



CLINICAL PROFILE AND OUTCOME OF SYNTHETIC COW DUNG POWDER POISONING: A RETROSPECTIVE ANALYSIS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Synthetic cow dung powder poisoning is an emerging toxicological emergency in rural South India due to its easy availability and low cost. The compounds commonly contain Auramine-O and Malachite Green, which are associated with severe hepatic, neurological, renal, and cardiovascular toxicity. This study was conducted to evaluate the clinical profile, laboratory abnormalities, and outcomes of patients with synthetic cow dung powder poisoning.

Methodology: This retrospective observational study was conducted in the Department of Emergency Medicine at from October 2025 to March 2026. A total of 35 patients with synthetic cow dung powder poisoning were included. Demographic details, clinical features, laboratory parameters, ECG findings, complications, and outcomes were analyzed using hospital medical records. Statistical analysis was performed using SPSS version 25.0.

Results: Among the 35 patients, 82.8% were females and the mean age was 30.9 years. Auramine-O poisoning was identified in 78% of cases. Jaundice was the most common clinical feature (60%), followed by abdominal pain and vomiting. Elevated liver enzymes were observed in 85.7% of patients, while renal dysfunction was present in 40%. Metabolic acidosis was noted in 20% and ECG abnormalities in 22.8% of cases.

Conclusion: Synthetic cow dung powder poisoning is associated with significant multiorgan toxicity, particularly hepatic dysfunction. Early recognition and prompt supportive management are essential to reduce morbidity and mortality.

Keywords: Synthetic Cow Dung Powder Poisoning, Auramine-O, Malachite Green, Hepatotoxicity, Poisoning, Multiorgan Dysfunction.

INTRODUCTION

Poisoning remains an important public health problem in developing countries, especially in rural regions where toxic household and agricultural substances are easily accessible [1]. In southern parts of India, synthetic cow dung powder poisoning has emerged as an uncommon but increasingly recognized form of suicidal poisoning among rural populations. Traditionally, natural cow dung was widely used for cleaning household courtyards, kitchens, and temple premises because of its believed antiseptic and purifying properties.

It was also utilized as a mosquito repellent and as a fuel source for biogas production [2]. However, with urbanization, modernization, and reduced availability of natural cow dung, synthetic cow dung powder products have increasingly replaced the traditional organic form.

Synthetic cow dung powder, commonly referred to as “Saani powder” in many regions of South India, is inexpensive, easily available, and commonly used for household and religious purposes [3]. Chamarajanagar and neighboring districts of Karnataka and Tamil Nadu share similar geographical and socio-cultural practices where the use of synthetic cow dung powder is widespread. Unfortunately, due to its easy accessibility and low cost, this compound has become a commonly used poison for deliberate self-harm in rural communities [4].

Synthetic cow dung powder mainly contains chemical dyes such as Auramine-O and Malachite Green. Auramine-O is a diarylmethane dye widely



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used in industrial products and is known to possess significant toxic effects on multiple organ systems [5]. It is primarily hepatotoxic and neurotoxic, leading to liver dysfunction, encephalopathy, seizures, and altered sensorium. Additionally, Auramine-O can cause gastrointestinal irritation, ocular injury, and renal impairment [6]. Malachite Green, another commonly identified component, is associated with cardiotoxicity, respiratory distress, renal dysfunction, and multiorgan failure [7]. Experimental studies have also demonstrated that chronic exposure to Malachite Green may result in carcinogenesis, mutagenesis, and pulmonary toxicity including pneumoconiosis [8].

The clinical manifestations of synthetic cow dung powder poisoning vary depending on the quantity consumed, time to hospital presentation, and presence of associated complications. Common presenting symptoms include vomiting, abdominal pain, jaundice, altered mental status, respiratory distress, and cardiovascular instability [9]. Severe poisoning can rapidly progress to acute liver failure, shock, metabolic acidosis, and death. Despite its increasing incidence in rural South India, literature regarding the clinical profile, complications, and outcomes of synthetic cow dung powder poisoning remains limited.

Previous studies by Krishnamoorthy et al. and other researchers have described various systemic manifestations associated with this poisoning, emphasizing the need for early recognition and aggressive supportive management [10]. However, there is limited data regarding demographic patterns, clinical presentation, laboratory abnormalities, and prognostic factors in affected patients. A better understanding of these aspects may help clinicians identify high-risk cases early and improve treatment outcomes.

Therefore, the present retrospective study was undertaken to analyze the demographic characteristics, clinical features, laboratory findings, complications, and outcomes of patients admitted with synthetic cow dung powder poisoning in a tertiary care hospital setting.

