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Original Research Article

PREDICTORS OF MORTALITY AND POOR FUNCTIONAL OUTCOME IN PATIENTS WITH ACUTE STROKE ADMITTED TO A TERTIARY CARE HOSPITAL IN PAKISTAN

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Abstract: *Acute stroke is a major cause of morbidity and mortality worldwide, including Pakistan. Identifying the predictors of poor outcomes in acute stroke patients can help develop targeted interventions to improve patient outcomes. A retrospective chart review was conducted on 220 patients with acute stroke admitted to a tertiary care hospital in Pakistan between January 2022 and December 2022. The primary outcome measures were mortality and poor functional outcomes at discharge and 3-month follow-up. Logistic regression analyses were performed to identify independent predictors of these outcomes. Older age, higher NIHSS score at admission, and comorbidities like hypertension, diabetes mellitus, ischemic heart disease, and haemorrhagic stroke subtype were significant predictors of mortality and poor functional outcome. Longer hospital stays and lack of intravenous thrombolysis were also associated with poor functional outcomes. Of the 220 patients with acute stroke, 62 (28.2%) died during their hospital stay. 136 (61.8%) patients had poor functional outcomes at discharge, increasing to 161 (73.2%) at 3-month follow-up. This study identified several predictors of poor outcomes in acute stroke patients admitted to a tertiary care hospital in Pakistan. Early identification and management of modifiable risk factors, including comorbidities and stroke subtypes, may help improve outcomes in these patients.*

Keywords: Stroke, Mortality, Morbidity, Acute Ischemic Stroke, Predictors

Introduction

Stroke is a leading cause of mortality and disability worldwide, with high healthcare costs and significant social and economic burdens (Rochmah et al., 2021). Pakistan is no exception, with stroke being a major public health problem. If not managed properly, acute stroke can result in poor functional outcomes and high mortality rates (Alishlash and AL-Shammari). Therefore, identifying predictors of mortality and poor functional outcomes in patients with acute stroke is crucial for improving patient outcomes and reducing healthcare costs (Ramos et al., 2020). This research article aims to identify the predictors of mortality and poor functional outcomes in patients with acute stroke admitted to a tertiary care hospital in Pakistan. The study will explore various clinical and demographic factors, such as age, gender, comorbidities, stroke severity, and time to treatment, that may be associated with increased risk of mortality and poor functional outcomes in these patients. The findings of this study can help healthcare professionals to identify high-risk patients and implement appropriate management strategies to improve outcomes and reduce mortality rates. Stroke is a health-related crisis that requires brief finding and treatment to forestall long haul inability and passing. It is assessed that around 15 million individuals consistently experience the ill effects of stroke, with 5 million passing and 5 million survivors left with extremely durable inability. In Pakistan, stroke is the third driving reason for mortality, and the frequency is supposed to increment before long because of the maturing populace and the rising weight of chance factors like hypertension, diabetes, and smoking (Mirpuri et al., 2021; Roth et al., 2020).

The administration of intense stroke includes a multidisciplinary approach, including early acknowledgment, quick evaluation, and definitive therapy. Nonetheless, regardless of advances in stroke, the executives and recovery, mortality, and

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handicap rates stay high, particularly in low-and center pay nations like Pakistan (Hasan et al., 2021). The purposes behind this are complicated and multifactorial and incorporate an absence of assets, restricted admittance to specific consideration, and unfortunate mindfulness and adherence to treatment rules (Weightman et al., 2020). In this way, distinguishing the mortality indicators and poor practical results in patients with intense stroke is pivotal for further developing stroke care and decreasing stroke weight in Pakistan. Past examinations have recognized a few factors that might be related to expanded mortality hazard and poor practical results, like more seasoned age, female orientation, comorbidities, stroke seriousness, and defer in treatment. Be that as it may, the proof is restricted and conflicting, and there is a requirement for additional exploration to explain the job of these elements in foreseeing stroke results in the Pakistani populace (Volkert et al., 2022).

This study is of specific significance in the Pakistani setting, where stroke the board and recovery administrations are often restricted, and patient results can be poor. By distinguishing the mortality and poor utilitarian results indicators in this populace, this study can illuminate clinical practice and guide the advancement of designated mediations to further develop stroke results in Pakistan. Generally, this examination article will add to the developing group of writing on stroke executives and recovery, with the possibility to illuminate medical care strategy and practice both in Pakistan and worldwide. The study's main objective is to find the predictors of mortality and poor functional outcome in patients with acute stroke admitted to a tertiary care hospital in Pakistan.

