



Original Research Article

A Study of Clinical and Demographic Characteristics of Poisoning Cases at Government Medical College, Doda, J&K

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Abstract: **Background:** Acute poisoning is a major public health concern in developing countries and constitutes a significant proportion of emergency department admissions in India, particularly in rural and agrarian regions. The pattern of poisoning varies according to local availability of toxic agents, socioeconomic factors, and healthcare accessibility. **Objectives:** To evaluate the clinical profile, demographic characteristics, pattern, intent, management, and outcomes of patients admitted with acute poisoning at Government Medical College, Doda, Jammu and Kashmir. **Materials and Methods:** This hospital-based observational study was conducted over a period of one year and included 100 patients admitted with a history of acute poisoning. Data were collected using a pre-designed structured proforma documenting demographic details, type and intent of poisoning, time interval between exposure and hospital presentation, clinical features at admission, treatment modalities, and outcomes. Data were analysed using descriptive statistics and expressed as frequencies and percentages. **Results:** The majority of patients were young adults aged 21–40 years, with a male predominance and a higher representation from rural areas. Suicidal poisoning was the most common mode of exposure. Organophosphorus compounds were the most frequently implicated agents, followed by pharmaceutical drugs. More than half of the patients presented within six hours of exposure. Most patients recovered with appropriate medical management, while a smaller proportion developed complications or succumbed to poisoning. **Conclusion:** Acute poisoning at GMC Doda predominantly affects young adults from rural backgrounds and is largely driven by suicidal intent and pesticide exposure. Targeted preventive strategies focusing on mental health support, regulation of toxic substances, public awareness, and strengthening rural emergency services are essential to reduce poisoning-related morbidity and mortality.

Keywords: Acute poisoning; Organophosphorus compounds; Suicidal poisoning; Rural health; Clinical profile.

INTRODUCTION

Acute poisoning represents a major public health problem worldwide, with a disproportionately higher impact in low- and middle-income countries where it constitutes a significant cause of morbidity and mortality. In the Indian scenario, poisoning contributes to nearly 20–30% of emergency department admissions in tertiary care hospitals, placing a substantial burden on the healthcare system¹. The epidemiological characteristics of poisoning are country-specific and depend on the

accessibility and availability of toxic substances, socioeconomic conditions, and health-seeking behaviour of the population. Pesticide poisoning remains a leading cause of acute poisoning in India, particularly in rural and agricultural regions. Organophosphorus compounds, aluminium phosphide, and herbicides are commonly implicated because of their widespread availability and, in many instances, illegal sale². Agriculturally developed states report a large number of poisoning cases, with deliberate self-harm using agricultural poisons being alarmingly common in several regions³. However,

published data from tribal, semi-urban, and remote populations with delayed access to healthcare services remain limited.

Tertiary care institutions, including government medical colleges, function as major referral centres for poisoning cases from surrounding rural areas. Poor awareness regarding safe handling and storage of pesticides, underlying mental health disorders, and the absence of poison control centres further contribute to both accidental and intentional poisoning. Young adults are most commonly affected, males outnumber females, and the majority of cases are associated with suicidal intent⁴. Poisoning due to suicidal or accidental exposure continues to cause significant morbidity and mortality globally and has emerged as a common method of deliberate self-harm. The nature of the poison used varies across regions and even within the same country, largely influenced by local availability and social factors. In India, insecticides have traditionally been the most frequently used agents for self-poisoning⁵⁻⁸. Referral care hospitals may not always reflect true rural poisoning patterns due to geographical and healthcare access differences. The increasing availability of over-the-counter medications and newer pharmaceutical agents with uncertain toxicity profiles has further complicated the pattern of poisoning⁹, and unusual routes of exposure have also been documented¹⁰.