Aim

To study the clinical profile, complications, and outcomes of patients with synthetic cow dung powder poisoning admitted to a tertiary care hospital.

Objectives

1. To analyze the demographic characteristics of patients presenting with synthetic cow dung powder poisoning.
2. To study the clinical manifestations and laboratory abnormalities associated with synthetic cow dung powder poisoning.
3. To evaluate the pattern of organ involvement and complications in affected patients.

4. To assess the treatment modalities and supportive measures provided to patients with synthetic cow dung powder poisoning.

MATERIALS AND METHODS

This retrospective observational study was conducted in the Department of Emergency Medicine at over a study period from October 2025 to March 2026. All patients admitted with a history of synthetic cow dung powder poisoning during the study period were included in the study. Cases involving poisoning due to other toxins or combined poisoning with multiple substances were excluded. Patients who were brought dead to the hospital and those discharged against medical advice were also excluded from the study.

Relevant demographic and clinical details were collected from hospital medical records, case sheets, treatment charts, discharge summaries, and follow-up records. Detailed information regarding clinical presentation, symptoms, signs, vital parameters, and systemic examination findings at the time of admission were documented. Clinical history was also obtained from patients who had recovered from poisoning whenever feasible.

Laboratory investigations including complete blood count, liver function tests, renal function tests, serum electrolytes, and arterial blood gas (ABG) analysis were reviewed and analyzed. Electrocardiogram (ECG) findings were assessed in all patients to identify cardiac abnormalities. Radiological investigations such as ultrasound abdomen and computed tomography (CT) of the brain were performed in selected patients whenever clinically indicated. Details regarding treatment modalities, supportive management, duration of hospital stay, complications, and final outcome were also recorded and analyzed.

The collected data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) software version 25.0. Continuous variables were expressed as mean $\pm$ standard deviation, while categorical variables were presented as frequencies and percentages. Associations between clinical variables and patient outcomes were analyzed using Chi-square test and independent t-test wherever appropriate. A p-value of less than 0.05 was considered statistically significant.

RESULT

Out of a total of 310 suicidal poisoning cases, 35 (11.29%) were due to synthetic cow-dung powder poisoning. There were 29 (82.8%) females and 06 (17.14%) males with female to male ratio of 5:1. Among 35 patients, Mean patient age was 30.9 years (Standard Error of Mean is 1.022 and Inter Quartile Range is 9) Toxicity analysis revealed Auramine-O powder in 78% (n=27) of the cases while Malachite

green in 22% (n=08) of the cases.

Time of presentation to the hospital remains crucial in assessing the severity and deciding the outcome of treatment. Fifteen patients presented within 2 hours of poison ingestion while twelve of them presented between 2 to 4 hours of duration. Eight patients were referred late for more than 4 hours. Two patients were brought dead therefore excluded from this study.

Among the cases Clinical features (Table 1) like Jaundice was noted in 60% (n=21) patients. Persistent vomiting in 17.4% (n=06), severe abdominal pain in 20% (n=07), cardiovascular

involvement like palpitations and tachycardia were noted in 8.5% (n=03) each with 1 (2.8%) patient presenting with syncope. low GCS (Glass-Gow Coma Scale) of less than 9 was noted in 14.2% (n=05).

Laboratory analysis revealed (Table 2) liver dysfunction in majority cases in the form of raised bilirubin in 28(80%) cases with elevated liver enzymes in 30(85.7%) cases, renal dysfunction was noted in 14(40%) cases. 9 cases had ECG changes, sinus tachycardia being commonest 8(22.8%) and fatal arrhythmia was seen in 1 (2.8%). Acidosis was seen in 7(20%) on analyzing ABG.

Table 1: Clinical Features in Synthetic Cow-Dung Powder Poisoning

Sl.No	Clinical Features	No. Of Cases	Death (Yes/No)
1	Jaundice	21 (60.0%)	No
2	Vomiting	6 (17.4%)	No
3	Abdominal Pain	7 (20.0%)	No
4	Palpitation	3 (8.5%)	Yes (1/3cases)
5	Syncope Attack	1 (2.8%)	Yes (1/1cases)
6	Tachycardia	3 (8.5%)	No
7	Low GCS Score	5 (14.2%)	Yes (1/5cases)