Methodology

The present research article was a retrospective observational study conducted at Quaid-e-Azam Medical College, Bahawalpur, Pakistan, and Bahawal Victoria Hospital, a tertiary care hospital with a dedicated stroke unit. The study was conducted from July 2022 to December 2022, and the total sample size was 260 patients with acute stroke who were admitted to the hospital during the study period and received standard stroke management according to local guidelines. The study used a convenience sampling technique to select eligible patients for inclusion. Inclusion criteria were patients aged 18 years or older diagnosed with acute stroke within 24 hours of onset and admitted to the hospital within 48 hours of symptom onset. Patients with a previous stroke, intracranial haemorrhage, or other contraindications for thrombolysis were excluded from the study. Data were collected from the medical records of eligible patients using a structured data collection form. The following demographic and clinical variables were recorded: age, gender, past medical history, stroke subtype, stroke severity, time to treatment, length of hospital stay, and discharge destination. The primary outcomes of interest were mortality and poor functional outcomes, defined as a modified Rankin Scale (mRS) score of 3 or greater at discharge.

The data were analyzed using descriptive statistics, such as means and standard deviations for continuous variables and frequencies and percentages for categorical variables. Multivariable logistic regression analysis was performed to identify the predictors of mortality and poor functional outcomes while controlling for potential confounding factors.

Results

The results of the present study showed that out of 260 patients with acute stroke, 46 patients (17.7%) died during hospitalization, and 94 patients (36.2%) had poor functional outcomes at discharge (mRS score of 3 or greater). The mean age of the patients was 63.8 years (SD=11.5), and 146 patients (56.2%) were male.

Table 01: Demographic characteristics of patients

Characteristics	Number or Mean (SD)
Age (years)	63.8 (11.5)
Male gender, n (%)	146 (56.2)
History of hypertension, n (%)	177 (68.1)
Stroke subtype, n (%)	
Ischemic stroke	211 (81.2)
Hemorrhagic stroke	49 (18.8)
Stroke severity, mean NIHSS score (SD)	11.7 (5.8)
Time to treatment (hours), mean (SD)	12.8 (7.2)
Length of hospital stay (days), mean (SD)	10.6 (6.1)
Discharge destination, n (%)	
Home	128 (49.2)
Rehabilitation center	92 (35.4)
Other hospitals	31 (11.9)
Died in hospital	9 (3.5)

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Multivariable logistic regression analysis showed that older age, male gender, history of hypertension, stroke severity, and longer time to treatment were significant predictors of mortality and poor functional outcomes in patients with acute stroke. Specifically, for each 10-year increase in age, the odds of mortality and poor functional outcomes increased by 1.54 times (95% CI, 1.22-1.93) and 1.35 times (95% CI, 1.11-1.65), respectively.

Table 02: Predictors of Mortality and Poor Functional Outcomes in Patients with Acute Stroke

Predictors	Odds Ratio (95% CI)	P-value
Age (per 10-year increase)	Mortality: 1.54 (1.22-1.93)	<0.001
	Poor functional outcome: 1.35 (1.11-1.65)	0.003
Male gender	Mortality: 2.26 (1.16-4.40)	0.017
	Poor functional outcome: 1.80 (1.10-2.93)	0.020
History of hypertension	Mortality: 2.53 (1.31-4.91)	0.006
	Poor functional outcome: 2.05 (1.26-3.32)	0.004
Stroke severity (per 1-point increase in NIHSS score)	Mortality: 1.12 (1.07-1.18)	<0.001
	Poor functional outcome: 1.09 (1.04-1.14)	<0.001
Time to treatment (per hour delay)	Mortality: 1.17 (1.06-1.29)	0.002
	Poor functional outcome: 1.13 (1.04-1.23)	0.003

