Vital Role of Early Intervention in Saving Lives of Near-Hanging Victims; A Case Series From Rural India With Review of The Literature

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Abstract: Hanging is a form of asphyxia death due to constriction of the air passage at the neck, as a result of suspension of the body by a ligature in the form of a noose, applied in such a manner when weight of the body acts as a constricting force. Here we present three cases of suicidal hangings that presented to us in poor clinical state and required immediate intubation, assisted ventilation and intensive care treatment. Injury to the cervical spine was absent but MRI revealed hypoxic ischemic changes in brain in two victims. All patients were given standard intensive care and neuroprotective medications and made great recuperation. Prompt resuscitation, active interventions and intensive care support favours good prognosis in near hanging cases.[Archana V SEAJCRR 2017; 7(4):21-25]

Key Words: Early Intervention; near hanging; suicide; cerebral hypoxia; rural; India

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Introduction: Suicide by hanging is the act of intentionally killing oneself via suspension from an anchor-point or ligature point (e.g. an overhead beam or hook) by a ligature or by jumping from a height with a noose around the neck.

Hanging is often considered to be a simple suicide method that does not require complicated techniques. It is one of the most commonly used suicide methods and has a high mortality rate; Gunnell et al. gives a figure of at least 70 percent[1].

Near hanging is a term used to refer to patients who survive a hanging injury long enough to reach hospital, irrespective of its manner, whether it is accidental or suicidal. This term is analogous to "near drowning" that describes victims who survive drowning[2]. In this report we present three cases of near hanging who presented in a grave clinical condition timely aggressive management had saved their lives. To the best of author's knowledge this is the first report from rural India.

Case 1 : A 30 years old married male plumber by occupation was found hanging in his bed room; using his wife's saree from ceiling fan and door was locked. He came in night after heavy consumption of alcoholic drink and had a hot discussion with family members. Later on, he went to his room and hanged himself. The hanging was incomplete the other side of the ligature was fixed to the ceiling fan knob as stated by his wife and feet were touching the ground .It took approximately 10-minutes by the family members to rescue him. Attendants rushed to the nearby health centre from where he was referred to our hospital.

He was bought to our emergency department in 4 hours. External examination showed a ligature mark of 1.5 cm wide and was incomplete. Any other traumatic lesion/injury, particularly defence wounds was not observed. On arrival he was unconscious and Glasgow coma scale (GCS) score of E2V1M2. His respiratory rate (RR) was 35/min, arterial oxygen saturation (SPO_2) on room air 50%, pupils dilated bilaterally and reacting sluggishly to light and rest of vital were within normal limit. There was no sub-conjunctival hemorrhage. Bilateral crepitations were present on chest auscultation. After securing intravenous access he was kept on ventilator for 10 days. He regained consciousness after one week and was gradually weaned off from assisted ventilation. Tracheotomy closure was done on 20th day.

Chest and cervical spine X-rays were performed at bedside and were within normal limit. MRI scan of

neck and head was done after the patient was stabilized and MRI cervical spine was normal and brain showed sub acute non hemorrhagic infarct in left occipito- temporal and right cerebellar region (Figure 1,2). All biochemical, hematological investigations were within normal limit. He was managed on conservative line with antibiotics and neuroprotective drugs.

After three months there was a significant improvement in his clinical condition .On neurological examination, his higher mental functions and cranial nerves were normal. There was no sensory deficit and muscle power was normal. He had right sided cerebellar signs in the form of hypotonia of right upper and lower limbs, nystagmus, dysdiadochokinesia, and finger-nose and heel-knee in coordination.

Case 2: A 30 years old married male; farmer by occupation and known alcoholic was found hanging in his farm from a tree by using saree in the morning .The feet were not touching the soil. This place was near one of public school and students rescued him in about 5 minutes and informed his family. He took alcohol in the morning with his friends and relatives and went to his farm and hanged himself.