Table: 2 Laboratory Parameters in Synthetic Cow-Dung Powder Poisoning

Sl. No	Parameter	Total Number Of Cases
1	Liver Function Tests:	
	I. Raised Serum Bilirubin	28 (80.0%)
	Ii. Raised Liver Enzymes(SGOT & SGPT)	30 (85.7%)
2	Renal Function Tests:	
	I. Raised Creatinine Levels	6 (17.14%)
	Ii. Raised Urea-Creatinine Ratio	8 (22.8%)
3	ABG Analysis:	
	I. Reduced PH	7 (20.0%)
	Ii. Reduced Bicarbonate Levels	7 (20.0%)
4	ECG Analysis:	
	I. Sinus Tachycardia	8 (22.8%)
	Ii. Cardiac Arrhythmia	1 (2.8%)

DISCUSSION

Synthetic cow dung powder poisoning has emerged as an important toxicological emergency in rural South India due to its easy availability, low cost, and increasing use for deliberate self-harm [11]. In the

present study, females constituted the majority of cases (82.8%), with a female-to-male ratio of nearly 5:1. Similar female predominance has been reported in earlier studies conducted in southern India, where psychosocial stressors, domestic conflicts, and easy

household access to the poison were considered contributing factors [12]. The mean age of patients in the current study was 30.9 years, indicating that young adults are predominantly affected. This finding is comparable with observations by Krishnamoorthy et al., who reported higher incidence among young individuals in the productive age group [13].

Toxicological analysis in our study revealed Auramine-O poisoning in 78% of cases, whereas Malachite Green poisoning accounted for 22% of cases. Auramine-O is known for its hepatotoxic and neurotoxic effects, while Malachite Green is associated with multiorgan dysfunction and cardiotoxicity [14]. The predominance of Auramine-O poisoning observed in this study correlates with previous reports from rural Karnataka and Tamil Nadu [15].

Time interval between poison ingestion and hospital presentation remains a critical determinant of outcome in poisoning cases. In the present study, most patients presented within four hours of ingestion, while a smaller proportion reached the hospital after four hours. Delayed presentation is associated with increased systemic absorption of toxins and poor prognosis [16]. Early gastric decontamination, aggressive supportive therapy, and timely referral likely contributed to improved survival in patients presenting earlier.

Jaundice was the most common clinical manifestation observed in 60% of patients, reflecting predominant hepatic involvement. Persistent vomiting, abdominal pain, tachycardia, palpitations, syncope, and reduced Glasgow Coma Scale (GCS) scores were other important clinical features noted in the study. Similar findings have been described in previous studies where hepatotoxicity and neurological impairment were major manifestations of synthetic cow dung powder poisoning [17]. Low GCS scores were associated with increased mortality in our study, indicating severe systemic toxicity and central nervous system involvement.

Laboratory evaluation demonstrated significant hepatic dysfunction, with elevated bilirubin levels in 80% and raised liver enzymes in 85.7% of cases. These findings suggest that hepatocellular injury is a major pathological feature of Auramine-O toxicity [18]. Renal dysfunction was observed in 40% of patients, indicating possible nephrotoxic effects or secondary renal injury due to shock and multiorgan dysfunction. Similar hepatic and renal abnormalities have been documented in previous toxicological studies [19].

Electrocardiographic abnormalities were identified in several patients, with sinus tachycardia being the most common finding. One patient developed fatal cardiac arrhythmia, highlighting the cardiotoxic potential of these compounds. Arterial blood gas

analysis revealed metabolic acidosis in 20% of patients, which may be due to tissue hypoxia, circulatory failure, and metabolic derangements caused by severe poisoning [20].

The present study highlights that synthetic cow dung powder poisoning is associated with significant morbidity and mortality due to multiorgan involvement, particularly hepatic, renal, neurological, and cardiovascular dysfunction. Early recognition of toxicity, prompt supportive management, and intensive monitoring are essential for improving patient outcomes. Public awareness regarding the hazardous nature of synthetic cow dung powder and restriction of easy availability may help reduce the incidence of such poisoning cases in rural communities.

CONCLUSION

Synthetic cow dung powder poisoning is an emerging form of toxic exposure predominantly affecting young females in rural communities. The present study demonstrated that Auramine-O was the most commonly implicated toxic component and was associated with significant hepatic, renal, neurological, and cardiovascular involvement. Jaundice, elevated liver enzymes, renal dysfunction, metabolic acidosis, and electrocardiographic abnormalities were common findings among affected patients. Delayed hospital presentation and low Glasgow Coma Scale scores were associated with poor clinical outcomes and increased mortality. Early diagnosis, prompt supportive management, intensive monitoring, and timely referral to higher centers play a crucial role in reducing morbidity and mortality associated with this poisoning. Public awareness regarding the toxic nature of synthetic cow dung powder and strict regulation of its availability may help prevent intentional poisoning and improve community safety.

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