Original Article

Rate and Pattern of Death due to Poisoning in Sir Salimullah Medical College during COVID-19 Pandemic

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Abstract

Background: The COVID-19 pandemic caused global disruptions, significantly impacting people's daily lives, social habits, and overall physical and mental health. These stressful changes are known to influence patterns of self-harm and accidental injury, creating a unique context for studying toxicological fatalities.

Objective: The study aimed to evaluate the patterns and rates of poisoning-related deaths autopsied at a Sir Salimullah Medical College hospital in Dhaka, Bangladesh, during the COVID-19 pandemic period.

Materials and Methods: A two-year retrospective study of poisoned deaths was conducted by the Department of Forensic Medicine & Toxicology, reviewing post-mortem records and police inquest reports from January 2020 to December 2021. The goal was to profile the deaths and compare findings with pre-pandemic studies.

Result: A total of 272 suspected poisoning cases were autopsied. Organophosphorus Compounds (OPC) were the most prevalent agent (59.5%), followed by alcohol/rectified spirit (10%). The majority of victims were men (64.3%), but women represented a significant portion (35.7%). The highest rate of poisoning was found in the 21–30 year age group (31.5%). Students and housewives were the most affected occupational groups. Family discord was the leading motive, accounting for 22.3% of cases.

Conclusion: The COVID-19 epidemic altered the pattern of poisoning cases, with the lockdown situation contributing to a rise in suicides. Quick action is imperative from healthcare professionals, legislators, and mental health support providers, especially targeting women and those in vulnerable age groups, to mitigate these risks.

Keywords: COVID-19; Poison; Suicide; Poisoning Pattern; Autopsy; Pandemic.

Introduction

Poison is a substance solid, liquid or gaseous which introduced into the living body or brought into contact with any part thereof, will produce ill health, disease, or death by its constitutional effects, local effects or both. [1]

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Received Date : 14 May, 2025
Accepted Date : 10 June, 2025

A serious global public health issue, poisoning has a high rate of morbidity and mortality across all age and sex categories. Because of socioeconomic considerations, cultural diversity, the growth of agricultural activities, and the use of agrochemicals, this is more prevalent in low- and middle-income nations.[2] Generally children are more vulnerable to accidental poisoning, whereas young adults are more committed to suicidal poisoning attempts.[3] All unnatural deaths-whether suicide, accident, or homicide-represent a terrible loss of valuable resources and human life.[4] Ingestion of pesticides also contributes to suicide deaths in developed nations.[5,6] Bangladesh is one of South East Asia's most populous emerging nations with a strong agricultural economy. Because pesticides and insecticides are widely used, easily accessible, and inexpensive in rural areas, the number of acute

poisoning-related deaths and hospital admissions in our nation is rising. According to a few studies, sleeping pills, or sedative drugs, rank second to pesticides as the most frequently utilized chemical agent for acute poisoning in our nation. Additionally, sedative medications, copper sulphate, kerosene, insecticides, pesticides, Herpic (toilet cleaner), etc. are frequently employed poisons for acute poisoning in our nation.[7,8] Though it may vary in different parts of the world even may be in different regional variations in same country. Hence, this study was undertaken to evaluate the age, sex, common poison used and pattern of poisoning found in this rural area.

Materials and Methods

Between January 2020 and December 2021, a retrospective study was carried out that included 272 poisoning cases that were autopsied in the mortuary of Sir Salimullah Medical College Hospital in Dhaka. The information is gathered from post-mortem and inquest reports. The resulting data was evaluated, and the study was conducted in terms of the distribution of age and sex, the cause of death, post-mortem results, and ligature findings. The police inquest report included information regarding the crime scene. SPSS was used for analysis once the gathered data was collated on a master chart. Responses were automatically compiled by SPSS analyzed using descriptive statistical methods. Data were presented in the form of frequency distributions and percentages, which were visualized through charts and graphs. Each figure represents one key variable of the study.

