



Clinical predictors and outcome of patients of acute stroke requiring ventilatory support: A prospective hospital based cohort study



Priya Gupta, Kameshwar Prasad*, Amit Kumar, Pradeep Kumar, Rohit Bhatia, Manjari Tripathi

Department of Neurology, All India Institute of Medical Sciences, New Delhi, India

ARTICLE INFO

Article history:

Received 26 February 2013

Received in revised form 31 October 2013

Accepted 4 November 2013

Available online 13 November 2013

Keywords:

Acute stroke
Prediction
Mechanical ventilation
Hemorrhagic stroke
Ischemic stroke
Prospective study

ABSTRACT

The purpose of this study was to identify clinical factors which may help in predicting the requirement of support of mechanical ventilation (MV) in patients with stroke. This was a prospective cohort study done at a tertiary referral center of India, from December 2008 to December 2009. All consecutive patients of acute stroke, who were admitted from emergency or through outpatient department, and were ≥ 18 years and in whom written consent was available, were considered for the study. Of 193 patients included in the study, 60 (31.08%) patients were intubated due to various reasons. Multivariate analysis of statistically significant and most clinically important variables showed that overall predictor accuracy of requirement of mechanical ventilation is 88% if patients had history of progression of symptoms (OR = 10.38; $p < 0.001$), loss of consciousness at the time of onset (OR = 3.18; $p = 0.011$) and GCS motor score ≤ 5 ($p < OR = 34.62$; 0.001). The findings of this study suggest that factors including the presence of poor sensorium, the progression of symptom and low motor GCS are independent predictors of requirement of mechanical ventilation in patients with stroke and appropriate and cautious timely use of MV can help in improving mortality and morbidity from stroke.

© 2013 Elsevier B.V. All rights reserved.

1. Introduction

Stroke is one of the leading cause of mortality in developed and as well as in developing countries. The prevalence of stroke in India varies in different regions of the country and different studies have reported prevalence rate ranging from 40 to 270 per 100000 population. Approximately 12% of all strokes occur in the population < 40 years of age. The number has increased in the last few years by 17.5% and mortality due to stroke has increased by 7.8% from 1998 to 2004 [1].

The mortality and survival in stroke patients depend on various factors like demographic, comorbidity, severity and specific therapy [2,3]. The mortality during the initial few days of stroke is determined primarily by compression of vital centers controlling respiration, autonomic functions, and arousal, in the brain stem due to brain swelling and herniation. Treatment for impending or early herniation requires intubation and mechanical ventilation, the objective of ventilation is respiratory support and ensuring adequate oxygenation and along with it are other therapies to reduce raised ICP, like medical or surgical management. The early detection of deterioration in neurological status and prompt action may prevent further permanent damage to brain. The endotracheal intubation in patients with stroke may also be warranted due to airway compromise or decreased level of consciousness

and in patient developing respiratory complications, in order to prevent hypoxia and potential worsening of the neurological injury.

Up to 10% of patients with acute stroke need mechanical ventilation due to different reasons [4]. Many health care centers in India do not have the facility of mechanical ventilation. Identifying patients who will potentially require ventilatory support and referring them to hospitals where such facilities exist, help in reducing the mortality and morbidity from stroke. The identification of such patients early on is also very important because delay in mechanical ventilation almost always leads to death within the next 24 to 48 h [1]. But again at many places there may not be any neurologist available and there are no simple clinical guidelines which may help a physician in identifying such patients and referring them to equipped centers.

However, the prognosis of stroke patients treated with mechanical ventilation is reported to be poor. Mortality rates of 49% to 93% have been reported in various studies and outcome studies have also shown that most of the survivors are left with severe disability [4–12]. In view of high cost of intensive care units (ICUs) and reports of high mortality and morbidity [4–12], in ventilated patients, the cost effectiveness becomes an important issue [13], especially in places with limited resources. So, optimum utilization of health care resources is also required along with consideration of best interest of patients.

Decision to intubate and maintain patient on mechanical ventilation is challenging considering high mortality rate and very poor outcome [8]. However, endotracheal intubation is also an emergent life-supportive measure, and it is difficult to predict which patients will have meaningful neurological recovery. So, clinical methods to predict survival and meaningful outcome are also important, as it may also

* Corresponding author at: Department of Neurology, Room No. 704, Neurosciences Centre, All India Institute of Medical Sciences, Ansari Nagar, New Delhi, India. Tel.: +91 11 26593497, +91 11 26588979; fax: +91 11 26588663, +91 11 26588979.

E-mail address: kp0704@gmail.com (K. Prasad).

influence the management decisions and justification for the use of recourses. The present study has the objective of identifying clinical factors which may help in predicting the requirement of support of mechanical ventilation in patients with stroke and evaluating the outcome of patients who require ventilator support.

2. Material and methods

2.1. Study design

This was a prospective cohort study of patients of acute stroke. This study was done at All India Institute of Medical Science, New Delhi (a tertiary referral center of India), from December 2008 to December 2009.

2.2. Ethical aspects

Ethical clearance was taken from institutional ethical committee of All India Institute of Medical science, New Delhi. The study was conducted after taking written informed consent from all patients or their attendants, explaining the nature and need of the study.

2.3. Selection of subjects

Consecutive patients of acute stroke, who were admitted from emergency or through outpatient department of neurology in All India Institute of Medical Sciences, were considered for the study. A total of 193 cases of acute stroke were finally included in this study after fulfilling the inclusion and exclusion criteria.

