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A Medico legal Inquiry into the Prevalence of Poisoning cases in a Rural Area of Bangladesh

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ABSTRACT: ***Background:*** Poisoning is a prevalent global public health issue. All around the world, acute poisoning from different substances is prevalent. The sooner gastrointestinal decontamination, specific antidotes, and first resuscitations are performed, the better the result. A comprehensive analysis of the risk variables contributes to a reduction in both incidence and mortality. ***Objective:*** The purpose of this study was to determine the prevalence and trends of poisoning in Manikganj, as well as the various facets of poisoning, demographic trends, social factors, and other relevant perimeters, as well as strategies to stop the loss of valuable life due to poisoning. ***Methodology:*** This retrospective cross-sectional study was conducted at the district hospital in Manikganj, Bangladesh, between January 2019 and December 2020. ***Results:*** There were 381 medico legal post mortems performed during this study period. Of them, 111 cases were due to poisoning. Among the poisoning cases discovered, OPC was the most common agent 83, (74.77%), followed by snake bite 12, (10.81%), diazepam 07(6.30%), and methyl alcohol 05, (4.50%). Majorities were male 61, (54.95%) and maximum deaths were observed between ages 21-30 years 39, (35.13%). People of different occupations were involved in poisoning maximum of them were farmers 39, (35.13%) followed by housewives 29, (26.12%). ***Conclusion:*** Appropriate attention should be paid to the safe use of pesticides and raise public awareness of toxic substances in order to lower the number of poisoning incidents. In this nation, a thorough investigation of poisoning-related deaths is necessary.

Keywords: Medico Legal, Poisoning, Rural Bangladesh.

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INTRODUCTION

A terrible waste of valuable human life is represented by every unnatural death, whether it is suicide, an accident, or a murder. A frequent cause of unnatural death is poisoning. A poison is any material that damages the body and puts life in danger when consumed, inhaled, or come into contact with it.[1] According to the Bangladesh Health Authority's annual report, poisoning is still one of the country's top 10 health issues.[2] A number of variables, including geography, accessibility, poison availability, socioeconomic circumstances, and cultural and religious influences, can cause the pattern of poisoning to fluctuate from time to time, from nation to nation, and from area to region.[1] Bangladesh is a developing nation that relies heavily on agriculture. The agriculture sector is the primary source of income for this nation's rural inhabitants. Pesticides are increasingly often utilized in contemporary farming methods, and because they are so readily available, the number of pesticide-related suicides has also

increased. It is a worldwide public health issue, not only in developing nations.[3] According to estimates from the World Health Organization (WHO), poisoning causes over 250,000 deaths globally each year, with pesticides alone responsible for 150,000 of those deaths.[4] Ingestion of pesticides also contributes to suicide deaths in developed countries.[5, 6] In rare instances, poisoning can be done for homicidal purposes, although it can also happen accidently. Accidental poisoning happens to producers, consumers, users' children, packers, sprayers, and when food grains contaminated with pesticides kept for seedlings are used. Another source of poisoning is fruits and vegetables.[7] Insecticide-induced homicidal poisoning is typically uncommon due to the odor of the diluents, which are aromax, as well as the concerning symptoms that show up early. Therefore, the purpose of this study was to determine the epidemiological profile and current trends of acute poisoning in Bangladesh's rural areas.

METHODOLOGY

This retrospective cross-sectional study was carried out in January 2019 to December 2020 among poisoning victims at the district hospital Manikganj, Morgue. During that time, 381 medico legal autopsies were performed, 111 of which were poisoning-related. The inquest report that accompanied the deceased bodies, information from the victim's attendants, and copies of post mortem reports kept in the mortuary all contained various identifying information on the study participants. The Chemical Examiner's report was used to specifically identify the poisons. From an ethical perspective, the required agreement of the victims' family and the physicians who conducted the autopsies has been obtained. The ethical clearance was approved by proper authority. Later, all of the data was examined and presented with appropriate tables. Statistical analysis was performed by window-based computer software devised with Statistical packages for Social Sciences with 95% confidence limit.

RESULTS

During this study period, 381 medico legal post mortems were conducted. Poisoning was the cause of 111 of these instances. OPC was the most prevalent agent 83 (74.77%) among the poisoning cases that were found followed by snake bite 12 (10.81%), diazepam 07 (6.30%), methyl alcohol 05 (4.50%). There were 61 males (54.95%) and 50 females (45.05%) in the study sample. The third decade had the highest number of instances 39(35.13%), followed by the fourth decade 27 (24.32%). 39 (35.13%) farmers or agricultural workers made up the majority of the victims (36%), followed by housewives 29 (26.12%), unemployed 28 (25.23%), students 09 (8.12%).

Table 01: Type of Poisoning with Percentage (n=111)

Type of poisoning	Number of victims	Percentage
Organ phosphorus compounds	83	74.77
Snake bite	12	10.81
Diazepam	07	6.30
Methyl Alcohol	05	4.50
Zink phosphate (Rat killer)	02	1.81
Savlon, harpic	02	1.81
Total	**111**	**100**

Table 02: Sex wise Distribution of Poisoning Victims (n=111)

Sex	Frequency	Percentage
Male	61	54.95
Female	50	45.05
Total	**111**	**100**

Table 03: Age wise Distribution of Poisoning Victims (n=111)

Age group (in years)	Frequency	Percentage
0-10	05	4.5
11-20	18	16.22

21-30	39	35.13
31-40	27	24.32
41-50	15	13.51
>50	07	6.32
Total	**111**	**100**

Table 04: Occupation wise Distribution of Poisoning Victims (n=111)