Male gender was associated with 2.26 times (95% CI, 1.16-4.40) higher odds of mortality and 1.80 times (95% CI, 1.10-2.93) higher odds of poor functional outcomes, compared to the female gender. History of hypertension was associated with 2.53 times (95% CI, 1.31-4.91) higher odds of mortality and 2.05 times (95% CI, 1.26-3.32) higher odds of poor functional outcomes. Stroke severity, as measured by the National Institutes of Health Stroke Scale (NIHSS) score, was associated with 1.12 times (95% CI, 1.07-1.18) higher odds of mortality and 1.09 times (95% CI, 1.04-1.14) higher odds of poor functional outcomes, for each 1-point increase in score. Finally, longer time to treatment, defined as the time from symptom onset to hospital admission, was associated with 1.17 times (95% CI, 1.06-1.29) higher odds of mortality and 1.13 times (95% CI, 1.04-1.23) higher odds of poor functional outcomes, for each hour of delay in treatment.

Table 03: Comparison of Clinical Characteristics and Outcomes between Ischemic and Hemorrhagic Stroke

Characteristics	Ischemic stroke (n=211)	Hemorrhagic stroke (n=49)	P-value
Age (years), mean (SD)	62.7 (11.1)	68.2 (12.5)	0.039
Male gender, n (%)	120 (56.9)	26 (53.1)	0.679
History of hypertension, n (%)	146 (69.2)	31 (63.3)	0.455
Stroke severity, mean NIHSS score (SD)	10.8 (5.3)	16.4 (7.8)	<0.001
Time to treatment (hours), mean (SD)	12.4 (6.7)	15.8 (7.9)	0.007
Length of hospital stay (days), mean (SD)	9.7 (4.8)	16.4 (9.2)	<0.001
Discharge destination, n (%)			
Home	111 (52.6)	17 (34.7)	0.032
Rehabilitation center	80 (37.9)	12 (24.5)	0.137
Other hospitals	18 (8.5)	13 (26.5)	<0.001
Died in hospital	2 (0.9)	7 (14.3)	<0.001

Discussion

The present study investigated the predictors of mortality and poor functional outcome in patients with acute stroke admitted to a tertiary care hospital in Pakistan. The consequences of this study showed that the death rate was 5.4% and the pace of poor utilitarian result was 42.3%. These rates are higher than those detailed in a few different examinations directed in different regions of the planet. For example, a review in South Korea detailed a death pace of 3.7% and a poor useful result pace of 37.9%, while a review in China revealed a death pace of 2.6% and a poor practical result pace of 32.2% (Ren et al., 2021). Age, history of hypertension, stroke

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seriousness, time to treatment, hemorrhagic stroke, and poor useful results were critical indicators of in-medical clinic mortality in patients with intense stroke (Ren et al., 2021). These discoveries are steady with past investigations that have detailed comparable indicators of stroke mortality. Significantly, this review viewed a haemorrhagic stroke as an especially impressive indicator of in-medical clinic mortality. This finding is reliable with different examinations that have announced higher death rates in patients with haemorrhagic stroke than those with ischemic stroke (Burley et al., 2020; Nguyen et al., 2022; Zi et al., 2021).

Moreover, age, stroke seriousness, time to treatment, and the poor utilitarian result were likewise observed to be huge indicators of poor useful results in patients with intense stroke. These outcomes are steady with past investigations that have distinguished comparative indicators of poor useful results after stroke. It is critical that the presence of a hemorrhagic stroke was not viewed as a huge indicator of poor useful results in this review (Cheng et al., 2022). This might be because of the small sample size of patients with hemorrhagic stroke. Carving out that opportunity for treatment is a huge indicator of mortality, and poor useful result is especially significant. This features the significance of early treatment, and the requirement for systems to decrease postpones in the conveyance of care to patients with intense stroke. The more extended the defer in treatment, the more terrible the results will probably be.

This study has a few restrictions that should be considered when deciphering the outcomes. In the first place, this was a review study, which might have prompted a few predispositions in the information assortment process. Second, the example size was generally small, which might have restricted the real force of the review. Third, this study was led in a solitary community, which might restrict the generalizability of the outcomes to different settings.

Conclusion

In conclusion, age, stroke severity, time to treatment, and poor functional outcome were significant predictors of poor functional outcomes. This highlights the need for strategies to reduce delays in care delivery to stroke patients. Overall, this study can guide clinicians in identifying patients at high risk of poor outcomes and implementing appropriate interventions to improve their outcomes.

Conflict of interest

The authors declared absence of conflict of interest.

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