Original Article

Pattern of Agricultural Poisoning in District Level Hospital

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Abstract

Background: *In Bangladesh, acute poisoning is a serious public health issue. Suicide by this manner is rather prevalent. Every area needs a detailed picture of clinical presentation, the most widely utilized hazardous substances, background circumstances, and the result of poisoned patients. The study's goal is to look at the occurrence and outcomes of acute poisoning episodes in Pabna Upazila, Bangladesh.*

Objective: *To find out the chemical types of agricultural poison and out of the acute poisoning cases by agricultural poisons.*

Materials and Methods: *This is a prospective study, carried out in Pabna Sadar Hospital between April 2019 to December 2019.*

Results*: A total of 120 patients were studied in this study. There were 23 males and 97 females. The average age group for acute poisoning was 15-25 years. The major toxic agent that caused the acute poisoning death was OPC. The average hospital stay was 2-3 days, and 82% of patients were fully recovered and discharged.*

Conclusion: *Acute poisoning cases were more in young age group, female; most of the patient had history of ingestion of OPC and more than two-third cases recovered.*

Key words: *Acute Poisoning, Toxic Agents, Chemical Pesticides, Pabna, Agricultural Poison.*

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Introduction

One of the most prevalent reasons for emergency room visits is acute poisoning. Acute poisoning occurs when a dangerous chemical agent is intentionally, accidentally, or homicidally ingested into the body.[1] Poisoning has been recognized as a cause of death from the beginning of time. Poisoning is a huge concern all around the globe since it is a non-violent weapon.[2] Rather of dying by hanging or self-harm, a human swallows a poisonous drug and dies peacefully. Poisoning by chemical agents has become more common as a result of accidental, occupational, or purposeful exposure.[3] Poisoning kills an estimated half a million people per year, mostly due to pesticide exposure.[4] Although developing nations account for just 15% of global pesticide usage, the World Health Organization (WHO) estimates that they account for nearly 50% of pesticide poisonings.[5] Due to a lack of epidemiological data from the area, the true scope of the issue remains unknown. Hospital-based research and public health monitoring data, on the other hand, clearly show an increase in the number of poisonings caused by drugs and chemicals (especially pesticides).[1,2,5]

The severity of morbidity and death in poisoning cases varies by poisoning agent and country. Insecticides, herbicides, fungicides, rodenticides, and disinfectants are among the many chemicals found in pesticides.[6] As a result, more than 1,000 active chemicals have been combined into about 35,000 pesticide formulations for agricultural usage. OPCs are the most widely used of them, and their usage is steadily expanding in response to rising morbidity and death rates, particularly in poor nations.[7] Self-poisoning with OPC pesticides is thought to kill some 200,000 individuals per year, predominantly in the Asia-Pacific area, with a fatality rate ranging from 10% to 20%. [8]

Poisoning care, as well as diagnosis and treatment facilities, are scarce in most impoverished nations. Planning and implementing national poison regulations has also been problematic owing to a paucity of epidemiologic data on poisonings and the complexity of the chemicals in diverse chemical goods. As a result, more comprehensive national data on chemical and pharmaceutical poisonings is required. In poor and middle-income nations, acute poisoning is a serious public-health issue. Toxic agents employed differ per nation, based on the ease with

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which chemicals may be obtained, the socioeconomic status of the population, and their educational background. Acute poisoning is a frequent health concern in Bangladesh, with over 2000 people dying each year.[5] Poisoning is a prevalent way for people to commit suicide, according to studies, particularly in impoverished nations.[3] More than half of all poisoning cases admitted to Bangladeshi hospitals are caused by self-poisoning .[3] Furthermore, a significant number of fatalities in Bangladesh as a result of poisoning have been linked to suicide attempts.[6]

Agriculture remains a labor-intensive industry in our nation. At different phases of pesticide development, production, and spraying, agricultural workers are exposed to a variety of toxins. When pesticides are used, they may cause acute, sub-acute, or chronic health problems. Toxicity is most often caused by either intentional self-harm or unintentional exposure while work. The bulk of fatalities, however, are caused by purposeful self-poisoning, which is a tough health strategy to manage among health providers, particularly in Asia. In rural Asia, poisoning accounts for over 60% of all self-harm. Organophosphate chemicals are projected to be inhaled by 3,050,000 persons every year all over the globe. Every year, 300,000 people are reported to be killed. 220,000 people have died as a result of ingesting organophosphate chemicals (OPCs) .[9] A large portion of this burden falls on underdeveloped nations, where hospitalization due to deadly pesticide poisoning accounts for more than 80% of cases.[7] Acute poisoning is a prevalent occurrence in emergency rooms. As a result, every area must have a comprehensive picture of clinical presentation; the most regularly employed hazardous chemicals, background circumstances, and the fate of poisoned patients. There are few studies which focused chemical types of agricultural poison and their outcomes. Therefore, this study was was carried out to see the chemical types of agricultural poison and their outcome in Pabna Sadar (district level) hospital.

Materials and Methods

This is a prospective study, carried out in Pabna Sadar Hospital between April 2019 to December 2019. Purposive sampling method was used to collect the sample. Patients aged 12 years and above were included in this study. Patients who have tablet or unknown poison are not included.

Results

Table 1 is showing that total number of patients in this series was 120. Age varied from 12 to 60 years. The average age was 25 years. Maximum number of patients falls into 2nd decade.

