

Self-medication: A Harmful Practice and a Cause of Poisoning Admissions in a Tertiary Care Hospital in Eastern India

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ABSTRACT

Background: The pattern of poisoning in India varies with socioeconomic status as well as region. A thorough understanding of the demographics and management of poisoning cases is essential for the development of well-informed policies, targeted interventions, and effective public awareness campaigns. The indiscriminate practice of self-medication in developing countries like India often leads to cases of overdosing, which poses a significant alarm. The present study aimed to explore poisoning cases in a tertiary care setup and determine the prevalence of self-medication-related overdosing as a cause of poisoning.

Materials and methods: This cross-sectional observational study included emergency admission cases of poisoning in whom demographic data including age and gender were noted. Information on the type and cause of poisoning were noted based on clinical records and history elicitation from patients or their caregivers. In the case of drug overdose-related poisoning cases, the chemical nature of the drug and the mode of the drug procurement were probed. Data were analyzed statistically.

Results: The study observed that the age group of less than 20 years was the most vulnerable, while the age group of more than 70 years was the least vulnerable. Females were most affected. Among the types of poisoning observed, accidental (49%) and suicidal (48%) intent were almost the same. About 2.55% of cases were homicidal. Drugs were most commonly the causative agents (39%). Among the drug-causing poisonings, self-medication-related overdose was as high as 40.98%. Among the various causative agents, sedatives-hypnotics were the most common causative drugs, including alprazolam, chlordiazepoxide, diazepam, and zolpidem. This was followed by antihistaminics, antitussives, and antihypertensives. On the contrary, prescription drugs were responsible for 59.01% of drug poisoning cases.

Conclusion: The healthcare system including the healthcare professionals and various government programs must come forward to educate the masses regarding the hazards of self-medication. This will impart knowledge and understanding of the self-medication practices and will curb the associated menace.

Keywords: Emergency admissions, Poisoning, Self-medication related overdosing.

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INTRODUCTION

Poisoning refers to the ingestion, inhalation, or absorption of substances that can cause harm to the body. These substances can include medications, household chemicals, pesticides, plants, and various toxic materials.¹ Poisoning can indeed be a significant and, in many cases, a preventable cause of death. Poisoning, unfortunately, remains a significant public health concern in India.² Mortality in acute poisoning is 2% in developed countries, while in developing countries like India, it is 30%.³ Approximately 50 thousand people die annually in India. According to the National Crime Records Bureau of India (NCRB), poisoning cases accounted for nearly 0.7% of all cognizable crimes registered in 2021.⁴ While this might seem like a small percentage, it translates to thousands of individual incidents. Intentional poisoning, often linked to suicides or homicides, constitutes a significant portion of cases. However, accidental poisoning, particularly among children and due to pesticide exposure, is also a major concern. Children under 5 years old and agricultural workers are at particular risk of accidental poisoning.⁵ Additionally, certain social and economic factors can increase the risk of intentional poisoning.

Drug overdose as a cause of poisoning also poses a significant alarm. It is a result when an individual ingests, inhales, or otherwise absorbs a quantity of a drug or substance that is beyond the body's normal tolerance levels, leading to harmful effects. Overdoses can be intentional, such as in cases of suicide attempts or substance abuse, or unintentional, often due to miscalculation of medication

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dosages, accidental ingestion, or drug interactions.¹ Overdoses can occur with prescription drugs, including analgesics, sedatives, antidepressants, and others. Illicit substances such as heroin, cocaine, methamphetamine, and synthetic opioids like fentanyl

are commonly associated with overdoses. Even common over-the-counter medications can cause overdose if taken in excessive amounts. Symptoms of a drug overdose can vary widely depending on the substance involved but may include respiratory depression, confusion, seizures, unconsciousness, and in severe cases, cardiac arrest. The major risk factors are multiple drug use, tolerance/dependence, underlying health conditions, etc.

Another prime factor that leads to overdosing, is self-medication practices. Self-medication-related overdosage is a significant public health concern. It involves individuals taking medications without proper medical supervision, which can lead to taking incorrect doses, inappropriate drug combinations, and ultimately, overdose. Self-medication has traditionally been defined as "the taking of drugs, herbs or home remedies on one's own initiative, or on the advice of another person, without consulting a doctor".⁶ It would be safe, if the people who are using it, have sufficient knowledge about its dose, time of intake, and side effect on overdose, but due to lack of information, it can cause serious events like overdosage. Thus, the indiscriminate practice of self-medication in developing countries like India often leads to overdosing and drug poisoning.^{7,8}

The pattern of poisoning in India varies with socioeconomic status as well as region. A thorough understanding of the demographics and management of poisoning cases is essential for the development of well-informed policies, targeted interventions, and effective public awareness campaigns.⁹ It ensures that efforts are directed where they are most needed, ultimately contributing to the reduction of poisoning incidents and improved public health outcomes. The present study tried to explore the poisoning cases in a Tertiary Care setup and determine the prevalence of self-medication-related overdose as a cause of poisoning.

