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TO STUDY THE PATTERN OF INJURY & OUTCOME INDICATORS IN ATTEMPTED SUICIDAL HANGING PATIENTS PRESENTING TO EMERGENCY DEPARTMENT OF A TERTIARY CARE HOSPITAL

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Abstract

Background: Hanging is a commonly used method for suicide worldwide. Hanging is a form of strangulation in which the body is suspended through the neck and weight of the body act as constricting force. Despite of high mortality and morbidity associated with hanging survival is possible with effective resuscitation and management. In this study we aimed to investigatethe prognostic factors on the survival rate of the hanging patient treated in emergency department and intensive care unit.

Methods: It is a descriptive observational study, which was conducted in the period of January 2021- June 2022 and 26 patients fulfilling the inclusion criterias were enrolled in our study. Patternof injury, clinical presentation, hemodynamic parameters, Q- SOFA scoring, investigation, length of hospital stay, ICU requirements were studied

Results: According to our study 73.1 % patients were survived. GCS after 48hrs, q-SOFA at arrival and after 48hrs are the significant parameters affecting morbidity and mortality. Deranged hemodynamic parameters are also associated with mortality and morbidity. Other significant mortality predictors are CT brain, 2decho, inotropic support. Morbidity prediction was considered according to the ICU admission, length of hospital stay. Type of hanging, leadtime, clinical presentations like irritability & loss of consciousness considered to be of higher morbidity. Cervical spine injury was not found in any of our study groups. Pattern of injury and clinical presentation was evaluated in detail, but both the factors are not a significant outcome predictors.

Conclusions: According to our study early intervention and treatment can reduce both mortality and morbidity. Long term complication was not explained in our study. Even though hanging is one of the most common method of suicide with high fatality, proper management in the ED can significantly improve the outcome of the patient

Keywords: Suicidal hanging, pattern of injury, mortality, morbidity, predictors

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Introduction

In India, hanging is a common method used in suicide attempts, and it is the main cause of suicide fatalities globally. [1] These victims initially present to emergency room (ER) and latershifts to Intensive Care Units for specialized care. [2][3] When pressure exerted on neck by an external force hanging occurs, and further force is increased by the suspended weight of the victim's body. If the knot is placed at the occiput, it is called as typical hanging. When a victim is fully suspended and foot touches the ground it refers to 'complete' hanging whereas 'incomplete' or 'partial' hanging is used for other positions. The severity and occurrence of injuries will depend on the height of the fall, the type and position of the neck ligature, and whether it is complete or partial. [4]. Suicidal hanging will have lower rates of arterial occlusion and the hangman's fracture when compared to judicial hanging due to less height of fall[1][5]. Direct neurological injury, asphyxiation, bradycardia, and cardiac arrest are typically the causes of death. Other serious injuries include fractures of the skull and vertebrae, compression of the cord, trauma to the airway, and occlusion or dissection of the carotid artery. Seizures, cerebral edema, pulmonary edema, acute respiratory distress syndrome, and multi-organ failure are all common clinical manifestations. [1]. Despite the high fatality rate of hanging, survival is possible even after prolonged suspension, and patients who initially survive the attempt are referred to as "near hanging." The compression of low body weight and near- hanging neck structures are the best survival factors. Some factors such as Systolic blood pressure greater than 90, Glasgow coma scale (GCS) greater than 8, anoxic brain injury on CTscan, and Injury Severity Score less than 15 were found to be significantly associated with mortality in near-hanging [6]. In the present study we aimed to investigate the prognostic factors on the survival rate of the hanging patient treated in emergency department and intensive care unit. The aim of this study was to evaluate clinical presentation and outcomes of patients presenting with suicidal hanging in emergency medicine and intensive care unit.

Methodology

A descriptive observational study entitled **"To study the pattern of injury & outcome indicators in attempted suicidal hanging patients presenting to emergency department of a tertiary care hospital."** was undertaken at KIMS hospital, Bangalore after the approval from theInstitutional Ethics Committee.

The study was conducted in the period of January 2021-June 2022 and 26 patients fulfilling the inclusion criterias were included in the study. Written informed consent was taken from those recruited in the study.

Inclusion Criteria:

- Patient admitted to emergency department with history of suicidal hanging.
- Patients age above 16years.
- History of previous suicide attempt.

