

Original Research Article**Clinico-Etiological Profile and Outcome of Deliberate Self-Poisoning Cases Presenting to a Tertiary Care Center in Kerala, India****Dr. Aswathy M.¹, Dr. Ratheesh Narayanan Santhanavally², Dr. Sajeesh K.³**

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ABSTRACT**Background**

Deliberate self-poisoning is a major public health concern, particularly in developing countries where easy access to pesticides and drugs increases morbidity and mortality. Young adults are predominantly affected, leading to significant social and economic burden. Understanding the clinical and etiological profile of DSP (Deliberate Self-Poisoning) is essential for preventive strategies and improved patient outcomes.

Methods

This hospital-based descriptive cross-sectional study included 250 adult patients (>18 years) with alleged deliberate self-poisoning admitted to the Department of Internal Medicine, Government Medical College, Thiruvananthapuram, over a period of two years. Data regarding socio-demographic details, type and quantity of poison consumed, clinical presentation, investigations, treatment, and outcomes were collected using a structured proforma. Statistical analysis was performed using SPSS version 25. The chi-square test was used to assess associations, and $p < 0.05$ was considered statistically significant.

Results

The majority of patients were aged 18–38 years (69.2%), with a slight female predominance (52%). Most participants had school or higher secondary education, and 48% were unemployed. Drug overdose was the most common method, with polypharmacy accounting for 26.8% of cases, followed by insecticides/pesticides (14.4%). Financial crisis (52.8%) was the leading precipitating factor, and 93.2% of acts were impulsive. Gastrointestinal symptoms (15.2%) were the most common clinical presentation. ICU care was required in 6.8%, mechanical ventilation in 4%, and overall mortality was 3.2%. Significant associations were observed between type of poison and sex, age, marital status, ICU requirement, mechanical ventilation, clinical outcome, and selected clinical parameters ($p < 0.05$).

Conclusion

Deliberate self-poisoning predominantly affects young adults and is commonly impulsive, with drugs being the most frequent agents. The type of poison significantly influences clinical severity and outcome. Early identification of high-risk groups and targeted preventive strategies are crucial to reduce morbidity and mortality associated with DSP.



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Keywords: Deliberate Self-Poisoning, Clinico-Etiological Profile, Drug Overdose, Pesticide Poisoning, Clinical Outcome.

INTRODUCTION

Poison is any substance that causes injury or death when introduced into the body through ingestion, inhalation, or contact. The WHO (World Health Organization) estimates that approximately 0.3 million people die annually due to various poisoning agents.^[1] Acute pesticide poisoning is one of the leading causes of intentional deaths worldwide.^[2] In industrialized countries, high doses of analgesics, tranquilizers, and antidepressants are commonly used for self-poisoning,^[3] whereas in Asian regions-particularly rural areas-agricultural pesticides are frequently employed, with a fatality rate ranging from 10–20%.^[4] The increasing use of agrochemicals in middle- and low-income countries has further amplified pesticide exposure.^[5] In India, pesticides are widely used for intentional poisoning, especially in rural communities where farming is the primary occupation.^[5] Globally, nearly one-third of suicides are attributed to pesticide self-poisoning, with regional variations ranging from 4% in Europe to over 50% in the Western Pacific region.^[6]

The Global Burden of Disease study reported 593,000 suicides in the developing world in 1990, accounting for 75% of global self-harm deaths.^[7] Although poisoning is common among young children, mortality remains higher in intentional adult cases.^[8,9] Not all individuals who attempt self-harm intend to die; many acts are impulsive or serve as expressions of distress.^[8-10] Cultural and emotional factors also influence suicidal behaviour^[11,12] and outcomes may not always correlate with intent.^[13]

Poisoning results in dose-related adverse effects, influenced by factors such as route of exposure, toxic properties, and host characteristics.^[14] A retrospective analysis from the National Poisons Information Center highlighted diverse agents, including pharmaceuticals, pesticides, and household products, with a high proportion of intentional cases among young adults.^[15] Given the significant social and economic impact of suicidal poisoning, especially among young individuals, region-specific epidemiological studies are essential to understand patterns and guide preventive strategies.

AIMS AND OBJECTIVES

The present study aims to analyze the clinico-etiological profile of deliberate self-poisoning cases presenting to Government Medical College, Thiruvananthapuram, with a focus on identifying demographic characteristics, types of poisons consumed, clinical presentations, and associated risk factors. Additionally, the study seeks to assess patient management strategies, including therapeutic interventions and supportive measures, and to evaluate the outcomes of treatment, such as duration of hospital stay, requirement of intensive care or mechanical ventilation, and overall mortality.

MATERIALS AND METHODS

Study Design

This hospital-based descriptive cross-sectional study was conducted in the Department of Internal Medicine at Government Medical College, Thiruvananthapuram, Kerala from 2021 to 2023. The study population comprised all adult patients admitted to the general medicine wards with a history of deliberate self-poisoning during the study period, who met the inclusion criteria and provided informed consent. The cross-sectional design enabled systematic

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assessment of the clinico-etiological profile, management, and outcomes of cases at the time of hospital presentation without follow-up beyond the admission period.