MATERIALS AND METHODS

A cross-sectional observational study was conducted in a tertiary care teaching hospital in West Bengal for 1 year. The Institutional Ethics Committee approved the study procedures. The study was initiated after obtaining approval from the Institutional Ethics Committee.

The study included patients of all age groups attending the Emergency Department with a history of exposure to poison either by household or agricultural pesticides, sting bite, snake bite, industrial toxins, toxic plants, drugs, or miscellaneous products. The study excluded patients diagnosed with poisoning being brought dead.

For all the poisoning cases, demographic data including age and gender were noted. Information on the type and cause of poisoning were further noted based on clinical records and history elicitation from patients or their caregivers.

In the case of drug poisoning cases, the chemical nature in the case of the drug was noted. Manner of drug use on physician prescription or self-medication was noted by interviewing the patient or the patient relative as appropriate.

The data obtained was statistically analyzed. Descriptive data was represented as mean, standard deviation, frequency, and percentages as applicable. All statistical tests were conducted on standard statistical software like Graph Pad Prism and Microsoft Excel.

RESULTS

A total data of 157 patients were included in this study. The study observed that the age group of fewer than 20 years was the most

Table 1: Patient characteristics

Measures	No	%
Age distribution		
<20 years	56	35.7
20–29 years	51	32.5
30–39 years	23	14.6
40–49 years	10	6.4
51–59 years	9	5.7
61–69 years	6	3.8
≥70 years	2	1.3
Gender distribution		
Female	127	80.9
Male	30	19.1
Cause of poisoning		
Drugs	61	38.85
Snake-bite	33	21.02
Organophosphorus	18	11.46
Insects	16	10.19
Rodenticides	12	7.64
Pesticides	8	5.10
Acids	5	3.18
Disinfectants	2	1.27
Hydrocarbons	2	1.27

(36%) vulnerable, while the age group of more than 70 years was the least (1.3%) vulnerable. It was observed that females were most affected (81%) (Table 1).

Among the types of poisoning observed, accidental (49%) and suicidal (48%) intent was almost the same. About 2.55% of cases were homicidal. Accidental poisoning ($n = 107$) included 58 cases of drug poisoning, followed by 33 cases of snake bite and 16 cases of insect bite. Suicidal poisoning cases ($n = 46$) included various causes like drug ($n = 3$), organophosphorus ($n = 16$), rodenticides ($n = 11$), pesticides ($n = 8$), acids ($n = 4$), disinfectants ($n = 2$), and hydrocarbons ($n = 2$). About 4 cases of homicides included 2 cases of organophosphorus poisoning, and 1 case of rodenticide and acid poisoning respectively.

Notably, drugs were most commonly the causative agents (39%). Among the drug-causing poisoning, notably self-medication-related overdose was as high as 40.98% ($n = 25$). Among the various causative agents, sedatives-hypnotics were the most common causative drugs, including alprazolam ($n = 4$), chlordiazepoxide ($n = 5$), diazepam ($n = 8$) and zolpidem ($n = 2$). This was followed by antihistaminics [cetirizine ($n = 2$)], antitussives [cough syrup ($n = 5$)], and antihypertensives [Losartan ($n = 1$)].

On the contrary, prescription drugs were responsible for 59.01% of drug poisoning cases ($n = 36$). Among the prescription drugs, sedatives and hypnotics were again the commonest causative drugs, including alprazolam ($n = 4$), chlordiazepoxide ($n = 3$), diazepam ($n = 5$) and zolpidem ($n = 1$). This was followed by non-steroidal anti-inflammatory drugs including diclofenac ($n = 1$), ibuprofen ($n = 1$), and paracetamol ($n = 5$). Anticonvulsants [Phenytoin ($n = 2$),

Sodium valproate ($n = 1$), antidepressants [Amitriptyline ($n = 2$), Nortriptyline ($n = 1$)], antipsychotics [Haloperidol ($n = 1$)], antihistaminics [Cetirizine ($n = 1$)], antitussives [Cough syrup ($n = 2$)], and antihypertensives [Amlodipine ($n = 4$), Losartan ($n = 2$)] were among the other causative agents.

