



PROGNOSTIC FACTORS INFLUENCING NEUROLOGICAL OUTCOME AND MORTALITY FOLLOWING SUICIDAL HANGING: A DESCRIPTIVE OBSERVATIONAL STUDY FROM A TERTIARY CARE CENTRE

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ABSTRACT

Background: Suicidal hanging is one of the commonest methods of suicide in India and is associated with considerable mortality and neurological morbidity. Early identification of prognostic indicators may facilitate timely intervention and improve patient outcomes. **Objectives:** To identify prognostic factors associated with neurological outcomes and mortality among patients presenting with suicidal hanging and to evaluate the usefulness of Glasgow Coma Scale (GCS) and quick Sequential Organ Failure Assessment (qSOFA) scores in predicting outcomes. **Methods:** This descriptive observational study included 26 consecutive patients admitted with suicidal hanging to the Emergency Department of S S Institute of Medical Sciences & Research Centre over an 18-month period. Clinical characteristics, laboratory investigations, radiological findings, GCS, qSOFA scores, arterial blood gas (ABG), cardiac investigations, intensive care requirements, neurological outcomes, and mortality were analysed. **Results:** Among the 26 patients, females constituted 53.8% and males 46.2%. Patients younger than 30 years accounted for 61.5% of cases. Overall survival was 88.5%, while mortality was 11.5%. GCS at 48 hours, qSOFA at admission and at 48 hours were significant predictors of mortality. CT brain abnormalities, abnormal ABG at 48 hours, elevated Troponin-I, abnormal echocardiography, and requirement of inotropic support were significantly associated with poor outcomes. The pattern of hanging and presenting symptoms were not significantly associated with mortality. **Conclusion:** Neurological assessment using GCS, qSOFA scoring, CT brain findings, and physiological parameters during the first 48 hours provide valuable prognostic information in suicidal hanging. Early aggressive critical care management may improve survival.

KEYWORDS :

INTRODUCTION

Suicide represents a major public health problem worldwide, with hanging being one of the most frequently employed methods in developing countries, including India. Survivors often present to emergency departments with varying degrees of neurological impairment ranging from transient loss of consciousness to irreversible hypoxic brain injury.

The pathophysiology of hanging involves venous obstruction, arterial occlusion, airway compression, and vagal stimulation, resulting in cerebral hypoxia and neuronal injury. Despite advances in emergency and intensive care, mortality remains high, and predictors of neurological recovery remain inadequately defined.

Several studies have suggested that Glasgow Coma Scale (GCS), hypoxic brain injury, cerebral oedema, and haemodynamic instability influence outcomes. However, evidence from Indian tertiary care centres remains limited.

The present study was undertaken to identify prognostic indicators associated with neurological outcome and mortality in patients admitted following suicidal hanging.

Objectives

Primary Objective

To determine prognostic factors influencing neurological outcomes in patients presenting after suicidal hanging.

Secondary Objectives

- * To evaluate clinical characteristics of suicidal hanging.
- * To assess hospital course and outcomes.
- * To determine the prognostic value of GCS and qSOFA scores.

MATERIALS AND METHODS

Study Design

Descriptive observational study.

Study Setting

Department of Emergency Medicine, S S Institute of Medical Sciences & Research Centre, Davanagere, Karnataka.

Study Duration

January 2025 to May 2025.

Study Population

Twenty-six patients admitted following suicidal hanging.

Inclusion Criteria

- Age > 18 years
- History of suicidal hanging
- Informed consent obtained

Exclusion Criteria

- Patients younger than 18 years

Data Collection

Demographic details, mechanism of hanging, clinical presentation, laboratory investigations, ABG, ECG, Troponin-I, echocardiography, CT brain, cervical spine imaging, GCS and qSOFA scores at admission and 48 hours were recorded.

Neurological outcome, ICU stay, ventilator requirement, inotropic support, and mortality were documented.

Statistical Analysis

- Data were analysed using SPSS version 22.
- Categorical variables were expressed as frequency and percentage.
- Continuous variables were expressed as mean $\pm$ standard deviation.
- Chi-square test was used to assess statistical significance.
- A p-value < 0.05 was considered statistically significant.

