

## Original Article

### A Retrospective overview of Medico Legal Study on poisoning death in Dhaka medical college

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#### Abstract

**Background:** Poisoning deaths are filed as mostly unnatural death in Bangladesh. Both accidental and intentional poisoning is not uncommon. By these deaths are significant contributor to mortality and morbidity day by day. **Objective:** The main objectives of these studies were to find out the incidences and pattern of poisoning in rural areas. The present study carried out to evaluate the type of poisoning deaths among the unnatural death at DMC morgue for autopsy over a period of one year from January 2023 to December 2023. **Material and method:** This retrospective study was conducted in the year January 2023 to December 2023 in the morgue of Forensic Medicine and Toxicology department of Dhaka Medical College. Out of total 2156 medico legal autopsies, 387 (17.93%) were poisoning deaths during the study period. **Result:** Specific poisons were identified in 301(77.69%) cases. Maximum number of poisoning deaths cases reported was due to Organo Phosphorous compound (65.36%). Peak incidence (35.81%) was observed in the age group 21-30 years, with male female ratio of 1.12: 1. Agricultural workers have been found to be a major (31.86%) risk group by occupation. Most of the victims were from rural areas (62.37%). Married outnumbered the unmarried victims 230(59.47%) and belonged to lower socioeconomic status 202 (52.17%); 224 Cases (57.89%) did not complete their primary education. Intentional poisoning deaths (90.93%) were more. **Conclusion:** To reduce poisoning cases proper emphasis should be given for safe use of pesticides and awareness should be created among the population about poisonous compounds.

**Key words:** Death, Poisoning, Autopsy.

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#### Introduction

Every unnatural death represents a tragic waste of precious human life and resources. Death as a result poisoning is no exception. Death due to poisoning has been known since time immemorial. Poisoning is a major Public health related problem all over the world, although its type and morbidity and mortality vary from country to country. Poisoning is a leading cause of morbidity and mortality in our Country. According to legal system of our country all poisoning deaths cases are recorded as unnatural death and a medico legal autopsy was carried out routinely.<sup>1</sup> Poison, a substance liquid, solid or gases that causes damage to living tissue and has an injurious or deleterious effects on the body, whether it is ingested, inhaled or absorbed or injected through the skin. Poisoning usually involves four main elements; the poison, the poisoned organism, injury to the cells, and symptoms and signs or death. These four elements

represent the cause, subject, effect and consequences of poisoning. To initiate the poisoning the organism may be liberated or exposed to the toxic chemicals. When a toxic level of the chemical is accumulated in the tissue or organ, which cause injury to the cells hence disrupts their normal structures and functions. Symptoms and toxic signs then develop and if the toxicity is severe which resultant, death may result.

Poisoning cases (Organophosphorus compound) can also occur accidentally and rarely as homicidal purpose other than suicidal. Accidental poisoning occurs in manufacturers, users, children of users, packers, sprayers and due to contamination of food grains mixed with insecticides preserved for seedling purposes. Poisoning also occurs from fruits and vegetables.

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**Materials and Methods:**

This is a retrospective study. A total of 2156 medico legal deaths were autopsied in DMC mortuary during the period from January 2023--- December 2023. Out of which 387(17.93%) cases were suspected poisoning death were the subjects of our study

Data were collected from hospital records, relatives of Victims, Police inquest reports and PM reports preserved in the Forensic Medicine and Toxicology department of DMC. Types of poisons consumed were verified from the reports furnished by chemical Examiner of Chemical analysis Laboratory of CID Mahakali, Dhaka.

**Results:**

A total of 2156 cases of unnatural deaths were autopsied in DMC Morgue, number of deaths by poisoning deaths were 387 (17.93%), of which Specific poisons were detected in 301 (77.69%) cases. Among the total detected poisoning cases OPC was the commonest agent 253 (65.36%) (Table-1) followed by barbiturate 87(22.47%)

Among the poisoning deaths 204(52.97%) out of 387 were male and 182(47.13%) were females with male female ratio being 1.12:1 (fig-2)

Highest incidence of poisoning was found in 21-30 years age group 139 (35.81%) (Fig-1) followed by 15-20 age group of 94 (24.18%).