Exclusion Criteria:

- Age less than 16 years.

Each patient presenting to our ED was evaluated at the time of presentation and detailed history along with clinical examination was performed and later subjected to necessary investigation and emergency required treatment was given to the patient. Information including q-SOFA and GCS at admission and after 48hrs were retrieved from the study participants.

Statistical Analysis

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Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software. Categorical data was represented in the form of Frequencies and proportions.
Chi- square test was used as test of significance for qualitative data. Continuous data was represented as mean and standard deviation. **Normality of the continuous data** was tested by **Kolmogorov–Smirnov test and the Shapiro–Wilk test. Independent t test** was used as test of significance to identify the mean difference between two quantitative variables.
Paired t test was the test of significance for paired data such as before and after surgery for quantitative data.
Graphical representation of data: MS Excel and MS word were used to obtain various types of graphs such as bar diagram.
P value (Probability that the result is true) of <0.05 was considered as statistically significant after assuming all the rules of statistical tests.
Statistical software: MS Excel**,** SPSS version 22 **(**IBM SPSS Statistics, Somers NY, USA)was used to analyze data.

Results

Table 1: Age and Sex distribution

		Count	%
Age	<30 years	16	61.5%
	>30 years...	10	38.5%
Sex	Female	14	53.8%
	Male	12	46.2%

In the study, 61.5% were <30 years and 38.5% were >30 years. 53.8% were Female and 46.2% were Male.

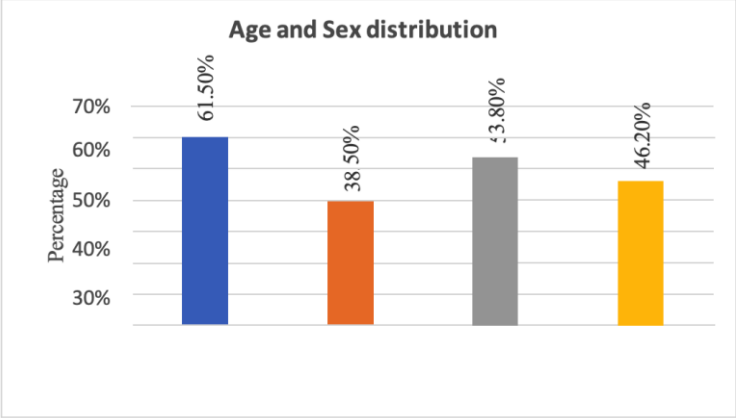

Figure1**: Bar Diagram Showing Age and Sex distribution**

Table 2: Pattern of Hanging

		Count	%
Type of Hanging	Partial Hanging	19	73.1%
	Complete Hanging	7	26.9%
Time of Hanging Witnessed	<5 min	12	46.2%
	>5 min	14	53.8%
Time of Arrival of Hospital	Within 1 hr.	7	26.9%
	After 1 hr.	19	73.1%

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Material used	Rope, wire etc.	14	53.8%
	Saree	12	46.2%

Type of hanging was partial in 73.1% and Complete in 26.9%.

Time of Hanging Witnessed was < 5 min in 46.2% and > 5 min in 53.8%.

Time of Arrival of Hospital was Within 1 hr. in 26.9% and After 1 hr. in 73.1%. Material used was rope, wire in 53.8% and Saree in 46.2%.