Result

Table-1: Socio-Demographic Characteristics

Variables	Number (%)
Age group (Years)	
10-20	70 (25.7)
21-30	86 (31.5)
31-40	60 (22)
41-50	38 (13.9)
51-60	11 (4)
61-70	8 (2.9)
Marital Status	
Married	182 (66.9)
Unmarried	90 (33.1)
Gender	
Male	175 (64.3)
Female	197 (35.7)
Religion	
Muslim	254 (93.3)
Hindu	18 (6.7)
Occupation	
Student	62 (22.7)
Housewife	60 (22.5)
Unemployed	35 (12.8)
Businessman	31 (11.3)
Labor	17 (6.2)
Service	16(5.8)
Mechanic	10 (3.6)
Farmer	10 (3.6)
Rickshaw Puller	10 (3.6)
Driver	7 (3.5)
Addicted	4 (1.4)
Servant	4 (1.4)
Thief	2 (0.8)
Car Mechanic	2 (0.8)

Table-1: Socio-Demographic Characteristics (Cont'd)

According to our observations, the largest percentage of data 86 (31.5%) came from the age group of 21 to 30. The lowest percentage 8 (2.9%) was found among those aged 61 to 70. Of the 272 cases, the majority were married 182 (66.9%), and 64.3% of the cases were male Muslims 254 (93.3%). We conducted this study on a number of people in a variety of occupations, and the highest number of cases were discovered among housewives 60 (22.5%) and students 62 (22.7%). Thieves 2 (0.8%) and auto mechanics 2 (0.8%) had the lowest numbers.

Table 2: Reason Behind the Cases

Cause	Number (%)
Familiar disharmony	60 (22.3)
Arrogance	50 (18.5)
Poverty	49 (18.3)
Depression	35 (12.6)
Mental Unsoundness	22 (8)
Anger	15 (5.5)
Occasional Ingestion	15 (5.5)
Chronic Illnesses	13 (4.7)
Argument	9 (3.3)
Snake Bite	2 (0.7)
Travellers Poison	2 (0.7)

Maximum cases were observed due to Familial disharmony 60 (22.3%) followed by Arrogance 50 (18.5%).

Table -3: Month-Wise Distribution

Month	Number (%)
January	29 (10.6)
February	15 (5.5)
March	12 (4.4)
April	19 (6.9)
May	18 (6.6)
June	25 (9.1)
July	17 (6.2)
August	34 (12.5)
September	39 (14.3)
October	30 (11)
November	30 (11)
December	22 (8)

Majority of the cases were noticed in month of September (14.3%) but in month of February (5.5%) which was minimal.

Table-4: List of Police Stations

Police stations	Total counts
Kotoali	130
South Keraniganj	20
Kadamtoli	8
Nawabganj	20
Gandaria	11
Kodomtoli	10
Badda	4
Keranigonj Model Thana	12
Dohar	8
Lalbagh	3
Kamrangir Char	22
Shampur	4
Jatrabari	5
Chawkbazar	2
Wari	6
Hazaribagh	3
Bongshal	3
Dakshinkhan	1

We carry out our observation among the police stations in the year of 2020 1st number 01 case noticed in Dokkhin Khan.

Table-5: Poisoning Cases

Poison	Number (%)
OPC	162 (59.5)
Alcohol	28 (10)
Aluminium Phosphate	18 (6.5)
Cypermethrin	16 (5.6)
Paraquat	11 (4)
Benzodiazepine	11 (4)
Zinc Phosphate	8 (2.9)
Bramadiolone	4 (1.4)
Hydrochloride	4 (1.4)
Salicylic Acid	3 (1.1)
Snake bite	2 (0.2)
Calcium Arsenide	2 (0.7)
Carbon Monoxide	2(0.7)
Hydro-cyanide	1 (0.3)
Aeroxen Weed Keeler	1 (0.3)
Corrosive	1 (0.3)
Kerosene	1 (0.3)
Phensedyl	1 (0.3)

Of the 272 poisoning instances OPC poisoning accounted for the most instances, 162 (59.5), followed by alcohol 28(10%).

Discussion

The COVID-19 pandemic has had a profound impact on people's mental health. Throughout the pandemic, a number of factors exacerbate people's psychological states, including fear of an uncertain future, economic downturn, loss of jobs and income, ambiguity, losing a family member, loneliness, etc. Additionally, the government's constant changes to its COVID-19 limits and social media misrepresentations cause public fear, which in turn causes anxiety and despair.[9] The significant rise in the number of hospitalized patients from 2019 to 2021, from 1834 to 2457, is an intriguing trend. These results were in line with another study from 2021, where it is reported that calls relating to poisoning exposures increased by 91% during the 2020 lockdown as compared to 2019.[10] Additionally, similar findings have been reported by poison centers in France, the United States, and Canada.[11] The alterations in behavior brought on by a dread of COVID-19, excessive housecleaning, and improper use of cleaning supplies for personal hygiene or food cleanliness. Additionally, isolation measures that led to a decline in cognitive abilities and decision-making, along with an increase in