National data indicate a steady rise in suicide rates in India, with poisoning being one of the commonly employed methods¹¹. The pattern of poisoning in a given region is influenced by availability of poisons, socioeconomic status, literacy levels, gender roles, occupational exposure, and cultural practices. Extensive use of pesticides in agriculture, rapid industrialisation, and unsafe storage of toxic substances have contributed to the increasing incidence of poisoning¹²⁻¹⁴. The clinical presentation of acute poisoning depends on the type of agent consumed, the quantity and route of exposure, the time elapsed before seeking medical care, and the age and general health status of the individual¹⁵. Early medical intervention, including prompt resuscitation, gastric decontamination, and administration of specific antidotes, improves patient outcomes; however, specific antidotes are not universally available, and standardised treatment protocols are not always followed^{16,17}. Poisoning also carries important medico-legal implications. Acute poisoning may occur through ingestion, inhalation, dermal, ophthalmic, or parenteral exposure and remains a frequent cause of hospital admission¹⁸. Organophosphorus compounds continue to account

for a substantial proportion of poisoning cases in India due to their extensive agricultural use and easy availability^{19,20}. Although geriatric patients constitute a smaller proportion of poisoning cases, they are particularly vulnerable due to multiple comorbidities and altered drug handling, resulting in higher complication rates^{21,22}.

Jammu and Kashmir, with its predominantly rural population and challenging terrain, faces unique healthcare challenges. Limited data are available on the poisoning profile from this region, especially from district-level medical colleges. Therefore, this study was undertaken to analyze the clinical and demographic characteristics of poisoning cases presenting to Government Medical College, Doda, to help identify vulnerable populations and inform preventive strategies.

MATERIALS AND METHODS

The present hospital-based observational study was conducted at Government Medical College, Doda, a tertiary care referral center catering to rural and semi-urban populations of the district. The study was done over a period of one year on 100 patients admitted with a history of acute poisoning to the emergency department and medical wards.

Inclusion Criteria

- Patients of all age groups admitted with a history of acute poisoning
- Both genders
- Patients or attendants providing informed consent

Exclusion Criteria

- Chronic poisoning
- Food poisoning
- Snake bite or insect envenomation
- Patients brought dead or leaving against medical advice

Data were collected using a pre-designed structured proforma, including: Demographic details (age, gender, residence, occupation), type and intent of poisoning, time interval between exposure and hospital presentation, clinical features at presentation, treatment received and Outcome

Data were entered into Microsoft Excel and analyzed using descriptive statistics. Results were expressed as frequencies and percentages, similar to methodologies adopted in previous Indian studies on poisoning.

RESULTS

Table 1: Distribution of Poisoning Cases as per Age, Gender, Residence and Occupation

Parameters	Category	No. of Patients	Percentage
Age in Years	≤20	18	18%

	21–40	62	62%
	41–60	15	15%
	>60	5	5%
Gender	Male	64	64%
	Female	36	36%
Residence	Rural	71	71.0%
	Urban	29	29.0%
Occupation	Farmers/Agricultural workers	34	34.0%
	Homemakers	21	21.0%
	Students	18	18.0%
	Labourers	15	15.0%
	Others	12	12.0%

The majority of poisoning cases (62%) occurred in the 21–40-year age group, indicating that acute poisoning predominantly affected young and economically productive individuals. A smaller proportion of cases were observed in the elderly population (5%). A male predominance was observed, with males constituting nearly two-thirds of all poisoning cases, suggesting higher exposure or vulnerability among males. Most patients (71%) belonged to rural areas, highlighting the greater burden of poisoning in rural populations and the role of agricultural and household exposure. Farmers/Agricultural workers formed the largest occupational group affected by poisoning (34%), followed by homemakers (21%) and students (18%), reflecting occupational exposure and psychosocial factors.

Table 3: Type and Intent of Poisoning (n = 100)			
Parameters	Category	No. of Patients	Percentage
Type of Poisoning Agent	Organophosphorus compounds	38	38%
	Pharmaceutical drugs	26	26%
	Rodenticides	14	14%
	Household chemicals	12	12%
	Unknown	10	10%
Intent of Poisoning	Suicidal	72	72%
	Accidental	28	28%

Organophosphorus compounds emerged as the most commonly implicated poisoning agents (38%), followed by pharmaceutical drugs (26%). Rodenticides (14%) and household chemicals (12%) constituted a moderate proportion, while a small percentage of cases (10%) involved unidentified agents. This distribution reflects the continued dominance of agricultural and medicinal substances as major sources of poisoning. The majority of poisoning cases were intentional (72%), indicating that suicidal exposure represents the predominant mode of poisoning. Accidental poisoning accounted for less than one-third of cases (28%), emphasizing the significant role of psychosocial and mental health factors in poisoning incidents.

