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A Prospective Observational Study, Clinical Prsentation of Attempted Hanging Cases to Emergency Department, Assess and Correlate Initial Clinical Profile of Patient With the Outcome and Length of Hospital Stay

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Abstract

Introduction: Suicide is also the second most common cause of injury related death after road traffic injuries. Aim of the present study was to find out the influence of admission clinical variables on outcome of patients admitted to emergency room (ER) with attempted hanging.

Material and Methods: A prospective observational study on patients presenting to emergency medicine department with history of attempted hanging and admitting under ICU/emergency medicine wards of SDM Medical college and Hospital, Dharwad. Study duration were about two years. Patients with >18 years of age with history of attempted hanging presenting to ED were included in our study Patients with GCS of 3/15 with bilateral dilated and non-reactive pupils and patients with history of attempted hanging and already diagnosed with hypoxic brain injury were excluded.

Results: Out of 50, 27 were male and 23 were female with more cases in age group between 21-30 years. Time since incidence was one of the parameter influencing on duration of stay in hospital, which was more in 11 patients who presented after 6 hrs of incidence. 30 patients presented with GCS of less than 8 and all these were intubated. This is most significant parameter to predict duration of hospital stay. Majority of patients had hyperglycemia but that did not influence much on patients stay in hospital. 35 cases had GRBS more than 126mg/dl at the time of presentation. All patients underwent CT Brain with C-spine scan which revealed abnormality in 15 cases. These patients also had more number of hospital stay than compared with normal scan finding cases.

Conclusion: In our study it has been evident that presenting clinical parameters including vital status of the victim, level of sensorium/ severity of brain Injury, non-modifiable factors such as age and initial CT scan findings will guide an emergency physician to explaining prognosis in a case of attempted hanging.

Keywords: Hanging; Suicide; Vitals; Outcome; Risk factors.

Introduction

Health and psychological issues related to suicidal behaviour affect people in both developed and developing countries a like. Suicide is also the second most common cause of injury related death after road traffic injuries.[1]

There has been a worldwide increase in the number of people taking their own lives, particularly among young people. Hanging is the second most common method of suicide in India, after poisoning.[2] Those who have been hanged often end up in emergency rooms, where they require specialised care in intensive care units. In the medical literature, there is very little information about suicidal hanging, which is unfortunate. Only a small number of studies have been published about the clinical aspects of the problem and the means of prognostication that can be used by the clinician.[3] At the same time, the evidence linking suicidal hanging patients' prognosis to risk factors is scant. There is a possibility that risk stratification and prognostication can be done more precisely by studying various risk factors and their relationship with outcome. As a result, it's possible that various tactics for enhancing the result can be derived.[4]

The vertebral artery and the common carotid artery narrow during a hanging episode, causing a blockage of blood flow.[5] Oxygen and glucose requirements increase as a result. Study participants included people who had been admitted to our emergency department after a failed attempt at suicide by hanging.[6,7]

Aim of the present study was to find out the influence of admission clinical variables on outcome of patients admitted to emergency room (ER) with attempted hanging.

Material and Methods

A prospective observational study on patients presenting to emergency medicine department with history of attempted hanging and admitting under ICU/emergency medicine wards of SDM Medical college and Hospital, Dharwad. Study duration were about two years. Patients with >18years of age with history of attempted hanging presenting to ED were included in our study Patients with GCS of 3/15 with bilateral dilated and non-reactive pupils and patients with history of attempted hanging and already diagnosed with hypoxic brain injury were excluded.

Results

Fifty attempted cases of hanging presented to emergency department of SDM Medical college & Hospital and admitted in intensive care unit, emergency ward were studied.

