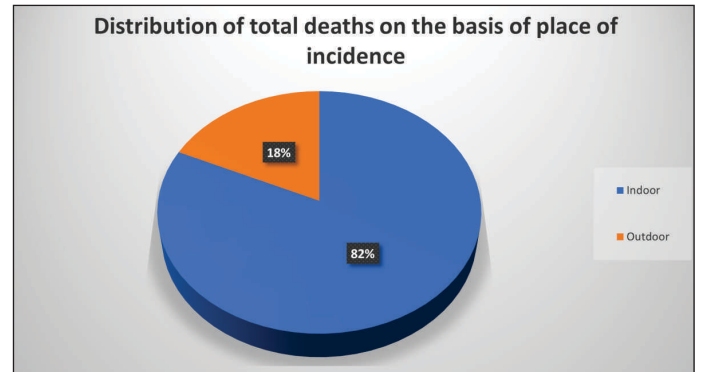


Figure 4: Distribution of total deaths on the basis of place of incidence.

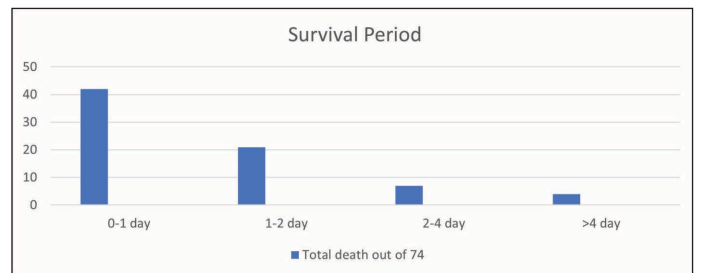


Figure 5: Distribution of total deaths on the basis of survival period.

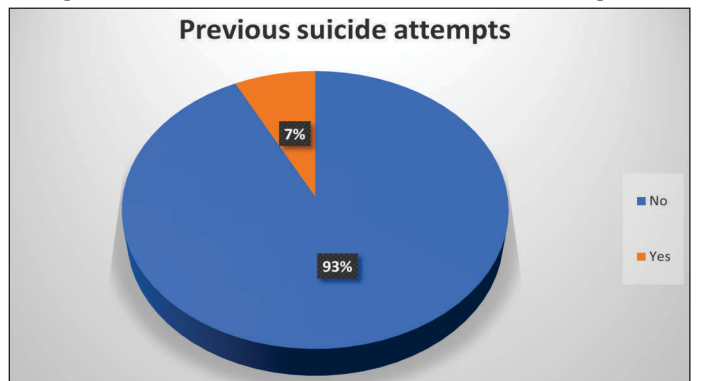


Figure 6: Distribution of total deaths on the basis of previous suicide attempt.

the figure 3. Figure 4 depicts the place of incidence, it was found to be indoors in maximum cases (82%) whereas in the remaining cases it was outdoors. Among all the cases, (74; 39.36%) of the total cases were brought alive to the hospital while the remaining were brought dead. Among the patients who were brought alive, maximum number (41; 55.40%) of cases survived for a period of 0-1 day which is depicted in Figure 5. Gastric lavage was done in most of the cases. In none of the cases the relatives were carrying the sample of poison with them.

Discussion:

Age is a very prominent factor in any epidemiological study as it outlines the population that is at risk. In this study, the age group 21-30 years has been found to have the maximum number of incidences of poisoning irrespective of manner and sexes. This can be attributed to multiple reasons ranging from facing competition in exams or in jobs. A lot of people get married in this age bracket which can also eventually add up to the stress if it does not work out well. This finding has been found to be matching with other studies conducted like that of Patil A,

Table 1. Monthly distribution of deaths.

S No.	Month	Total Deaths (2022+2023)
1	January	12 (6.3%)
2	February	6 (3.1%)
3	March	16 (8.5%)
4	April	14 (7.4%)
5	May	11 (5.8%)
6	June	18 (9.5%)
7	July	15 (7.9%)
8	August	16 (8.5%)
9	September	20 (10.6%)
10	October	23 (12.2%)
11	November	22 (11.7%)
12	December	15 (7.9%)
	Total	188

Table 2. Distribution of death on the basis of age.

