

Characteristics and Outcomes of Stroke Patients Admitted to the Medical Ward and the Intensive Care Unit of a Tertiary Hospital in Saudi Arabia.

Meshari S. Alsudayri¹, Kareem S. Alshammari¹, Osama S. Aljameel¹, Fahad S. Alhuqayl¹, Hussain G. Ahmed¹

¹Faculty of medicine, University of Hail, Hail, Saudi Arabia.

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ABSTRACT

Background: Stroke is a major source of morbidity and mortality worldwide. Patients with stroke are often managed in the medical ward. However patients with severe stroke, constituting a bout 15-20%, require admission into the Intensive Care Unit (ICU). Despite this, there are little data available on the characteristics and functional outcome of survivors amongst stroke patients admitted to the ICU and those admitted to the medical ward. Aim: to determine characteristics, functional outcomes of survivors and predictors of poor outcome in patients admitted to the medical ward and the ICU with a primary diagnosis of stroke at king Khalid Hospital in Hail, Saudi Arabia. **Methods:** We reviewed the medical records of all stroke patients admitted to the ICU and the medical ward between February 2010 and July 2016, at King Khalid Hospital in Hail. Demographic characteristics, clinical features and course, treatment options and outcome of all stroke patients were documented on pre-defined data sheets. **Result:** A total 1187 files of stroke patients were reviewed. The male to female ratio was 2:1 and patients aged >60 years accounted for 74.6%. Ninety percent of Stroke patients were admitted into the medical ward, while less than 10% were admitted to ICU. Stroke patients in the ICU had a mortality rate of 73.2%. While the mortality rate of patients admitted to the medical ward was 17.6%. Patients admitted into the ICU were 4 times more likely to die compared to stroke patients admitted to medical ward ($p=0.002$, $OR=4.472$). However, admission location had no significant impact on duration of patients' hospital stay ($p=0.454$, $OR=1.464$). **Conclusion:** Intensive care admission was found to be associated with a high mortality rate and a high likelihood of dependent lifestyle after hospital discharge. We suggest that clinicians critically examine the suitability of stroke patients requiring ICU admission in the light of these findings and other published data.

Keywords: Stroke, Admission, outcome, Intensive care Unit, Medical ward.

INTRODUCTION

Stroke is a major cause of morbidity and mortality worldwide.^[1] About 90% of stroke patients are managed in the medical wards.^[2] However, patients with severe stroke, defined as National Institute of Health Stroke Scale (NIHSS) score >17 constituting about 10-20%, require admission into the Intensive Care Unit (ICU).^[3] The evaluation of clinical outcome for stroke patients has involved a variety of approaches. Some studies have compared stroke outcome in academic and community hospitals.^[4-5] Others have concentrated on examining the value of intensive care units for acute stroke patients.^[6-11] Some researchers have been interested in predicting

the outcome of stroke.^[12-15] In a study done by Marik at University of Massachusetts, in USA, 40 patients were studied, ICU mortality was found to be 28% and medical ward mortality was found to be 9%. 16 Another study by Burtin had reported a higher ICU mortality rate of 73% and one-year mortality rate of 92% for patients with severe stroke. Patients with severe stroke suffer a high mortality despite care in the intensive care unit. In contrast to patients admitted to medical ward, patients admitted into the ICU have various critical issues affecting their clinical outcome; ranging from unstable blood pressure that is difficult to control, arrhythmias, myocardial infarction, and impaired level of consciousness or a massive hemispheric or cerebellar infarct.^[17] A study had surveyed the outcomes pattern among neurological patients in Saudi Arabia.^[18] But to the best of our knowledge no study had reported any case of stroke among the patients studied. This study therefore looked at stroke patients admitted into the ICU and the medical ward with the aim of determining the

Name & Address of Corresponding Author

Dr Meshari S. Alsudayri
Faculty of Medicine,
University of Hail,
Hail, Saudi Arabia

outcome in terms of ICU mortality, duration of stay and demographics of the patients.

MATERIALS AND METHODS

A Retrospective, cross-sectional study was carried out at King Khalid Hospital in Hail City which is located in the northwestern of Saudi Arabia and has a population of around 412,758 inhabitants, the hospital provides multidisciplinary health care to the population of the northern province of KSA. The hospital operates an established electronic medical records data bank system with ICD (international classification of diseases) coding. We retrieved the records of 4200 patients through the electronic data bank system who were admitted under the neurology service from February 2010 till July 2016. Out of these 1187 patients were diagnosed as having ischaemic cerebrovascular disease.