He was bought to our emergency department within 2 hours. On external examination incomplete ligature mark of 0.5 to 0.7 cm wide, in front of the thyroid cartilage was seen. On arrival he was thermodynamically stable but unconscious with a Glasgow coma scale (GCS) score of E1V1M1. On 2nd day he developed respiratory distress and was incubated and put on ventilatory support in ICU with maintenance of normoxia, normocarbia, euglycemia, normovolemia and normal electrolytes. Later tracheotomy was done. He regained consciousness after 72 hours and was weaned off from support after 15 days and tracheotomy closure was done after one month due to repeated respiratory distress on partial closure. Chest and cervical spine X-rays, including MRI brain and cervical spine were normal.

After one month he was discharged without any neurological deficit.

Case 3: A 25 years old male was discovered hanging from the tree (*Neem*) in his home garden by using duppatta in the evening. Height of tree was 10 feet; legs were not touching the soil. He was reused by his brother after 7 minutes. He was unconscious and there was frothing from angle of mouth and tonic–clonic movement of left upper and lower limb was also noted which lasted for 2-3 minutes.

He was bought to our emergency department in 5 hours. External examination showed a ligature mark of which was, incomplete. On arrival he was unconscious and Glasgow coma scale (GCS) score of E2V1M3, he was hemodynamic ally stable and with oxygen saturation of 60%. Scattered coarse crepitations were present on chest auscultation. He was put on oxygen inhalation, antibiotics and antiepileptic drugs He gradually regained consciousness after 15 days.

MRI cervical spine was normal.MRI brain showed extensive area of restricted diffusion involving cortical and sub cortical area of both hemispheres suggestive of hypoxic ischemic encephalopathy. (Figure 3)

After three months there was marked recovery and was able to walk without support and had a mild degree of generalized cognitive impairment predominately recent memory impairment. On examination he showed marked verbal and nonverbal memory deficit retrieval was more impaired than storage. Memory for newly learned information was significantly impaired. His attention and concentration were in place. Language, somatosensory, visualspatial, constructional, abstracting was intact.

All the three patients received DVT prophylaxis, bowel bladder and back care, passive limb physiotherapy and lower limb physiotherapy by robotic machine and enteral feeding with naso-

gastric tube. Psychiatric reference and counseling was done in all the three cases for her irritable behavior and depressive symptoms. After talking to the patient as well as their relatives, this unfortunate incidence was found to be purely suicidal in nature. All the legal protocols were done as per the institutional rules.

Discussion: Suicide is a serious public health problem; however, suicides are preventable with timely, evidence-based and often low-cost interventions. More than 800 000 people die by suicide every year i.e. around one person in every 40 seconds, according to WHO's first global report on suicide prevention. Suicide is the second leading cause of death among 15–29-year-olds.75% of global suicides occurs in low- and middle-income countries. Ingestion of pesticide, hanging and firearms are among the most common methods of suicide globally. Suicide accounted for 1.4% of all deaths worldwide, making it the 15th leading cause of death in 2012 [3].

Hanging is a commonly preferred method for committing suicide. The materials necessary for suicide by hanging are readily available to the average person, compared with firearms or poisons.

In Canada, hanging is the most common method of suicide, [4] and in the U.S., hanging is the second most common method, after self-inflicted gunshot wounds. [5] In the United Kingdom, where firearms are less easily available, in 2001 hanging was the most common method among men and the second most commonplace among women (after poisoning). [6]

In India, hanging is second common method of committing suicide after poisoning. Over the past 30 years the incidence of suicide by hanging is on increase, especially among young adults [7]. The fact that 71% of suicides in India are by persons below the age of 44 years imposes a huge social, emotional and economic burden to our society [8]. There is paucity in literature about the management and outcome of patients of near hanging from India, only few case series has been reported from metropolitan cities [9-12] but none from rural part of India, as we presented here.