DISCUSSION

Self-medication refers to the practice of individuals treating their health conditions without professional medical guidance or supervision.¹⁰ While there are instances where self-medication may be appropriate, such as using over-the-counter (OTC) medications for minor ailments like headaches or mild colds, it can also pose risks if not done responsibly. Self-diagnosis can be inaccurate, as individuals may not have the necessary medical knowledge to correctly identify the underlying cause of their symptoms which can often lead to misdiagnosis.¹¹ Choosing the wrong medication or using the wrong dosage can lead to ineffective treatment or adverse effects. Different health conditions may require specific medications, and a healthcare professional can provide tailored advice. Self-medicating may provide temporary relief of symptoms without addressing the root cause of the problem. This can delay proper diagnosis and treatment. Combining medications without proper knowledge can result in dangerous interactions.^{11,12} Some drugs may interfere with each other, leading to unpredictable effects on the body. Even, without knowledge of allergies or potential sensitivities, individuals may inadvertently use medications that trigger allergic reactions, ranging from mild rashes to severe anaphylaxis. Also, inappropriate use of antibiotics, such as not completing a prescribed course, can contribute to the development of antibiotic resistance, making it harder to treat bacterial infections in the future. Relying on self-medication might lead to delayed consultation with a healthcare professional, particularly when symptoms persist or worsen. Some medications, even OTC ones, have the potential for abuse or dependency. Using medications improperly can contribute to addiction issues.¹³ The present study which tried to assess the poisoning cases in a tertiary care set-up in eastern India, found a considerable fraction of the drug-related poisoning cases (40.98%) a result of self-medication practices which is quite alarming.

Our study noted that adolescents and young adults constituted the highest reporting poisoning cohort, as compared to other studies.^{14–17} Adolescents engaging in self-medication practices can be a cause for concern due to the unique challenges and risks associated with this age group. Adolescents may lack comprehensive knowledge about medications, potential side effects, and appropriate dosage, which can lead to the misuse of medications or inadequate treatment. Adolescents may be more prone to experimenting with substances, including OTC medications, prescription drugs, or even herbal remedies. Such experimentation can pose serious health risks.¹⁴ Peer pressures to self-medicate or share medications can contribute to unsafe practices and an increased risk of adverse effects. Adolescents and young adults experiencing stress, anxiety, or other mental health issues may be tempted to self-medicate to alleviate symptoms, which leads to inappropriate use of medications and delayed professional intervention. Another upscaling menace is the easy accessibility of health information on the internet, which may lead adolescents to self-diagnose and self-prescribe medications without consulting healthcare professionals, resulting in inaccurate treatment and the possibility of drug poisoning in extreme cases.

Adolescents and young adults may not fully grasp the potential risks associated with self-medication, such as drug interactions, allergic reactions, or the development of antibiotic resistance. Lack of parental guidance or inappropriate modeling can contribute to risky self-medication practices in adolescents.^{14,16}

The prime causes of self-medication-related overdose are lack of knowledge, ease of drug access, misinterpretation, peer influence, and delay in seeking professional help. Many individuals are unaware of the proper dosages and potential side effects of medications. Also, OTC drugs and prescription medications are often easily accessible without proper regulation. Misreading labels or misunderstanding instructions can lead to incorrect dosing. Recommendations from friends or family members can lead to improper use. Some individuals prefer to self-medicate rather than consult a healthcare professional, which can exacerbate their condition.

To address the menace of self-medication, it is crucial to promote awareness and education about responsible healthcare practices. Encouraging individuals to seek professional medical advice, promoting proper medication management, and emphasizing the importance of completing prescribed courses of treatment can contribute to safer and more effective healthcare practices. Healthcare professionals also play a vital role in educating the public about the potential risks associated with self-medication and guiding individuals toward responsible health choices.¹⁸ Healthcare professionals can guide the appropriate use, dosage, and potential side effects of medications based on an individual's specific health condition, medical history, and other relevant factors. In case of accidental overdose or suspected poisoning, it is essential to seek immediate medical attention or contact a Poison Control Center. Education and awareness campaigns about responsible medication use can contribute to minimizing the risks associated with self-medication practices.¹⁸

The study has its strength in highlighting a major facet of self-medication-related overdosing—a gray area of research. The study has its limitations in having a small sample size and single-center observation. Poisoning cases were diagnosed clinically and based on history elicitation. A possibility of recall bias cannot be ruled out. No blood test was done to confirm the diagnosis. Future studies should overcome these limitations.

CONCLUSION

In countries like India economic status, education status, and access to healthcare are still constrained for many population strata. The healthcare system including the healthcare professionals and various government programs must come forward to educate the masses regarding the hazards of self-medication. This will impart knowledge and understanding of the self-medication practices and will curb the associated menace.

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