The medical records of these patients fulfilling the diagnostic criteria for acute stroke, as defined by the World Health Organization; as rapidly developing clinical signs of focal or global disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular in origin were included in the study.^[19]

Patients with transient ischemic attacks, cerebral venous sinus thrombosis, and hemorrhagic strokes were excluded. All patients were reviewed and assessed by a neurologist. A total of 1187 records of male and female stroke patients, aged between 30 to more than 80 years were included. The demographic characteristics, causes of stroke (coronary artery disease, atrial fibrillation), outcomes and duration of hospital stay were documented on pre-defined data sheets. The study was approved by ethical committee of King Khalid Hospital. Statistical analysis of the data was done using SPSS version 20.0. Descriptive statistics i.e. mean \pm standard deviation for numerical values and frequencies along with percentages for categorical variables were used to describe the data. A p-value of <0.05 was considered statistically significant.

RESULTS

A total 1187 files of stroke patients were reviewed. Male were 57.9% and female were 42.1%. Patients aged >60 years accounted for 74.6% of the studied sample as shown in [Table 1]. The mean age was 69.7 ± 16.4 SD.

Ninety percent of Stroke patients were admitted into the medical ward, while less than 10% were admitted to ICU. The mean duration of hospital stay was 5 ± 2.7 SD. Table 2 showed that 73.8% of stroke patients stayed in the hospital between 1-7 days. And 18.7% stayed between 2-3 weeks while only 5% of stroke patients stayed for more than 3 weeks.

Stroke patients in the ICU had a mortality rate of 73.2%. While the mortality rate of patients admitted to the medical ward was 17.6%. Patients admitted into the ICU were 4 times more likely to die compared to stroke patients admitted to medical ward ($p=0.002$, $OR=4.472$). However, admission location had no significant impact on duration of patients' hospital stay ($p=0.454$, $OR=1.464$).

[Table 3] showed that majority of stroke patients (63.8%) were normally discharged home, 16.1% discharged home against medical advice (DAMA) and 2.3% transferred from ICU to medical ward.

Regarding the cause of stroke, congestive heart disease (CHD) and atrial fibrillation (AF) were almost equally distributed representing 11.2% and 9.6% respectively.

The cause of stroke whether CHD or AF had no significant impact on outcome, p value= 1.00.

Also, severe stroke had no significant impact on duration of ICU stay ($p=0.374$, $OR=1.534$).

Table 1: Socio-demographics characteristics of the participants

Variable	No.	Percent (%)
Sex		
Male	687	57.9%
Female	500	42.1%
Age		
<60	301	25.3%
60-80	568	47.9%
>80	318	26.8%
Nationality		
Saudi	1050	88.5%
Non-Saudi	137	11.5%

Table 2. Duration of hospital stay

Duration	Frequency	Percent
<3 days	524	44.1%
4-7 days	352	29.7%
8-15 days	190	16.0%
16-21	32	2.7%
22-30	52	4.4%
31+	37	3.1%

Table 3. Outcome of Stroke

Outcome	Frequency	Percent
normal discharge	757	63.8
died	209	17.6
DAMA	191	16.1
Transferred	30	2.5

DISCUSSION

Stroke patients in the ICU had a mortality rate of 73.2%. While the mortality rate of patients admitted to the medical ward was 17.6%. Patients admitted into the ICU were 4 times more likely to die compared to stroke patients admitted to medical ward. A previous study by Burthin et al also reported a mortality rate of 73% which was similar to our finding. 17 Most of the patients (73.8%) in this study had stayed in the hospital between 1-7 days. Length of stay in the hospital has been found to have

conflicting effect on patient's outcome. Some authors have reported a good outcome with patients' prolonged hospital stay,^[19] others did not find any such association.^[20] Other than length of stay, the severity of illness has been found to be more predictive of outcome in the ICU.^[21]

This study revealed that both causes of stroke, CHD and AF were equally distributed among stroke patients. This could be due to the fact that admission of stroke patients into the ICU is independent of the cause of stroke. Apart from this, patient outcome was not significantly affected by the cause of stroke. One obvious limitation of this study arises from the fact that it is a retrospective study. However, we have established that although, stroke patients constituted a small proportion of our ICU admission, they have a high mortality rate. This is independent of the type and cause of stroke and whether transferred from ward or direct admission from the emergency room.

CONCLUSION

Intensive care admission was found to be associated with a high mortality rate and a high likelihood of dependent lifestyle after hospital discharge. We suggest that clinicians critically examine the suitability of stroke patients requiring ICU admission in the light of these findings and other published data.

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