2.4. Inclusion criteria

Patients were included in the study if they had all of the following:

- Stroke defined as the presence of sudden onset of focal neurological deficit and admitted within 24 h of onset of symptoms.
- Age was ≥ 18 years.
- Written informed consent was available.

2.5. Exclusion criteria

Patients meeting the inclusion criteria were excluded if they had any of the following:

- Already intubated at the time of admission.
- Died before giving mechanical ventilation.

2.6. Predictor variables

Factors which may predict the requirement of mechanical ventilation were considered for the analysis. These factors were related to patient's characteristics, presenting symptoms and signs and imaging findings.

2.7. Outcome variables

The requirement of mechanical ventilation (a patient was considered as requiring a ventilator if mechanical ventilation was used for supporting his/her respiration) and outcome during hospital stay (died or discharged alive) was considered for the analysis. The outcome of discharged patients was determined by assessment of disability or handicap was done by modified Barthel index and modified Rankin scale.

2.8. Baseline assessment

All patients were assessed by attending neurologist and patients characteristics (age, sex, risk factors of stroke, comorbid illness), presenting symptoms and signs (history of headache, vomiting, loss of consciousness, seizures at the onset of symptoms, progression of symptoms since the onset – deterioration in sensorium or any neurological deficit, systolic blood pressure, diastolic blood pressure, respiratory pattern, presence of fever, Glasgow coma scale, pupil reflex, conjugate eye deviation, facial weakness, papilloedema, bilateral tract signs) and imaging findings (type of stroke, territory involved, presence of mid line shift, herniation and hematoma volume in cases of hemorrhage, presence or absence of intraventricular hemorrhage). Base line comparison between the patients with mechanical ventilation and without mechanical ventilation at the time of admission is shown in Table 1. Base line comparison between the patients who died and discharged patients who were on mechanical ventilation is shown in Table 2. Volumetric analysis was undertaken on the haematoma patients using the ABC/2 technique [14]. The ABC/2 calculation was made as follows: A – maximal hematoma diameter, B – diameter of hematoma is 90° to A, C – number of slices in vertical plane with hematoma multiplied by slice thickness of 0.5 cm. These values (ABC) were multiplied and then divided by 2, respectively. To obtain the volume in cm^3 , the final product was divided by 2.

2.9. Follow-up

All patients were followed up during their hospital course and records were made if they require mechanical ventilation and cause of intubation, clinical findings at the time of intubation, complications during hospitalization and intervention were also recorded. Decision to intubate and to start mechanical ventilation was taken by attending neurologist. All patients received adequate nonsurgical and medical treatment (IV fluids, mannitol, antibiotics, bronchodilators, diuretics, etc.) for neurologic and associated medical conditions. Surgical management (decompressive hemicraniectomy, hemicraniotomy with

Table 1

Base line comparison between the patients required mechanical ventilation and not required mechanical ventilation at the time of admission.

| | Mechanical ventilation | | p value |
|---------------------------|------------------------|----------------------|---------|
| | No(n = 133) | Yes(n = 60) | |
| Age | 53.69 \pm 15.01 | 53.47 \pm 14.02 | 0.922 |
| Male | 83(62.4%) | 41(68.3%) | 0.426 |
| Hypertension | 69(51.9%) | 49(81.7%) | <0.01 |
| Diabetes mellitus | 25(18.8%) | 10(16.7%) | 0.722 |
| Prior stroke | 7(5.30%) | 11(18.6%) | 0.005 |
| Atrial fibrillation | 7(1.7%) | 1(5.3%) | 0.439 |
| Smoking | 32(24.1%) | 18(30.0%) | 0.383 |
| Comorbid illness | 18(13.5%) | 5(8.3%) | 0.302 |
| Pulse | 83.29 \pm 11.698 | 87.40 \pm 16.46 | 0.049 |
| Systolic blood pressure | 155.85 \pm 32.794 | 177.60 \pm 43.79 | 0.001 |
| Diastolic blood pressure | 94.03 \pm 16.324 | 103.07 \pm 23.84 | 0.009 |
| Barthel index | 38.14 \pm 33.862 | 2.33 \pm 10.67 | 0.641 |
| GCS (motor) | 5.76 \pm .836 | 3.80 \pm 1.72 | <0.05 |
| Total GCS | 13.98 \pm 2.139 | 7.45 \pm 3.40 | <0.05 |
| GCS(Motor score \leq 5) | 17(24.6%) | 52(75.4%) | <0.05 |
| Progression | 13(10.4%) | 32(54.2%) | <0.05 |
| Headache | 18(13.5%) | 15(25.0%) | 0.050 |
| Vomiting | 19(14.3%) | 26(43.3%) | <0.05 |
| Seizure | 4(3.0%) | 10(16.7%) | 0.002 |
| Loss of consciousness | 16(12.0%) | 36(60.0%) | <0.05 |
| Incontinence | 42(31.80%) | 54(90.0%) | <0.05 |
| Bilateral tract sign | 9(8.0%) | 7(13.3%) | 0.286 |
| Abnormal pupil reflex | 12(10.9%) | 9(17.30%) | 0.258 |
| Midline shift | 1(0.8%) | 32(53.3%) | <0.05 |
| Herniation | 0 | 10(16.7%) | <0.05 |
| Hematoma volume | 22.79 \pm 14.28 ml | 53.61 \pm 30.43 ml | <0.001 |

GCS: Glasgow coma scale,

Download English Version:

<https://daneshyari.com/en/article/8277987>

Download Persian Version:

<https://daneshyari.com/article/8277987>

[Daneshyari.com](https://daneshyari.com)