In the present study of 50 cases, 27 cases were males and 23 were females. Distribution across various age groups from 18 to 70 years of age as depicted in the Table 1 shows young adults between 21-30 years of age were 40% and 31-40 years of age were 26% constituted maximum number of cases. Time of incidence to presentation, to a tertiary care level hospital will be varied due to various reasons such as health care transportation system of the location, time of incident and accessibility to hospitals.In our study it has been observed that time since injury to presentation to our ED varies from 1 hour to 12 hours. In our study we classified the severity of brain injury based on Glasgow coma scale at the time of presentation. GCS was assessed by the ER resident doctor and severity was graded as mild (GCS 13-15), moderate (GCS 9-12) and severe (GCS<=8). In patients with GCS of <=8 were intubated in view of maintaining airway patency in emergency room and shifted to intensive care unit for further management. In emergency room total 30 out of 50 patients were intubated which constitutes to 60% of total cases of attempted hanging.

Outcome across various presenting clinical features were assessed based on number of days of intubation and total days of hospital stay in hospital in terms of mean ± standard deviation (Table 2). Out of total 50 patients presented to ED, Heart rate varied from 66bpm to 148bpm with mean of 111.6 and standard deviation of 21.2bpm. Systolic BP ranged from 80 mmHg to 160 mmHg with mean of 114.2±20.5 mmHg. Patients respiratory rate ranged from 16cpm to 44cpm with mean and standard deviation 32±6.8cpm. Patients had blood glucose levels checked in ED which varied from 86 mg/dl to 322 mg/dl with an average of 236±156.02 mg/dl. Out of 50 patients, number of days of intubation was upto 5 days with mean of 1.76±1.7 days. And days of hospital stay was ranging from minimum of 1day to maximum of 8 days with mean duration of stay of 3.76±1.99 days.

Out of 50 cases of attempted hanging cases 27 were male patients, who stayed in hospital for average period of 3.5±1.9 days and were intubated for mean duration of 1.6 ± 1.5 days (Table 3). In case of females mean duration of stay in hospital was 4.1± 2.1 days and average period of intubation was 2 ± 1.8 days. Male patients presented to ED were 27, out of which 15 were intubated where as in case of female out of 23, 15 were intubated.In our study, we

Table 1: Distribution of study parameters among the study participants (N=50)

Sl. no	Variable	Frequency	Percentage
1	**Gender**		
	Male	27	54
	Female	23	46
2	**Age**		
	<20	7	14
	21-30	20	40
	31-40	13	26
	41-50	5	10
	51-60	4	8
	61-70	1	2
3	**Distribution of Time since Incidence**		
	1-5 hrs		
	6-12 hrs	39	
		11	
4	**Clinical features**		
	LOC>5min	38	
	Seizures	1	
5	**GCS at time of presentation**		
	≤ 8	30	60
	9-Dec	3	6
	13-15	17	34
6	**Intubation**		
	Yes	30	60
	No	20	40

Table 2: Various parameters with their Mean and Standard deviation.

Sl. no.	Parameters	Minimum	Maximum	Range	Mean	Std. Deviation
1	Age in years	18	70	52	32.34	11.95
2	Heart rate	66	148	82	111.68	21.22
3	Systolic blood pressure	80	160	80	114.2	20.51
4	Diastolic blood pressure	50	100	50	72.2	12.82
5	Respiratory rate	16	44	28	32.14	6.85
6	SP02	66	98	32	84.02	8.37
7	Glasgow coma scale	4	15	11	9.18	4.04
8	Pupil size in mm	2	4	2	3.48	0.57
9	GRBS	86	322	236	156.02	48.86
10	Days of intubation	0	5	5	1.76	1.75
11	Days of admission	1	8	7	3.76	1.99

Table 3: Mean and Standard Deviation of Intubation and Hospital stay based on gender