impulsivity, are another problem that contributed to this increase. In terms of demographic data, the COVID-19 pandemic had an impact on the age distribution, and the mean age of admitted patients rose annually. The percentage of children under 7 years old increased from 11.7% in 2019 to 16.5% in 2020 before declining to 12.41% in 2021. In contrast, a research in 2023 reported a notable decline in this age group.[13] Additionally, the percentage of toxicity among school-age children (7–15) increased from 16.6% in 2019 to 19.66% in 2020 before falling to 17.87% in 2021. Adults with mood and anxiety issues during the lockdown experienced more problems as parents, which resulted in lower-quality care for children when schools were closed. Over the course of the study, the percentage of people in the 15–25 age group climbed significantly among all age groups, rising from 33.32% in 2019 to 34.5% in 2020 and 34.67% in 2021. Fayed and Sharif (2021) found similar results, showing that during the epidemic, adults experienced a higher number of toxicities.[15] In addition to stress brought on by the pandemic, the rise may be the result of their increased risk of being exposed to harmful substances in the general environment and at work.[16] The economic effects of the pandemic, which resulted in unemployment and worsened living conditions for men, caused the male to female ratio to first rise before tending to normalize in 2021.[17] Multifaceted mental health issues that are commonly linked to the morbidity and mortality of the COVID-19 pandemic may be the cause of the rise in suicide rates during the outbreak. The COVID-19 pandemic caused between 2135 and 9570 suicides annually worldwide, in addition to job losses.[17] Poisoning deaths are typically accidental or suicidal in nature. Organophosphorus compounds are the most frequently utilized substances for suicidal purposes. Chemicals like paraquat, parathion, and acetic acid are used to make rubber in South-East Asia, whereas opium, diazepum, and barbiturate are utilized for self-destruction. Dichlorvos (76% EC) is also utilized as an injectable suicide drug, according to an Indian study.[18,19,20] Some common observations made during post-mortem examinations of poisoning instances included the research subjects' cyanosis in the nose, lip, and finger, blood-stained froth in the mouth and nostrils, and the odd smell of OPC in the stomach contents. Every single organ was clogged. The stomach had a submucosal petechial hemorrhage. Additionally, there was subpleural peechial hemorrhage and excessive oedema.[21] Our nation's farmers apply pesticides without understanding the negative consequences. In Bangladesh, the most often used pesticides are synthetic pyrithroid, ogano carbamate, and organophosphate[22]. Spanish epidemiological research confirms the association between long-term OPC exposure and a higher risk of suicide.[23] Chronic Organo Phosphate Induced Neuro-Psychiatric Disorder (COPIND) is another illness that is brought on by prolonged exposure to OPC.[24,25,26] In situations of chronic OPC poisoning, genetic variations are also significant[27].Kerala 25 has the highest suicide rate in the state. The majority of victims are between the ages of 14 and 34, and OPC was the most often utilized substance for suicide.[28] In Sri Lanka, pesticide poisoning causes thousands of hospital admissions annually (16,649 in 1983) and more than 1,000 fatalities (1521 in 1983). About three-quarters of these are self-administered, with the remaining percentage being accidental and occupational.[29,30] According to a previous study conducted at our same study institute in Bangladesh between January and December 2009, 59% of all suicidal fatalities were caused by hanging, 31% by poisoning, and 10% by other causes such as burns, falls from heights, gunshot wounds, etc.[31]

Conclusion

The present study offers valuable insights into how the COVID-19 pandemic influenced the rate and pattern of poisoning deaths at Sir Salimullah Medical College. Findings revealed notable shifts in poisoning trends, with a rise in exposures to household chemicals, corrosives, and phosphides, particularly during lockdown periods, while drug overdose cases showed a decline in 2020 compared to 2021. The increase in phosphide poisoning and suicide-related cases may be attributed to the psychological and socio-economic stressors associated with lockdown restrictions. These observations highlight the crucial need for enhanced public awareness, stronger mental health and substance abuse interventions, and improved healthcare access during crises. The study underscores the importance of adopting an interdisciplinary and integrated approach that combines healthcare, community support, and policy-level measures to effectively prevent and manage poisoning deaths during and after global emergencies like the COVID-19 pandemic.

Source of Funding

For this research, no specific grant from a governmental, private, or nonprofit funding agency was acquired.

Conflict of Interest

The author declares no conflicts of interest.

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