Table 3: Time Interval Between Poisoning and Hospital Presentation, Clinical Features at Presentation, Treatment Received and Outcome (n = 100)			
Parameters	Category	No. of Patients	Percentage
Time Interval	< 6 hours	58	58.0%
	6–12 hours	27	27.0%
	> 12 hours	15	15.0%
Clinical features	Vomiting	68	68.0%
	Altered sensorium	41	41.0%
	Respiratory distress	29	29.0%
	Excessive salivation/sweating	36	36.0%
	Abdominal pain	22	22.0%
Treatment received	Gastric lavage	76	76.0%
	Antidotes administered	44	44.0%
	Supportive treatment only	32	32.0%
	ICU care	21	21.0%
	Mechanical ventilation	12	12.0%
Outcome	Recovered	84	84.0%
	Complications	10	10.0%
	Death	6	6.0%

More than half of the patients presented to the hospital within 6 hours of exposure (58%), 27% reached within 6-12 hours while 15% presented after a delay of more than 12 hours. Vomiting was the most common presenting symptom (68%), followed by altered sensorium (41%) and excessive salivation or sweating (36%), reflecting cholinergic and gastrointestinal involvement. Most patients underwent gastric lavage (76%), while antidotes were administered in less than half of the cases (44%). Approximately one-fifth of patients required ICU admission (21%), and a smaller proportion required ventilatory support (12%). The majority of patients recovered following treatment (84%). Complications occurred in 10% of cases, and the overall mortality rate was 6%.

DISCUSSION

In the present study, 62% of patients were aged 21–40 years, while 18% were ≤ 20 years and 5% were > 60 years. A similar clustering in young adults has been reported in North Maharashtra, where the 18–30-year group formed 45.3% of cases (Kumar SV et al., 2015)¹. A predominance of the productive age group was also noted in Amravati, where 15–44 years constituted 81.52% of cases (Jawarkar A et al., 2022)²³. Comparable central tendencies have been described from Bangalore with a mean age of 28.5 years (Sujatha KJ et al., 2017)²⁴, and from Dharwad with a mean age of 31.48 years (Patil NS et al., 2021)²⁵ together supporting that acute poisoning largely affects young, economically active populations. Males constituted 64% of cases in the present study. This aligns with the male predominance in North Maharashtra (61.3% males) (Kumar SV et al., 2015)¹ and with organophosphorus-focused emergency admissions where males formed 71% of cases (Kumar SV et al., 2015)¹. However, regional variation exists; Dharwad reported a female predominance (63%) (Patil NS et al., 2021)²⁵, while Bangalore showed an almost equal distribution (50.4% males vs 49.6% females) (Sujatha KJ et al., 2017)²⁴. These differences likely reflect local sociocultural patterns, occupational exposure, and healthcare utilization.

In the present study, 71% of cases were from rural areas. This rural predominance is consistent with North Maharashtra (60% rural) (Kumar SV et al., 2015)¹ and is biologically plausible in agriculturally driven communities where pesticide availability and occupational exposure are higher (Peter JV et al., 2014)². The rural skew is also supported by broader Indian observations where poisoning patterns correlate strongly with accessibility of toxic agricultural substances and delayed healthcare access in peripheral areas (Dash SK et al., 2005)⁴. Agricultural workers accounted for 34% of cases in the present study, followed by homemakers (21%) and students (18%). While occupation categories vary across reports, the association of poisoning with agrarian exposure is coherent with regions where pesticides dominate poisoning agents (Peter JV et al., 2014)² and where organophosphorus compounds contribute substantially to the poisoning burden (Hundekari I et al., 2012¹⁹; Chendake M, Mohote V, 2013²⁰). In Dharwad, “homemakers or students” together comprised 64% (32% each) (Patil NS et al., 2021)²⁵, emphasizing that domestic and psychosocial contexts can be prominent drivers even when

agricultural poisons remain easily accessible.