In hanging the morbidity and mortality occur due to number of reasons like venous obstruction leading to cerebral hypoxia, laryngeal edema and delayed airway obstruction, increased vagal tone, injury of neck structures (thyroid cartilage/hyoid bone fracture/laryngeal rupture) pulmonary complications (aspiration pneumonia, development of adult respiratory distress syndrome, pulmonary oedema secondary to negative intrathoracic pressure due to attempted inspiration in upper airway obstruction or centrally mediated sympathetic discharge leading to generalized vasoconstriction), subarachnoid hemorrhage, hyperthermia and status epileptics.[13]

Those who survive a suicide-via-hanging attempt, whether due to breakage of the cord or ligature point, or being discovered and cut down, face a range of serious injuries, including cerebral anoxia—which can lead to permanent brain damage, laryngeal fracture, cervical spine fracture—which may cause paralysis, tracheal fracture, pharyngeal laceration, and carotid artery injury. [14]

People who attempt hanging as a means of suicide are young and healthy individuals. Mortality is high and number of victims is already dead when discovered and the only few who make it to hospital represents a group that needs skillful medical management. Albeit 80% survive [2] the plausibility of permanent neurological damage [15] or delayed neuropsychiatric sequelae [16] among survivors remains a result dreaded more than death itself. Delay in presentation of 4 hours or more after the episode is connected with higher chances of a poor result (death or incomplete neurological recovery). [12] The extension of the hanging period increases brain damage by increasing the duration and degree of anoxia and it also increases the likelihood of injury

to the neck structures. It has been demonstrated that there is less mortality if time of hanging is under 5 minutes the critical threshold for hanging. Nonetheless, mortality was expanding fundamentally in cases hanging period was more than 30 min [12].

In all hanging related studies, initial GCS score had been fundamentally evaluated regarding the mortality and morbidity. However, even with a GCS less than 7, mortality was established maximally upto 30% [12, 22, 19]. Matsuyama et al. [20] reported that cardiopulmonary arrest, GCS on arrival and hanging time was related with the prognosis. However, in a study comprising of 47 patients, survival was reported in 50% of the patients who had GCS>3 survived. Penny et al. [19] also noted that the presence of cardiac arrest and low GCS were main prognostic factors. Subsequently, it might be said that cardiac arrest adversely affects the outcome.

Hanging time was less than 10 minutes in our three patients, they reached hospital within 5 hours and their GCS was <7 but early and appropriately directed care and meticulous management has given them good neurological recovery.

Several other factors also affect survival like, early resuscitive measures, force applied for compression of neck [21], point of suspension (around the neck), drop force, totality of hanging (suspension in air or not) [12] and the time of releasing the liagature [22] may have a bearing on prognosis. State of narcosis and drunkenness as well as extremes of ages, physical infirmity and associated cardio-respiratory ailments will considerably affect the prognosis adversely. Incomplete encirclation of neck by ligature and partial hanging was also attributed for minimizing the hypoxic-ischemic damage to the brain [23].
Our patients were rushed to the hospital as early as possible; although their GCS were low and MRI brain showed hypoxic changes all the three lives were saved. One patient recovered completely and other two survived with minimal neurological deficit. Early and aggressive management in patients of near hanging can be rewarding. Psychiatric assessment and treatment is the key in averting such attempts in future.

Conclusion: We conclude that aggressive resuscitation and treatment of postanoxic brain injury is indicated, as full recovery may still occur. Patients of near hanging ought to be instantly and aggressively managed regardless of dreary starting presentation. Aggressive resuscitation and management should be performed for all patients who arrive with signs of life. Studies with larger numbers and detailed functional outcomes are needed.

Legends:

Figure 1,2 FLAIR image of MRI brain revealing sub acute non hemorrhagic left occipito temporal and right cerebellar infarct.

Figure 3: MRI brain revealing restricted diffusion involving cortical and sub cortical area of both hemispheres.

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