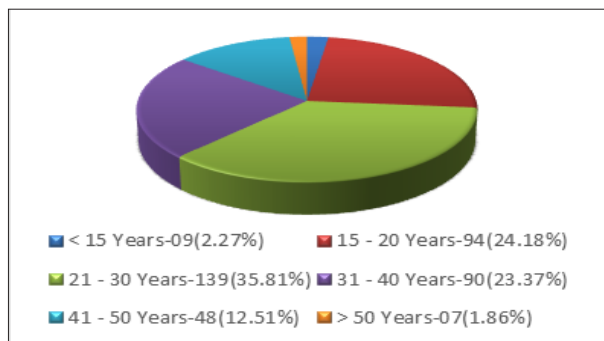
The study shows that majority of victims were belong to agricultural workers/ farmers 123(31.86%) (Fig-3) followed by housewives 82(21.20%).

Among the study subjects, 224(57.89%) were illiterate (Table-2)

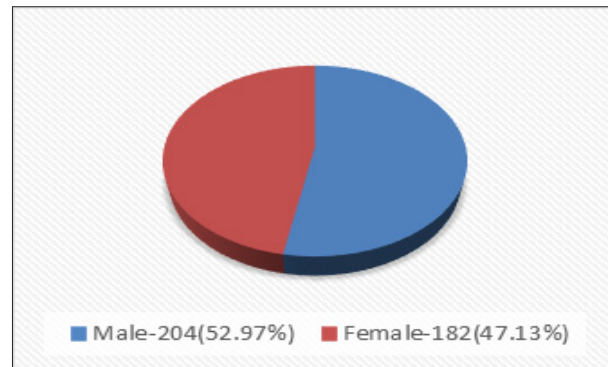
Table 3 shows that most of poisoning victims 241(62.37%) were rural areas,

It was observed that 230(59.47%) were married (Table-4) and 202(52.17%) were from lower class family (Table -5).

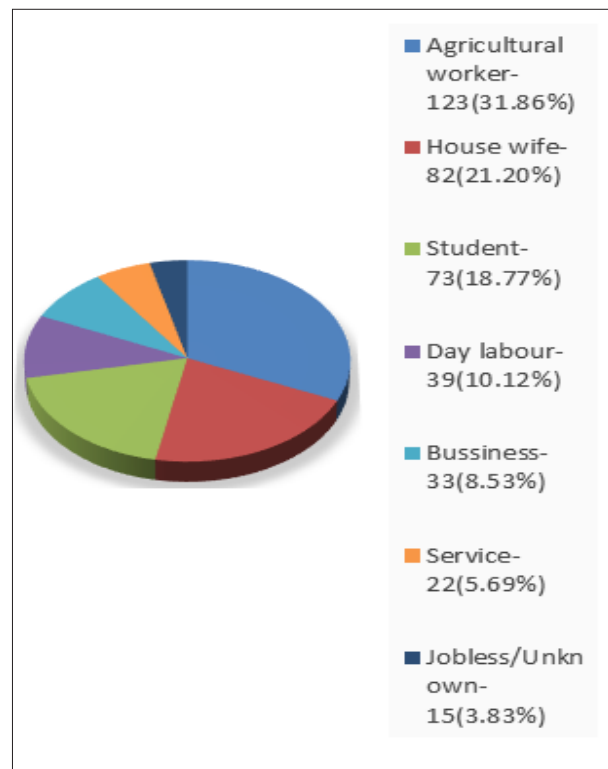
Suicidal death was the most common manner of poisoning death accounting for 462(90-94%) (Table-6) followed by accidental death were 46(9.06%)



**Fig-1: Age distribution of poisoning victims (n=387)**



**Fig-2: Sex distribution of poisoning victims (n=387)**



**Fig-3: Distribution of poisoning victims by profession (n=387)**

**Table 1: Types of detected poisonous compounds (n=387)**

Name of poisonous compound	No. of victim	Percentage %
Organo Phosphorous compound(OPC)	253	65.36%
Benzodiazepine	87	22.47%
Methyl Alcohol(spirit)	20	5.23%
Zinc Phosphide(rat killer)	09	2.41%
Organofluorine	06	1.56%
Others – Savlon, Harpic, Sulphuric acid, Saipermethrin,	12	2.97%

**Table -2: Educational status of poisoning victims (n=387)**

Educational status	No. of victim	Percentage
Illiterate	224	57.89%
Below SSC	65	16.89%
SSC	51	13.23%
HSC	40	10.23%
Graduation & above	07	1.76%
<b>Total</b>	<b>387</b>	<b>100%</b>