Table I: Age group of the Patients

Age in years	Number
0 - 14	6
15 - 25	70
26 - 35	33
36 - 45	8
45+	3

Figure 1 shows that out of 120 patients, 97 were female and only 23 were male. And the percentage of the sex distribution was female at 80.8% and male at 19.2 %.

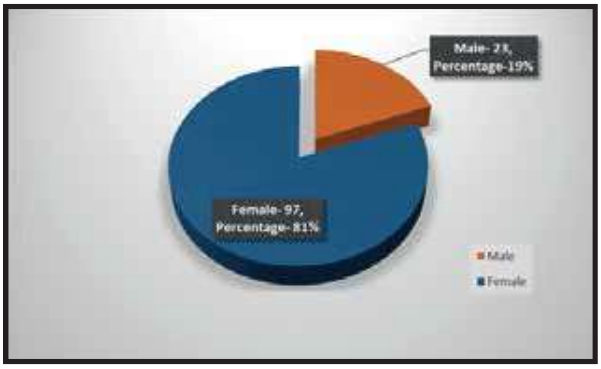

Figure 1: Sex of the patients.

Toxic Agents:
OPCs were the most commonly used toxic agents 41 (34.16%), second largest toxic agents were aluminum phosphide 11.7 %, neurotoxin and zinc sulphate were 9.2% and 7.5% respectively. The other agents were fungicidal, herbicide, paraqual. Insecticide, pesticide, paraffin and nitric acid were also found in this series (Table II).

Table II: Toxic agents and Number

Toxic Agents	Number	Percent
OPC	41	34.16
Alluminium Phosphide	15	12.5
Cypermethrin (Neurotoxin)	13	10.83
Zinc phosphide	11	9.16
Paraquate	7	5.83
Pendimethalin (herbicide)	05	4.16
Oxadiaxone	04	3.33
Carbofuran	03	2.5
Quizalofop -p-ethyl	02	1.66
Lufenuron	01	0.83
fenitrothion	04	3.33
Imidacloprid	02	1.66
Emamectin benzoyate	01	0.83
Paraffin	3	2.5
Propiconazole	02	1.66
Tebuconazole	01	0.83
Benzimidazole	01	0.83
Cymoxanil Mancozeb	02	1.66
Difenoconazole	01	0.83
Hexaconazole	01	0.83

In this study 82.5% of the patients were recovered, 4.16% patients died and 12.5% were referred to higher center, among them 3 patients were referred due to development of AKI, remaining patients were referred according to the wishes of the patients guardians (Table III).

Table III: Outcome of the Patients

Outcome	Frequency	Percent
Recovered	99	82.5
Died	05	4.16
Ref of RMCH	13	10.8
Ref of DMCH	2	1.66
Total	120	100

Duration of hospital stay was 2 to 3 days in 55% of the patients and 14.2% patients had to stay more than 7 days. (Table IV shows that the mean duration of the hospital stay).

Table IV: Duration of Hospital Stay

Duration of Stay	Frequency	Percent
2 to 3 days	66	55
4 to 5 days	19	15.8
6 to 7 days	18	15
8 to 10 days	2	1.7
11 to15 days	15	12.5
Total	120	100

Discussion

Acute poisoning is an important medical emergency. The nature of poison used varies in different parts of the world and may vary even in different parts of the same country depending on the socioeconomic factors and cultural diversity. Management of these critically ill patients will greatly improve if the common causes of poisoning are properly defined.[10] In our study female was higher than male, Males dominated in a study done in tertiary care hospital in Karnataka, India where male to female[11] ratio was 3:1. However, some other studies have shown that males are marginally higher compared to females [12,13,14] In this study, age of the majority of the poisoning cases was between 15-25 years (58.33%). In another study majority (61.7%) was between 12- and 29-year age group.[2] Similar findings were observed in other studies.[11,12,15]

Agriculture is the foundation of Bangladesh's economy. Agriculture is directly or indirectly responsible for 80% of the population. In Bangladesh, pesticides are commonly utilized to control insect vectors, with OPCs being one of the most widely used. OPC poisoning is thus fairly prevalent.[2,7] The most widely employed poisons, according to this research, were OPCs. This supports prior research that indicated OPC poisoning is a widespread means of suicide in Southeast Asia.[1,5] In other regions of the globe, however, pesticide poisoning is a widespread health issue. Over half of self-poisoned patients in Brazil employed pesticides, according to one research.[16] Pesticide use is the most prevalent means of suicide worldwide, according to the World Health Organization (WHO).[17]

In this study OPC was the most commonly used poison (34.16%) followed by alluminium phosphide (12.5%) and cypermethrin 10.8%. In another study[18] OPC were used in 82.45% of the acute poisoning cases. Ratindra et al found that among the acute poisoning cases 73.5% were OPC in Rangpur Medical college hospital.[19] Because most pharmaceuticals are inexpensive and readily accessible in Bangladeshi market places. This study's lower death rate might be attributed to increased public knowledge, better facilities, faster patient transfer to hospitals and improvement of management facilities in hospital.

Limitations of the study

Patients under the age of 12 were excluded from this research. The research does not look at the patients' occupations or marital status. The result and length of stay of patients at the territorial medical hospital are the major subject of this investigation. Furthermore, in other instances, the responsible toxin was reported based on the patient's narrative rather than scientific results. Because this was a prospective research, it's possible that the stated reasons of suicide were skewed by erroneous documentation. Furthermore, those that were questioned may have given answers based on their own interests.

Conclusion

Acute poisoning cases were more in young age group, female; most of the patient had history of ingestion of OPC and more than two-third cases recovered.

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