Inclusion and Exclusion Criteria

The study included all patients aged more than 18 years who were admitted to the medicine wards of Government Medical College, Trivandrum, with an alleged history of deliberate consumption of poisonous substances, including household or agricultural pesticides, industrial toxins, toxic plant products, and drugs, and who provided informed consent. Patients were excluded if the history of poisoning was doubtful, if the case involved food poisoning, or if the poisoning resulted from venomous bites and stings.

Sample Size Calculation

Sample size (N) was calculated using the formula: $N = (Z\alpha^2 * P * Q) / d^2$

$N = 244.01$, Where

Z = Z value (1.96 for 95% confidence level, when $\alpha = 0.05$).

P = Proportion of Organophosphate poisoning (19.8% = 0.198).

Q = 1-P (1 - 0.198 = 0.802).

d = 5% absolute precision (e.g., .05 = ± 5).

By taking P as 19.8% and with a confidence interval of 95%, the minimum sample size as per the above formula was calculated to be 244, which may be conveniently taken as 250.

Data Collection Procedure

Eligible patients who satisfied the inclusion criteria and provided informed consent were recruited consecutively until the required sample size was achieved. Data were collected using a structured study proforma. After obtaining consent, each patient underwent detailed history taking, a thorough clinical examination, and relevant laboratory investigations. Information recorded included socio-demographic variables (age, gender, residence, education, occupation, and marital status), details of the poisoning episode (type and name of poisonous agent, quantity consumed, and first aid received), clinical presentation, laboratory findings, treatment administered (including specific antidotes), complications, duration of hospital stay, need for intensive care or mechanical ventilation, and final outcome, including recovery or mortality and its causes.

Statistical Analysis

The collected data were entered into Microsoft Excel and subsequently analyzed using SPSS software version 25. Categorical variables were summarized as frequencies and proportions, while quantitative variables were expressed as mean and standard deviation. The association between categorical variables was assessed using the chi-square test. A p-value of less than 0.05 was considered statistically significant for all analyses.

RESULTS

Variable	Category	Frequency	Percentage
Age (in years)	18–28	98	39.2%
	28–38	75	30.0%
	38–48	34	13.6%
	48–58	15	6.0%
	58–68	18	7.2%
	68–78	10	4.0%

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Sex	Male	120	48%
	Female	130	52%
Marital Status	Married	145	58.0%
	Unmarried	76	30.4%
	Separated	18	7.2%
	Divorced	11	4.4%
Occupation	Unemployed	119	47.8%
	Employed	97	38.6%
	Students	33	13.2%
	Others	1	0.4%

Table 1: Socio-Demographic Characteristics of Study Population (N = 250)

Table 1 illustrates that the majority of patients belonged to the 18–38 years age group (69.2%), with a slight female predominance (52%). Most were married (58%) and unemployed (47.8%), indicating young adults from economically vulnerable groups were predominantly affected.

Variable	Category	Frequency	Percentage
Education	Illiterate	5	2.0%
	School Education	105	42.0%
	Higher Secondary	96	38.4%
	Degree & Above	44	17.6%
Mode of Admission	Direct	202	80.8%
	Referred	48	19.2%

Table 2: Educational Status and Mode of Admission

Table 2 observes that most patients had school or higher secondary education (80.4%). A large proportion (80.8%) were directly admitted, indicating timely access to tertiary care.

Type of Poison	Frequency	Percentage
Other Drugs	84	33.6%
Polypharmacy	67	26.8%
Insecticides/Pesticides	36	14.4%
Antipyretic/Analgesics	20	8.0%
Plant Poisons	16	6.4%
Antimicrobials	10	4.0%
Corrosives	9	3.6%
Other Chemicals	8	3.2%

Table 3: Type of Poison Consumed

Table 3 shows that drug overdose was the most common method of deliberate self-poisoning, particularly other drugs and polypharmacy (60.4% combined). Insecticides and pesticides were the most common single toxic agents.

Variable	Category	Frequency	Percentage
Psychiatric Illness	Yes	15	6.0%
Previous DSH	Yes	15	6.0%
Alcohol Use	Yes	33	13.2%
Alleged Reason	Financial Crisis	132	52.8%

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	Relationship Issues	73	29.2%
	Psychiatric Illness	13	5.2%
	Unknown	32	12.8%

Table 4: Risk Factors and Alleged Reasons

Table 4 demonstrates that the financial crisis (52.8%) was the leading precipitating factor. Alcohol use (13.2%) was the most common associated risk factor.

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Clinical Feature	Present	Percentage
GI Symptoms	38	15.2%
Arrhythmia	12	4.8%
Hypotension	11	4.4%
Hepatic Impairment	13	5.2%
Coagulopathy	13	5.2%
Hyperkalemia	5	2.0%
Hypoglycemia	5	2.0%
Renal Impairment	4	1.6%
Metabolic Acidosis	4	1.6%
Seizures	2	0.8%
Respiratory Depression	2	0.8%
GCS < 10	6	2.4%

Table 5: Clinical Profile of Patients

Table 5 illustrates that gastrointestinal symptoms were the most common presentation (15.2%). Cardiovascular and hepatic complications were also notable.