**Table-3: Area distribution of poisoning victims & Ratio (n=387)**

Area	No. of victim	Percentage	Ratio
Rural	241	62.37%	<b>Urban : Rural</b>
Urban	146	37.63%	
<b>Total</b>	<b>387</b>	<b>100%</b>	<b>1 : 1.65</b>

**Table-4: Marital status of poisoning victims & Ratio (n=387)**

Marital status	No. of victim	Percentage	Ratio
Married	230	59.47%	<b>Unmarried: Married</b>
Unmarried	157	40.53%	
<b>Total</b>	<b>387</b>	<b>100%</b>	<b>1 : 1.46</b>

**Table-5: Socioeconomic status of poisoning victims (n=387)**

Socioeconomic status	No. of victim	Percentage
Lower class	202	52.17%
Middle class	61	15.87%
Upper class	124	31.96%
<b>Total</b>	<b>387</b>	<b>100%</b>

Upper Class includes income>12000tk/month

Middle Class includes income 6000-12000tk/ month

Lower Class includes income<6000tk / month

**Table-6: Manner distribution of poisoning victims (n=387)**

Manner	No. of victim	Percentage
Suicidal	352	90.93%
Homicidal	00	00%
Accidental	35	9.07%
<b>Total</b>	<b>387</b>	<b>100%</b>

**Discussion**

Committing Suicide by poisonous substances is considered the best methods compared to hanging or other methods. The mortality and morbidity of poisoning depends on nature and amount (fatal dose) of poison

consumed, standard of treatment facilities available, time interval between poison intake and appearance of symptoms and provision of medical support as a whole.

Incidence of poisoning, intentional or accidental is on the rise nowadays despite the best efforts of legislative, punitive, social and educational machinery to combat this menace. The popular notion that poisoning causes easy availability, easy administration, minimal suffering and painless prior to death and that it is less grave a sin that causing death by violence has only helped in rapid rise of incidence of poisoning cases.<sup>2</sup>

A total number of 2156 of medico legal deaths cases were autopsied in the department of Forensic Medicine and Toxicology of Dhaka medical College during this study period and the number of deaths by poisoning were 387 (17.93%).

Among the detected poisoning cases specific poisons were identified in 301(77.69%) cases. OPC was the commonest agent 253(65.36%) followed by barbiturates 87(22.47%). Availability of OPC is very easy and is used mostly in farming activity in paddy field and agro industry. As because Bangladesh being an agriculture nation and over 87% people actively or passively related to agri based economy. So handling of these agents (Organophosphorus compound) is a routine practice for farmers and their family. Household and agricultural agents were, associated with the most poisoning due to easy availability of these agents to the nearby market, in addition unsafe and unprotective application, illiteracy, ignorance about the danger of such agents, inadequate knowledge to support their household use and lack of protective equipments are also responsible. Similar observation was found in a study performed in Bangladesh showed that OPC poisoning was the commonest one in rural area.<sup>3</sup>

The highest Incidence of poisoning death noticed in the age group 21-30 years 139(35.81%), followed by age group of 15-20 years 94 (24.18%). Domestic, educational and employment related stress, poverty, frustration due to inability to cope with highly competitive stressful society, failure in exams or love affairs, lack of job scolding by parents are important reasons. Similar pattern to this has been observed in the study of other authors.<sup>4</sup>

A wide range of both genders was found exposed and victims to poisoning with male predominance male 204(52.97%) and female 182(47.13%) with male female ratio being 1.12:1 was profoundly noticed in our study this can be explained on the basis that male are exposed more life stress, strain and occupational hazards in comparison to females. Similar findings were also observed studies of other authors<sup>4</sup> as well.<sup>5-7</sup>

Married people 230(59.47%) outnumbered the ones unmarried 157(40.53). Marital disharmony, poverty, addiction probably causing stress and leading to extreme

decision like poisoning. The amount of life stress, strain, family burden carried by married people on their day to day life is more than unmarried people which make them more vulnerable. Similar observation also found in other studies.<sup>10, 11</sup>

It was observed in our study that most 241 (62.37%) of the victims of death by poisoning were from rural areas compared to urban part 146(37.63%). It may be due to rural areas are remotely placed and having limited access to hospital with limited medical facilities. Limited sources, more farming activities, rapid development in agricultural sector, easily availability of highly toxic insecticides, large family size are also responsible of such incidence of poisoning. Similar type of findings was noted by other authors.<sup>8</sup>