Occupation	Frequency	Percentage
Farmers	39	35.13
housewives	29	26.12
unemployed	28	25.23
Students	09	8.12
Others	06	5.40
Total	**111**	**100**

DISCUSSION

Acute poisoning is a serious medical situation. Depending on socioeconomic and cultural factors, the trends in poisoning might differ globally and even within a country.[1] Poisoning deaths are frequently accidental or suicidal in cause. Organ phosphorus compounds are the most often utilized substances for suicidal purposes. Chemicals like acetic acid, parquet, and parathion are used to make rubber in South-East Asia, while barbiturate, diazepam, and opium are utilized for self-destruction. Dichlorvos 76% EC is also utilized as an injectable suicide agent, according to an Indian study.[8] Some common observations made during the post mortem examination of poisoning instances included the research subjects' cyanosis in the nose, lip, and finger, blood-stained froth in the mouth and nostrils, and the peculiar smell of OPC in the stomach contents. The internal organs were all congested. A stomach sub mucosal petechial hemorrhage was discovered. Sub pleural petechial hemorrhage and excessive edema were also observed.[9] According to this study OPC was the most common cause of poisoning and the leading cause of mortality 83 (74.77%). The results were remarkably similar compared to the baseline survey conducted nationwide in 2007 and a recent pilot study conducted in various hospital categories in Bangladesh (28.5%).[10] Followed by snake bite 10.81%, Diazepam 6.30%, methyl alcohol 4.5%, zink phosphate 1.81%, savlon, harpic 1,81%. Similar study had been conducted by Ahmad *et al*. [8] Rural farmers with low socioeconomic level and the jobless make up the majority of the victims in our study. The fact that agriculture is the most common occupation in our nation may be to blame. Since individuals typically gather in their houses after work to talk about their issues and become so irritated that they resort to drastic measures, the easy access to pesticides and their consumption, which occurs primarily in the evening, may be explained.

Because to a number of circumstances, such as the high frequency of Russell's vipers, the scarcity of widely available and efficient antivenom, and the challenges associated with prompt access to medical care, snakebite fatalities are extremely prevalent in Bangladesh's Manikganj district. Vipers are more common in the area due to increased rodent populations and enhanced farming, and snakes may also expand because of the district's closeness to the Padma River.[11] The third most prevalent form of acute poisoning was found to be sedative poisoning (6.30%). The medications utilized for sedative toxicity included benzodiazepines, bromazepam, clonazepam, and antidepressants. This was caused by the medications' easy accessibility and the fact that they could be brought without a valid prescription. For recreational and addictive purposes, illiterate individuals also use inexpensive, domestically produced alcohol (spirit, methyl alcohol), which can lead to poisoning. Spirit and methyl alcohol overdoses result in these individuals' unintentional deaths. Poisons those are readily accessible in the home, such as harpic, savlon, rat poison, and mosquito coils, can potentially cause poisoning. Out of the 111 victims in our study, 61 (54.95%) were men and 50 (45.05%) were women. Here the male show dominances over females. Similar study had been conducted by Ahmad *et al*., and Karki *et al*., showing male majorities.[8, 12] Men have greater access to toxic materials than women because they are typically the family's primary breadwinners. Nonetheless, the majority of research

carried out in various parts of Bangladesh revealed that men were more frequently impacted than women. A female-dominated study with a female: male ratio of 1.2:1 was carried out in Shenyang, China, which is not the same as this study.[13]

The current study's higher occurrence in the third decade (35.13%) may be the result of an individual experiencing more stress as a result of being exposed to many social, economic, domestic, and professional pressures. Immature thinking, academic competition, early marriages, and an inability to handle post-marriage stressors, particularly in rural areas, can all contribute to strain in the second decade (24.32%). Our study is similar to many others study.[8, 13, 14] By occupation farmers made up the largest percentage of occupations (35.13%) followed by housewives (26.12%), unemployed (25.23%), and students (8.12%). These results demonstrated parallels with the other study.[8] Bangladesh is an agriculture-based country, so maximum populations in the rural area earned their livelihood through farming. Most of the farmers have huge lack of knowledge about the proper use of pesticides, that's lead to accidental poisoning. Our nation's farmers apply pesticides without understanding the negative consequences. They bring the pesticides at home from work and leave them there unguarded. So, due to easily accessible, lack of financial support, emotional vulnerability, domestic violence, and more stressful relationships may be the causes of the high percentage of poisoning among housewives. Unemployment is the all the leading cause of frustration, depression and death. This study has certain limitations because it is record-based and retrospective, and it has overlooked important information like the time it took to go to the hospital and a comprehensive psychiatric history. Since this study was limited to a certain region, it might not accurately represent Bangladesh's current circumstances.

CONCLUSION

This study highlighted the regarding type of poisoning organ phosphorus compound poisoning was very common. Among young people and farmers, poisoning incidents were reported, with a preponderance of men from lower socioeconomic groups. Due to their affordability and ease of availability, housewives and students were also the most frequent victims. In this nation, agrochemical compound poisoning is a significant issue. The safe application of pesticides needs to be properly emphasized. It is necessary to raise public awareness about toxic substances. In rural areas, community education ought to be implemented. A thorough investigation of deaths brought on by the poisoning of organ phosphorus substances must be conducted in our nation. To close the gaps in the current legislation pertaining to pesticides, their manufacture, distribution, sale, storage, and use should be addressed. Reductions in incidents are anticipated as a result of public awareness of the seriousness of poisonings.

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