Sl. no	Variable	N	Days of Intubation	Days of Hospital stay
1	**Gender**			
	Male	27	1.6 ± 1.5	3.5 ± 1.9
	Female	23	2 ± 8	4.1 ± 2.1
2	**Age**			
	<20	7	2.4 ±2.1	4.4 ± 2.6
	21-30	20	1.6 ±1.5	3.5 ± 1.7
	31-40	13	1.9 ± 1.8	3.9 ± 2.2
	41-50	5	2 ± 1.6	3.8 ± 2.2
	51-60	4	2.3 ± 1.7	4.3 ± 2.1
	61-70	1	–	
3	**Distribution of Time since Incidence**			
	1-5 hrs	39	1.4 ± 1.5	3.4 ± 1.9
	6-12 hrs	11	3 ± 1.8	5.1 ± 1.9
4	**Clinical features**			
	LOC>5min	38	2.3 ± 1.7	4.4 ± 1.9
	LOC <5 min	12	–	1.8 ± 0.6
5	**Intubation**			
	≤ 8	30	2.9 ± 1.3	4.9 ± 1.6
	9-Dec	3	–	3 ± 1
	13-15	17	–	1.8 ± 0.4
6	**Tachycardia**			
	HR >100	35	1.9 ± 1.8	4.1 ± 2
	HR <100	15	1.6 ± 1.6	3.2 ± 1.9
7	**Hypotension**			
	SBP≤ 90	9	3.8 ± 0.9	6.2 ± 1.4
	SBP> 90	41	1.4 ± 1.5	3.2 ± 1.7
8	**Tachypnea**			
	RR >20	43	2.1 ± 1.7	4.1 ± 1.9
	RR ≤ 20	7	–	1.5 ± 0.5
9	**Hypoxia**			
	SPO_2 ≤94	44	2 ± 1.7	4.1 ± 1.9
	SPO_2 >94	6	–	1.5 ± 0.6
10	**Pupil size in mm**			
	2	2	–	2
	3	22	0.5 ± 0.8	2.4 ± 1
	4	26	3 ± 1.5	5 ± 1.8

11	**Pupillary reaction**			
	Reactive	45	1.4 ± 1.5	3.4 ± 1.7
	Non-reactive	5	4.6 ± 0.6	7.2 ± 0.5
12	**Hyperglycaemia**			
	GRBS >126	35	1.9 ± 1.7	4 ± 1.9
	GRBS ≤ 125	15	1.3 ± 1.6	3.2 ± 2

noted that patient aged <20 stayed in hospital for 4.4 ± 2.6 and with age group of 51-60 stayed for 4.3 ± 2.1. In our study, 39 patients presented to ED with in 5 hours were intubated for 1.4 ± 1.5 days and stayed for 3.4 ± 1.9 days. Rest 11 patients who presented from 6-12 hours of duration were intubated for 3 ± 1.8 days and stayed for 5.1 ± 1.9 days Patients with loss of consciousness for >5 minutes were 38 and all were intubated, stayed in hospital for a mean of 4.4 ± 1.9 days and were intubated for 2.3 ± 1.7days. GCS at the time of presentation was an important factor for the prognosis. GCS with <=8 were 30 and all were intubated. These patients had mean Intubation days of 2.9 ± 1.3 and stayed in hospital for 4.9 ± 1.6 days. GCS of 9-12 were 3 and stayed for 3 ± 1 days and of 13-15 were 17 in number, stayed for 1.8 ± 0.4 days.In our study, 35 patients had tachycardia, stayed in hospital for a mean period of 4.1 ± 2 days and 1.9 ± 1.8 days of intubation. Others stayed for 3.2 ± 1.9 days in hospital with 1.6 ± 1.6 days of intubation.In our study, 9 patients had hypotension stayed in hospital for 6.2 ± 1.4 days with 3.8 ± 0.9 days of intubation. Other 41 patients were normotensive and stayed for 3.2 ± 1.7 days with 1.4 ± 1.5 days of intubation. In our study, 2 patients had 2mm of pupil size and they stayed for 2 days. While 22 had 3mm pupil size stayed for 2.4 ± 1days with 0.5 ± 0.8 days of intubation. 26 patients had 4mm size and stayed in hospital for 5 ± 1.8days with 3 ± 1.5 days of intubation. 45 patients had pupillary reaction to light, who stayed for 3.4 ± 1.7 days in hospital and 1.4 ± 1.5days on ventilator. And other 5 patients had non-reactive pupils stayed for 7.2 ± 0.5days in hospital and 4.6 ± 0.6 days on ventilator.