Organo phosphorus compound (insecticide) was used in majority of cases in various other studies.<sup>9, 12</sup>

People of lower socio-economic class 202(52.17%) were more vulnerable for high incidence of poisoning in comparison to middleclass 61(15.8%) and upper class 124(31.96%) which may be due to the fact that they were under continuous financial, addiction, frustration and other complex problems related to their employment during life. The similar type of findings were observed by other authors.<sup>6, 8, 13</sup>

## Conclusion

The study reveals that Poisoning is the commonest and easiest method of committing suicide in rural area. The data also revealed that Organo phosphorous compound (Insecticide) was most commonly used poison in our country. The reason may be agriculture is the main occupation in our country (in rural area) with its easily availability, illiteracy and low socio-economic status. The young age people commonly affected due to expanding due to poverty, stress in life, unemployment, changing life styles and financial hard ship. This can be prevented by strict rules and regulation on storage, sale, distribution and use of such highly toxic substances. In paddy field accidental poisoning can be prevented by wearing of protective cloths. High rates of intentional poisoning death can be decreased by generating awareness among people in rural areas about the harmful effects of agro-chemicals. Establishing counseling centre in each hospital is one step forward and by tackling the problems of risk group sympathetically.

We are highly suggested that the concerned authority should regulate the import, manufacture, sale, transport, distribution and use of insecticides in the field and pesticides with a view to prevent risk and damage to human beings. Poison information centers, introducing separate toxicological units in the hospitals for the purpose of treatment as well as assessing the patient and collecting data for promoting prevention. Upgrading and modernization of the peripheral health centers to manage

cases of poisoning effectively in emergency and thereby prevent poisoning by deaths.

## References

1. Muhammad NI, Nasimul I Retrospective study of 273 deaths due to poisoning at Sir Salimullah Medical College from 1988 to 1997. *LegMed* 2003;S : S129-31
2. Sharma BR, Harish D, Sharma V. The Epidemiology of Poisoning An Indian View Point, *JFMT* 2002;19(2)5-11
3. Azhar MA, Mahmoodv TAK, Rafiqueuddin AKM. Pattern of Poisoning and its Mortality in Rajshahi Medical College Hospital, *J Medical Teachers Federation* 1996(2):56
4. Dhatarwal SK, Dalal SS. Profile of Death due to Poisoning in Rohtak Haryana in the year 1995, *J.ForMed Toxicol*, 1995; 15;51
5. Kanchan. T, Menzes.RG, Social Poisoning in Southern India. Gender differences, *J.Forensic. Leg Med* 15(1)(2008)pp7-14
6. Gargi J, TejPal HR, Chanana A, Rai G, Chaudhary R. A retroscopic autopsy study of Poisoning in northern region of Punjab. *Journal of Punjab Academic Forensic and Medical Toxicology* 2008; 8(2)17-9
7. .Kanchan T, Menzes RG, Kumar TS. Toxicoeidemiology of fatal Poisoning in southern India. *Journal of Forensic and legal Medicine* 2010; 17:344-7 <https://doi.org/10.1016/j.jflm.2010.05.006> Pmd :20650426.
8. Singh S, wig N, Chaudary D, Sood NK, Sharma BK. Changing Pattern of Acute poisoning in adult; *J.Assoc Physic India*, 1947; 45:194-197
9. Mugdlimath A, Bangali MA, Hibare SR, Ingala DI, Gupta N, Bhuyar C. Study of socio-demographic people of poisoning cases at Shri BM Patil Medical College Hospital, *Indian Journal of Basic and applied Medical research*. 2015 March; 4(2); 426-482
10. BenSal N, Vniyal N, Kashayap PV, Khan S. A profile of poisoning in Uttarkhand. *Tras world Med Jr*, 2013; 1(4) 128-130.12
11. Zaheer MS, Aslam H, Gupta V, Khan S. A profile of poisoning case at a North Indian tertiary care hospital; *HLth. Pop. Pers. Issuval* 32.(4) 176- 2009
12. Srinivas S, Karya ST, Madhumati R, Dudhawala A profile of poisoning in a tertiary care hospital. *U. BMS* 2013; 4(3)
13. Agarwal R, Barthwal SP, Nigam DK, Saxsena S, Shukla SK, Shukla N, Shukla RP. Changing pattern of acute poisoning in eastern UP Hospital based study. *J Assoc Physic India*. 1995;