S No.	Age	Total Deaths (2022+2023)
1	0-10	1 (0.5%)
2	11-20	34 (18%)
3	21-30	59 (31.3%)
4	31-40	41 (21.8%)
5	41-50	31 (16.5%)
6	51-60	18 (9.5%)
7	61-70	2 (1.06%)
8	71-80	2 (1.06%)
	Total	188

Marigoudar RM, Jatti VB⁸ (21-30 - 34.4%, 31-40 - 19.7%); Pawar V and others⁹ (20-29 years - 45.62%, 10-19 years - 28.81%); Bannur V et al.¹⁰ (21-30 years - 31.4%, 11-20 years - 17.2%); Verma P et al.¹¹ (21-30 years - 40.83%, 31-40 years - 22.50%); Jain AK et al.

In some studies the most commonly involved age group was found to be 11-20 years (36.7%) like in one study conducted by Patel NS et al.¹² Similarly, in a study conducted by Kochar A,¹³ the most prevalent age group was found to be 31-40 years (36%) which is the second most commonly involved age group in our study.

In our study the most commonly involved sex was males, which can be attributed to various factors. Farming happens to be the most common occupation in the region in which this study has been conducted as a result of which pesticides are widely available and most of farming related activities being male-dominated makes the males more susceptible. Also, other factors like stress, unpredictability of income, liabilities etc. can be contributing factors in suicidal poisoning cases. The finding of male predominance in death is concurrent with several other findings like a study conducted by Kumar SV et al.¹⁴ (52.15% males and 47.84% females); Singh S, Sharma BK and Wahi PL,¹⁵ Singh S et al.,¹⁶ Sharma BR et al.¹⁷

While there is uniformity in the higher involvement of male sex in cases of poisoning, there are studies in other countries where the involvement of female sex has also been found to be higher like in a study conducted by Chelkeba L et al.¹⁸

In this study, among various other epidemiological factors, the marital status has also been studied. It has been found that maximum number of victims of poisoning were married. This can be attributed to the stress factor which naturally add up when a

person is married, such as looking after the household expenses in cases where the spouse is not earning, the conflicts, emotional turmoil, planning in the interest of the entire family's future and looking after ageing parents etc. Similar findings have been reported by several other authors in their studies like Parekh U, Gupta S,¹⁹ Datir S et al.²⁰

Conclusion:

Poisoning has been recognised as a very common cause of death, mostly suicidal followed by accidental deaths. Furthermore, agriculture is a prevalent source of earning livelihood in the India, more so in and around the geography of the institution where the study has been conducted. As a result, most common variety of poisonous substance used are insecticide and pesticide compounds.

The approach to reduce the instances of poisoning is multi-dimensional and requires a strategy which is multi-sectoral. There exists a legal framework for the regulation of such compounds both in terms of safety as well as sale in the open market but the actual and optimal implementation of the same still has a long way to go.

Based on the sizable instances of suicidal poisoning cases, there is clearly a lacuna in terms of psychological help that if fulfilled will surely and steadily help in the reduction of the cases of suicidal poisoning.

Also, for the betterment in the quality of treatment being offered to the patients, there is a very good scope of strengthening the backup to the peripheral health care centres like PHCs, CHCs etc by introducing a Poison Information Centre (PIC) at the medical college level in the same district. Additionally, the establishment of toxicological laboratories for detection of poisons at all medical colleges can go a long way in prompt diagnosis and accurate treatment of the patients. Availability of the antidotes of the commonly encountered poisons should be ensured in all the facilities so as to provide prompt treatment.

Health programs conducted by the health care centres can also surely help in spreading awareness about poisoning and thus helping in preventing the instances of accidental and suicidal poisoning.

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