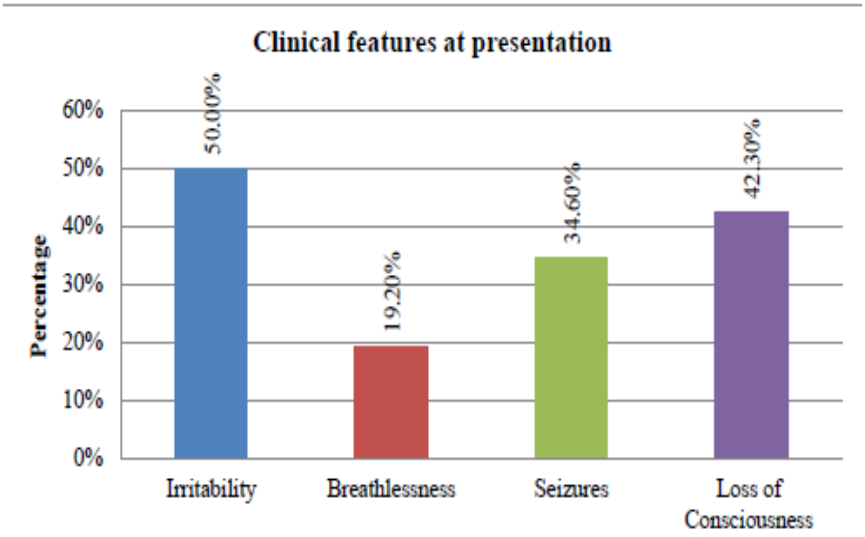

Figure 2: Bar Diagram Showing Clinical features at presentation

Table 3: Past history and substance abuse

		Count	%
Past History	Not Significant	21	80.8%
	Significant	5	19.2%
Substance Abuse	Absent	14	53.8%
	Present	12	46.2%

In the study, Past History was significant in 19.2% and Substance Abuse in 46.2%

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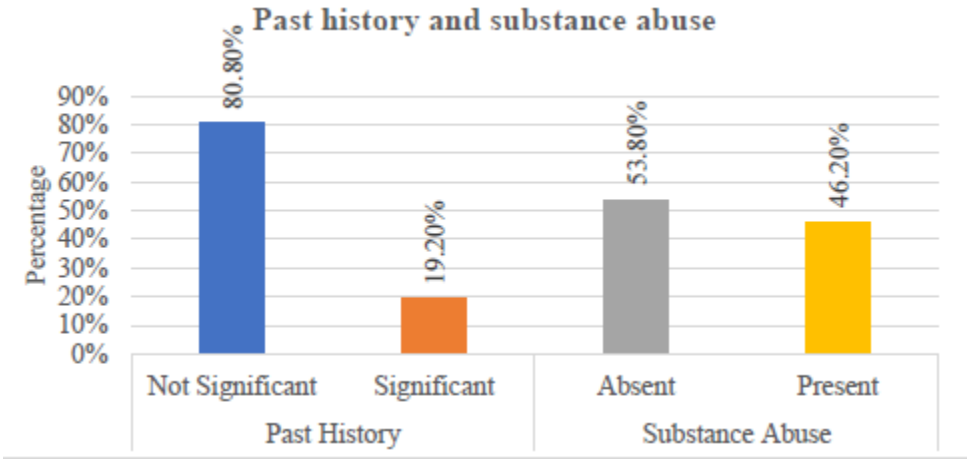

Figure 3: Bar Diagram Showing Past history and substance abuse

Table 4: Mean GCS at arrival and at 48 hrs.

		N	Mean	SD	P value
GCS	GCS Arrival	25	8.92	3.67	<0.001*
	GCS @ 48hrs	25	12.04	3.69	

Paired t test

Mean GCS at Arrival was 8.92 ± 3.67 and GCS at 48hrs was 12.04 ± 3.69.
There was a significant increase in mean GCS at 48 hrs. compared to GCS at arrival