Out of 50 patients 35 had normal CT Brain plain with cervical spine screening. They were intubated for 1.3 ± 1.5 days and 3.2 ± 1.7 days of hospital stay. Other 15 patients had abnormal CT findings, intubated for 2.9 ± 1.6 days and 5.1 ± 1.9 days of hospital stay. Abnormal findings include cerebral oedema, Temporo-mandibular subluxation, Hyoid bone fracture, Vertebrae fracture (Figure 1).

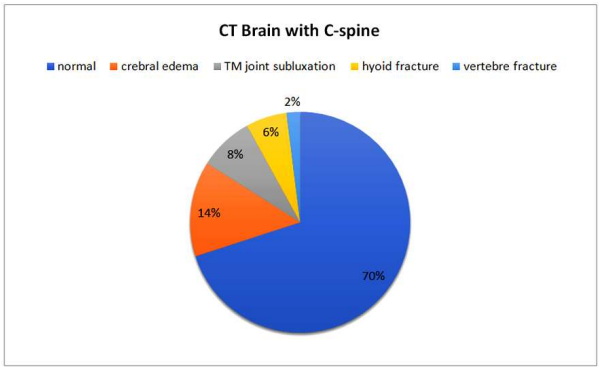

Fig. 1: Distribution of CT scan with C-Spine

Discussion

50 cases of attempted hanging presented to emergency department of SDM Medical college & Hospital and admitted in emergency ward and intensive care unit were included in our present study and results obtained on the basis of outcome assessment in terms of various initial clinical presentations and length of hospital stay.

Hanging is one of the most common methods of suicide in India in which death of the individual occurs almost immediately. Hanging was the most frequently reported method of suicide in most of the studies. Attempted hanging is most common in adult males as concluded in most of the past studies. In our study 54% were male and 46% were female. We included age group between 18-70 years, it is observed that most common age group belongs to 21-30 years. Soman et al., concluded hanging cases were shown bimodal peaks at 15-35 yrs and 55-74 yrs in the year 2007.[8] Sauvaget et al., in 2009 Thiruvananthapuram, Kerala concluded that tendency was more among adults 35- 90 years of age. Out of which age group of <20 and 51-60 were 7 and 4 respectively, who stayed for more days in hospital than compared to any other age group patients.[9]

In our study 38 patients had loss of consciousness for more than 5 minutes as witnessed by the informant. These patients had more number of days of intubation and hospital stay than compared to patients who dint had loss of consciousness. In a case of attempted hanging early diagnosis and timely intervention plays major role in outcome. In

a developing country like India where the quality of pre-hospital care and immediate transportation of victims to hospital with particular facilities for treatment is still needs more attention.[10] Thus a time since incident to definitive care for the victims depends on pre-hospital care, ambulance facility of that particular region, time at which an incident happens, availability of emergency medical service and hospital which would provide definitive care. Thus in our study we have noticed that time since incidence to the hospital visit to our ED was included varying from 1 hour to 12 hours. Patients who presented to ED within 6 hours of incidence stayed for short duration than compared to patients who presented after 6 hours.

In a case of attempted hanging severity of brain injury has to be graded, which helps in the management.[11] Brain injury classified as mild, moderate and severe based on GCS at the time of presentation. In our study GCS was assessed by the emergency resident who receives the patient. GCS is a subjective qualitative score which will always have inter observers variations. In our study out of 50 cases 34% were mild, 6% moderate and 60% were severe brain injury. Patients with GCS less than 8 were all intubated and stayed in hospital for more duration than patients presented with GCS of more than 8. Matsuyama et.al concluded that presence of cardio-pulmonary arrest at scene and GCS on arrival represented prognostic factors of outcome in hanging in 2014.[12] Ganeshan R et. al in 2016 concluded that GCS <8 can be considered as risk factors for poor outcome and adverse outcome.[13] Penny et.al GCS at scene and on admission to hospital is a poor prognostic indicator of outcome in 2002.[14]