Treatment	Yes	Percentage
Gastric Lavage	241	96.4%
Symptomatic Treatment	247	98.8%
Dialysis/Hemoperfusion	2	0.8%
Pacemaker Implantation	2	0.8%
Feeding Jejunostomy	2	0.8%
Specific Antidote Given	43	17.2%

Table 6: Treatment Given

Table 6 observes that nearly all patients received gastric lavage and symptomatic treatment. Only a small percentage required advanced interventions such as dialysis or pacemaker insertion.

Variable	Category	Frequency	Percentage
Hospital Stay	<2 days	11	4.4%
	2-5 days	222	88.8%
	>5 days	17	6.8%
ICU Care Required	Yes	17	6.8%
Mechanical Ventilation	Yes	10	4.0%
Outcome	Recovered	242	96.8%
	Expired	8	3.2%

Table 7: Hospital Course and Outcome

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Table 7 demonstrates that most patients required short hospital stays (2–5 days). ICU care was required in 6.8%, and overall mortality was 3.2%, with the majority recovering after treatment.

DISCUSSION

This hospital-based cross-sectional study was conducted among 250 patients admitted with deliberate self-poisoning to analyze their clinico-etiological profile and treatment outcomes.

The majority of patients belonged to the 18–38 years age group (69.2%), with 39.2% in 18–28 years. Similar age predominance has been reported by Celine et al.^[16] Khadka et al.^[17] and Ramesha et al.^[18] where young adults constituted the most affected group. This highlights the significant social and economic impact of deliberate self-poisoning in the productive age group.

In the present study, females (52%) slightly outnumbered males (48%). While Celine et al.^[16] and Ramesha et al.^[18] reported male predominance, Khadka et al.^[17] observed higher incidence among females, which is consistent with our findings. Most participants had school or higher secondary education, and nearly half were unemployed. Though many previous studies have not extensively analyzed educational and occupational status, unemployment may represent an important psychosocial stressor.

Drug overdose was the most common method, particularly polypharmacy (26.8%), followed by insecticides and pesticides (14.4%). Jesslin et al.^[5] reported organophosphates as the most common agents, while Celine et al.^[16] observed significant insecticide-related poisoning. Compared to Jesslin et al.^[5] our study showed a higher proportion of multiple drug ingestion.

Only 6% had prior psychiatric illness and 6% had previous self-harm attempts, but 93.2% were categorized as impulsive acts on psychiatric evaluation. Previous literature emphasizes that deliberate self-poisoning is a strong predictor of future suicide, with significant long-term mortality risk.^[19-26] Unlike Williams et al.^[27] where many patients did not receive psychosocial assessment, all patients in our study underwent psychiatric evaluation.

Financial crisis (52.8%) was the most common precipitating factor, differing from Abhilash et al.^[28] where domestic conflicts were predominant. Most patients recovered (96.8%), with a mortality rate of 3.2%, lower than the 7.8% mortality reported by Celine et al.^[16]

Significant correlations were found between type of poison and sex, age, marital status, ICU requirement, mechanical ventilation, and clinical outcome. Cardiovascular manifestations, hepatic impairment, coagulopathy, hyperkalemia, and gastrointestinal symptoms were significantly associated with specific poisons, whereas hypoglycemia, respiratory depression, seizures, GCS <10, and renal impairment showed no significant association.

Overall, the study underscores the importance of early identification, psychiatric intervention, and targeted preventive strategies in reducing morbidity and mortality due to deliberate self-poisoning.

LIMITATIONS

This study was conducted at a single tertiary care center, which may limit the generalizability of the findings to other settings or regions. As it was a cross-sectional study, no follow-up was performed to evaluate the long-term sequelae, recurrence, or psychosocial outcomes of deliberate self-poisoning. The study focused exclusively on poisoning as a method of deliberate self-harm; therefore, other methods such as hanging, self-inflicted injuries, or drowning were not included. Additionally, only patients aged above 18 years were considered, and hence

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deliberate self-poisoning attempts among adolescents and school-going children below 18 years were not assessed.

CONCLUSION

This study analyzed the clinico-etiological profile and treatment outcomes of deliberate self-poisoning cases presenting to Government Medical College, Thiruvananthapuram. The majority of patients were young adults aged 18–38 years, with a slight female predominance. Drug overdose, particularly polypharmacy, was the most common method of poisoning, followed by insecticides and pesticides. Financial crisis was identified as the leading precipitating factor, and most acts were impulsive in nature. Although the overall mortality rate was low (3.2%), a significant association was observed between the type of poison consumed and socio-demographic factors, need for ICU care, mechanical ventilation, clinical manifestations, and final outcome. Early recognition, appropriate medical management, and comprehensive psychiatric evaluation are essential to reduce morbidity and mortality associated with deliberate self-poisoning.

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