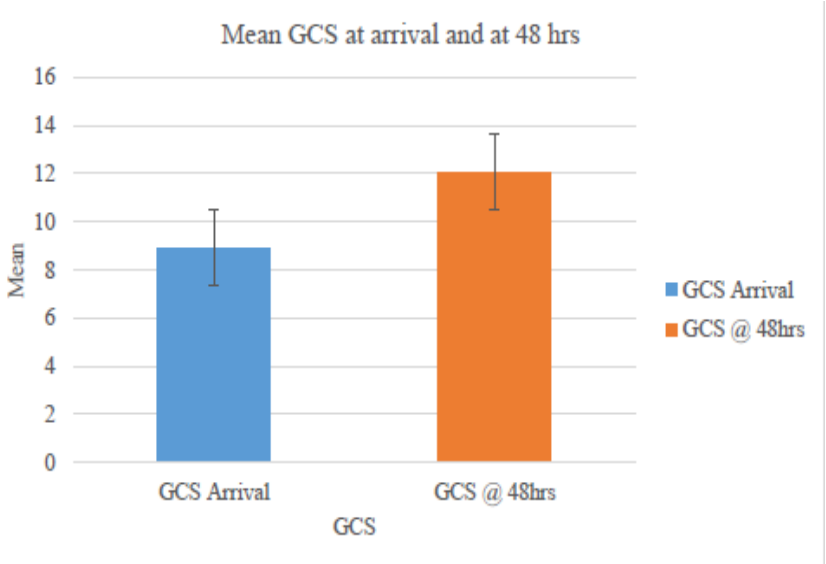

Figure 4: Line Diagram Showing Mean GCS at arrival and at 48 hrs

Table 5: Vitals at presentation

	Mean	SD	Median
PR (bpm)	112.73	26.51	111
RR (cpm)	25.04	7.01	24
SPO2 %	92.64	13.42	99
GRBS mg/dl	150.88	63.78	127

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Vitals at Presentation, PR (bpm) was 112.73 ± 26.51, RR (cpm) was 25.04 ± 7.01, SPO2 % was 92.64 ± 13.42 and GRBS mg/dl was 150.88 ± 63.78.

Discussion

In our study, 26 cases of suicidal hanging were selected and clinically evaluated during a period of 2 years. Statistical data of age, gender, various etiologies, acute presentations, hemodynamic parameters, disposition along with their outcomes were studied**.** The patient's mortality was the main result under investigation, while morbidity was the secondary outcome.

According to the study, 61.5% of the patients were young (age less than 30years) with a female predominance of 53.8%. Patients were evaluated with various parameters as a predictor for morbidity and mortality. Morbidity parameters taken in the study are ICU requirements and number of stay in the hospital, whereas long term complications were not assessed. Penney et al. found that 90% of patients who arrived alive had low incidences of poor neurological outcomes, therefore vigorous resuscitation and care was appropriate. Similar findings came from our study, where roughly 85% of patients had a favorable prognosis.

According to our study age, sex, type of hanging, time of hanging witnessed, time of arrival of hospital, materials for hanging is not a significant predictor of mortality and morbidity. Whereas partial hanging and time of hanging witnessed less than 5mins are of with reduced mortality. Pattern of hanging was evaluated with type of hanging, time taken to reach hospital (lead time), material used, time of hanging witnessed, these are not statistically significant factors, but partial hanging and lower lead time is of good outcome. [1] Hypotension is a significant factor for mortality with a p value of 0.022, similar results were obtained by Karanth et al. Tachypnea is also very crucial factor for mortality with strongest association of 95.8%. Hypoglycemia is another important factor of mortality with a p value of 0.01. GCS at 48hrs are of significant mortality predictor with a p value of < 0.001. According to Penney et al GCS at arrival is a significant mortality predictor whereas in our GCS at arrival alone is not a significant factor for mortality. According to our study, GCS at 48 hours is more relevant than GCS at admission, contrary to Renuka et al findings, where GCS at arrival is more important. Q-SOFA at arrival and after 48hrs are significant mortality predictor, among that q-SOFA at 48hrs have higher mortality with p value of 0.006 compared to q-SOFA at arrival which is 0.01. In Matsuyama et al ABG at arrival was a significant outcome predictor, but in our study ABG at 48hrs is a significant association with mortality (p value 0.009). 2d-echo & trop-I are important factors associated with mortality. CT brain is a significant mortality predictor with a p value of 0.002, C-spine screening was insignificant according to our study. In Penney et al Cervical spine injury is statistically insignificant but needs to be considered and taken care for unexpected thoracic injuries, similar results were noted in our study. Inotropic support was significant mortality predictor, with a p value of < 0.001. ICU admission is not a significant factor of death. Past history, substance abuse, clinical presentation are of no significance in mortality.

Conclusion

Our study concluded that the early and prompt intervention can prevent the mortality and mortality of suicidal hanging inspite of its severe fatality. GCS after 48hrs is a significant predictor of both morbidity and mortality, can also explained about the neurological prognosis. Q-SOFA scoring at arrival and after 48hrs is also a significant factor for both morbidity and mortality. Factors like pattern of injury, lead time, type of hanging, material of hanging are of not much importance. Even though early decreased lead time and partial hanging are associated

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with decreased mortality. Complications like hypoxic ischemic encephalopathy, pulmonary edema, aspiration pneumonia are common, but early intervention can prevent them.

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