Most of the studies showed that patients presenting to ED, blood pressure as an important prognostic factor in TBI. In our study hypotension was present in 9 out of 50 cases. And patients having hypotension stayed for more in hospital and also days of intubation were more than compared to normotensive patients. Ganeshan R et.al concluded that MAP <60 can be considered as risk factors for poor outcome and adverse outcome in 2016.[13] While tachycardia was present in most of the cases in our study i.e., 35 but there was no significant outcome than compared with normal heart rate patients. Hypoxia due to any reason will be detrimental to brain tissue. Secondary Insult to the brain tissue due to hypoxia depends on magnitude of hypoxia and duration. In our study 7 out of 50 patients did not had tachypnea who were not intubated and stayed in hospital for less duration than compared to 43 patients with tachypnea. And 44 patients had hypoxia at the time of presentation to ED whose length of stay was more than compared to normally maintaining patients.

Abnormalities in pupillary reflex will be of at most significant parameter in prognostication of brain injury. In our study pupillary reaction to light was noted in primary survey as a part of disability. In our study pupillary reaction was absent in 5 patients as compared to 45 reactive to light, who had more days of intubation as well as length of stay in hospital. And also pupil size of 4 mm patients stayed more days in hospital than compared to patients with pupils of 3 mm and 2 mm. Hyperglycaemia has also shown to have prognostic significance in brain injury. Ganeshan R et. al in 2016 concluded that CBG >180 mg% can be considered as risk factors for poor outcome in attempted hanging. In our study 35 patients had hyperglycaemia, whose length of stay in hospital almost similar to normoglycaemic patients.[13]

All 50 cases of attempted hanging were stabilised in ED and then got CT Brain with Cervical spine screening. Some studies mention that no need of cervical spine screening in all cases. In the year 2017, Jawaid et. al concluded that majority of cases of hanging recovered without any sequelae, routine imaging of cervical spine may not be needed in all patients.[14] Out of 50 cases 15 had abnormal findings in CT scan. These 15 cases had stayed in hospital for more days than patients with normal scan.

Conclusion

Hanging is considered one of the commonest ways of committing suicide next only to poisoning in India. Hanging victims present to emergency department of hospitals and most of them need specialized care in intensive care units. Most of the cases presented were of adolescent age group with slight male preponderance. The majority of cases had loss of consciousness for more than 5minutes and were presented within 6hour of incidence. Patients were irritable at the time of presentation with most presented GCS less than 8 who were all intubated in view of non-patent airway. Majority of cases had respiratory distress with tachypnea and hypoxia. These all above mentioned parameters influenced on length of intubation and hospital stay.

In Emergency department explaining the prognosis of a case of attempted hanging to the patient's relatives/patient is of at most important and difficult issue. Predicting the functional

outcome of an attempted hanging patient needs special attention. One should consider multiple vital parameters at presentation and initial CT scan findings to prognosticate Brain Injury. In our study it has been evident that presenting clinical parameters including vital status of the victim, level of sensorium/ severity of Brain Injury, non-modifiable factors such as age and initial CT scan findings will guide an emergency physician to explaining prognosis in a case of attempted hanging. These parameters are of prognostic values when they are taken individually or collectively as variable for prognostication of hanging victim.

Thus we propose multiple significant factors for attempted hanging in Emergency department:

1. Age.
2. Time since incidence.
3. Presenting vitals like Blood pressure.
4. Hypoxia at presentation.
5. Glasgow coma scale for level of consciousness.
6. Pupillary reflex after stabilizing the patient's vitals.
7. Initial CT Brain with C-spine scan findings.

In a developing country like India wherein the pre-hospital emergency care facilities are at the introductory phase in transportation of a victim, availability of primary care and time delay in getting a definitive care also alters the prognosis of the patient. We also propose the need for emergency medical service, primary level trauma care facilities, and improvement in ambulance facilities to prevent the secondary insults to brain.

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