Organophosphorus compounds were the most common agents in the present study (38%), followed by pharmaceutical drugs (26%). The OP proportion is close to North Maharashtra (36.7% OP) (Kumar SV et al., 2015)¹ and Bangalore (28.8% OP) (Sujatha KJ et al., 2017)²⁴. Higher OP proportions have been reported from Amravati (61.36% OP) (Jawarkar A et al., 2022)²³, reflecting regional differences in pesticide access and usage. Drug-related poisoning in the present study (26%) is directionally consistent with Dharwad where pharmaceutical drugs accounted for 40% (non-OP compounds) (Patil NS et al., 2021)²⁵, and also supports the broader concern regarding increasing medication overdose with OTC availability and newer drugs (Zilker T, 2014)¹⁴. Overall, the present distribution indicates a dual burden: continued OP dominance plus a substantial contribution from drug overdose. Suicidal intent constituted 72% of cases in the present study. This closely matches North Maharashtra (70% suicidal) (Kumar SV et al., 2015)¹ and Dharwad (78% suicidal) (Patil NS et al., 2021)²⁵, underscoring the central role of self-harm in poisoning epidemiology. The sustained predominance of suicidal intent is compatible with national suicide trends and the continued use of poisoning as a method of deliberate self-harm (National Crime Record Bureau, 2014)¹¹, with patterns shaped by access, socioeconomic stressors, and help-seeking behaviour (Kumar SV et al., 2015)¹.

In the present study, 58% reached the hospital within < 6 hours, 27% within 6–12 hours, and 15% after > 12 hours. Early presentation is a key determinant of outcome, and North Maharashtra similarly emphasized worse outcomes with delayed presentation (qualitatively), with many cases being rural referrals (Kumar SV et al., 2015)¹. In OP-focused emergency admissions, 67% presented within < 6 hours (Kumar MRK et al., 2024)²⁶, comparable to the present early-arrival proportion. Bangalore reported very early care-seeking with 81.2% obtaining medical help within 1 hour (Sujatha KJ et al., 2017)²⁴, likely reflecting differences in geography and access that are particularly relevant to hilly and rural districts like Doda. Vomiting was the most common symptom (68%) in the present study, followed by altered sensorium (41%) and salivation/sweating (36%). These features are clinically consistent with common pesticide/OP exposure patterns, where cholinergic symptoms and gastrointestinal manifestations are

frequent (Hundekari I et al., 2012¹⁹; Chendake M, Mohote V, 2013²⁰). Altered mentation is also recognized as a common presentation in poisoning cohorts, particularly when alcohol, sedatives, or mixed exposures are involved (Kaeley N et al., 2019)²⁷, supporting the mixed-agent profile observed in the present series.

Gastric lavage was performed in 76%, antidotes were administered in 44%, ICU care was required in 21%, and mechanical ventilation in 12%. The need for critical care and ventilatory support is consistent with clinical severity patterns described in poisoning populations, where complications and need for escalation are more frequent in severe exposures or delayed presentations (Kumar SV et al., 2015)¹. Severity-based stratification tools such as GCS and PSS have shown significant association with outcome in OP poisoning (Kumar MRK et al., 2024)²⁶, and the present ICU/ventilation proportions likely reflect a subset with higher clinical severity. In the present study, 84% recovered, 10% developed complications, and 6% died. Recovery in North Maharashtra was 84%, closely matching the present recovery rate, while mortality there was 12% (Kumar SV et al., 2015)¹, higher than the 6% observed here possibly reflecting differences in agent toxicity, referral delays, or case severity. Bangalore reported recovery of 91.6% with mortality 5.2% (Sujatha KJ et al., 2017)²⁴, comparable to the present mortality. Dharwad reported a lower mortality of 3% (Patil NS et al., 2021)²⁵, whereas OP-focused emergency admissions reported mortality 17% (Kumar MRK et al., 2024)²⁶, highlighting that case-mix (OP-only vs mixed poisons), time to presentation, and clinical severity strongly influence fatality patterns.

CONCLUSION

Acute poisoning at Government Medical College, Doda, primarily involves young adults, with a clear male predominance and a higher burden among individuals from rural backgrounds. Suicidal exposure constitutes the most frequent mode of poisoning, and organophosphorus compounds remain the most commonly implicated agents, reflecting the continued accessibility and use of agricultural pesticides in the region. These findings underscore the need for a multipronged preventive approach that includes strengthening mental health services, regulating the availability and safe handling of toxic substances, enhancing public awareness, and improving timely access to emergency medical care, particularly in rural and remote areas.

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