RESULTS

		Baseline		Admission at 48HRA		P value			Discharge		Admission at 48HRA		P value
		Count	Rate %	Count	Rate %				Count	Rate %	Count	Rate %	
ABG at Admission	Normal	8	6.0%	8	100.0%	0.230	GCS at 48HRA	Normal	8	6.0%	8	100.0%	0.230
	Abnormal	3	16.7%	19	83.3%			Normal	8	6.0%	3	100.0%	
ABG at 48HRA	Normal	3	4.3%	23	85.7%	0.000*	GCS at 48HRA	Normal	3	20.0%	13	80.0%	
	Abnormal	3	50.0%	2	50.0%			Normal	8	6.0%	18	100.0%	0.001
qSOFA	Normal	8	6.0%	17	100.0%	0.001*	qSOFA at 48HRA	Normal	8	6.0%	8	100.0%	
	Abnormal	3	13.3%	4	40.0%	0.231		Normal	2	100.0%	8	8.0%	0.001*
Chest X Ray	Normal	1	5.0%	16	84.7%	0.231	qSOFA at 48HRA	Normal	1	6.0%	3	100.0%	
	Abnormal	3	33.3%	7	77.8%			Normal	3	30.0%	3	30.0%	
Troponin-I	Normal	8	6.0%	18	100.0%	0.004*	qSOFA at 48HRA	Normal	1	6.0%	17	84.0%	0.004*
	Abnormal	3	27.3%	2	42.9%			Normal	1	6.0%	3	100.0%	
CT Brain	Normal	8	6.0%	18	100.0%	0.002*	qSOFA at 48HRA	Normal	1	6.0%	3	100.0%	
	Abnormal	3	42.9%	4	53.3%			Normal	2	40.0%	3	33.3%	

Twenty-six patients were enrolled.

Females constituted 53.8% while males accounted for 46.2%.

Most patients (61.5%) were younger than 30 years.

Overall, 73.1% demonstrated neurological improvement during hospitalisation.

Twenty patients (76.9%) were discharged, three patients (11.5%) left against medical advice, and three patients (11.5%) died.

Mean admission GCS was 8.92 ± 3.67 , improving significantly to 12.04 ± 3.69 after 48 hours.

GCS at 48 hours showed a significant association with mortality.

Similarly, qSOFA scores at admission and 48 hours were significant predictors of mortality.

CT brain abnormalities including cerebral oedema and hypoxic-ischaemic encephalopathy were associated with poorer outcomes.

Abnormal ABG at 48 hours, elevated Troponin-I, abnormal echocardiography, and requirement of inotropic support demonstrated statistically significant associations with mortality.

Pattern of hanging, presenting symptoms, ventilator requirement, and ICU admission alone did not significantly predict mortality.

DISCUSSION

The present study demonstrates that early neurological assessment remains the cornerstone in predicting outcomes following suicidal hanging.

Improvement in GCS during the first 48 hours strongly correlated with survival, consistent with observations by Renuka et al. and Jawaid et al.

Similarly, qSOFA proved to be an effective bedside prognostic tool, reflecting the impact of systemic hypotension, respiratory compromise, and altered neurological status.

Radiological evidence of cerebral oedema and hypoxic-ischaemic encephalopathy was associated with adverse neurological outcomes, supporting previous findings reported by Matsuyama et al.

Interestingly, cervical spine injury was uncommon, reinforcing earlier reports that routine cervical spine abnormalities are rare in non-judicial hanging.

The study also highlights the prognostic significance of cardiac involvement, particularly abnormal echocardiography and elevated Troponin-I, suggesting myocardial injury secondary to hypoxia.

Strengths

- * Prospective observational design.
- * Comprehensive neurological and physiological assessment.

- * Evaluation of both neurological and mortality outcomes.
- * Inclusion of multiple clinical prognostic indicators.

Limitations

- * Small sample size.
- * Single-centre study.
- * Limited follow-up after discharge.
- * Long-term neurological and cognitive outcomes were not evaluated.

CONCLUSION

Glasgow Coma Scale at admission and particularly after 48 hours remains the most reliable predictor of neurological recovery and mortality following suicidal hanging.

qSOFA, CT brain findings, arterial blood gas analysis, cardiac biomarkers, and requirement of inotropic support provide additional prognostic information.

Early aggressive emergency management and intensive monitoring during the initial 48 hours may substantially improve survival and neurological recovery.

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