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A STUDY OF CLINICAL PROFILE AND OUTCOME IN ACUTE HEMORRHAGIC STROKE IN VIMS, BALLARI

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ABSTRACT:

Introduction: Cerebrovascular diseases rank first in frequency and importance among all neurologic diseases. Acute hemorrhagic stroke, accounting for 15-20% of all strokes, carries significant mortality and morbidity. This study aimed to analyze the clinical profile, risk factors, and outcome predictors in acute hemorrhagic stroke patients.

Methods: A prospective case series study was conducted on 60 patients with acute hemorrhagic stroke admitted to VIMS, Ballari, between December 2016 and February 2018. Clinical parameters, CT findings, and outcomes were assessed using the Modified Rankin Scale.

Results: The mean age was 60.02 years, with male predominance (63%). Hypertension (72%) was the most common risk factor, and hemiparesis (47%) was the predominant presenting symptom. Gangliocapsular region (41.7%) was the most frequent site of hemorrhage. Glasgow Coma Scale score ($p<0.0000001$), hemorrhage volume >30cc ($p=0.000006$), intraventricular extension ($p=0.025$), and midline shift ($p=0.0003$) significantly correlated with poor outcomes. The ICH score showed strong prognostic value ($p=0.00092$). Neurosurgical intervention, when indicated, significantly influenced outcomes ($p=0.04$).

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Conclusion: The study identified critical prognostic factors in acute hemorrhagic stroke. Early recognition of these factors can guide management strategies and improve patient outcomes. The ICH score proves valuable for risk stratification and prognosis prediction.
Keywords: Acute hemorrhagic stroke, ICH Score, Glasgow Coma Scale, CT findings, prognostic factors, neurosurgical intervention, stroke outcomes, risk factors.

INTRODUCTION

Stroke remains one of the leading causes of mortality and long-term disability worldwide, posing a significant public health challenge [1]. Hemorrhagic stroke, accounting for approximately 15-20% of all strokes, carries a particularly grave prognosis with mortality rates ranging from 35-52% within the first 30 days [2]. The burden is especially pronounced in developing countries like India, where the incidence of hemorrhagic stroke has shown an alarming upward trend in recent decades [3].

Intracerebral hemorrhage (ICH) results from the rupture of small vessels damaged by chronic hypertension or other vascular abnormalities, leading to extravasation of blood into the brain parenchyma [4]. The resultant formation of hematoma, coupled with perilesional edema, creates a cascade of pathophysiological events that contribute to neurological deterioration. The acute phase is characterized by both primary injury from mechanical disruption and secondary injury from inflammation, oxidative stress, and excitotoxicity [4,5].

The clinical presentation of hemorrhagic stroke varies considerably, depending on the location and volume of the hemorrhage [5]. While some patients present with mild neurological deficits, others manifest with devastating symptoms including severe headache, altered consciousness, focal neurological deficits, and rapid clinical deterioration. This heterogeneity in presentation poses significant challenges in prognostication and management decisions [6].

Recent advances in neuroimaging, particularly the widespread availability of CT and MRI, have revolutionized the diagnosis and management of hemorrhagic stroke [7]. However, the optimal management strategy remains controversial, with ongoing debates regarding the role of surgical intervention versus conservative management in different clinical scenarios [8].

The Vijayanagara Institute of Medical Sciences (VIMS), Ballari, being a tertiary care center in Karnataka, serves a large population base and encounters numerous cases of

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hemorrhagic stroke. This study aims to analyze the clinical profile, risk factors, and outcomes of acute hemorrhagic stroke patients treated at our institution [9], with the goal of identifying prognostic factors that could guide management decisions and improve patient outcomes [10].

METHODOLOGY

The study was a prospective case series conducted at the Medical College Hospital, Vijayanagar Institute of Medical Sciences (VIMS), Ballari, between December 2016 and February 2018. After obtaining ethical committee approval, 60 patients aged above 16 years with acute hemorrhagic stroke admitted to the medicine wards were included in the study. Patients with traumatic intracerebral hemorrhage, hemorrhagic infarct, and subarachnoid hemorrhage were excluded.

Informed consent was obtained from the patients or their closest relatives in cases of altered sensorium. Detailed demographic, social, economic, and medical information was collected using a structured proforma. The clinical data gathered included age, presenting symptoms, pre-existing risk factors, temperature at admission, mean arterial pressure, and Glasgow coma score (GCS).

All patients underwent CT brain scanning on the day of admission. The imaging data collected included location of bleed, volume of bleed (calculated using the ABC/2 technique), presence of intraventricular hemorrhage, midline shift, and hydrocephalus. The Intracerebral Hemorrhage (ICH) Score was calculated for each patient based on these parameters.

Patients were followed up during their hospital stay and evaluated for co-morbid illnesses. The outcome was assessed on the 30th day after discharge (or earlier in case of death) using the Modified Rankin Scale (MRS). A score greater than 4 was considered a poor outcome, while a score less than or equal to 4 was deemed a good outcome.

Statistical analysis was performed using IBM SPSS version 22 for Windows. Qualitative data was represented as frequency and percentage, while quantitative data was expressed as mean and standard deviation. Analysis within groups was done using paired t-test, and intergroup comparison was performed using unpaired t-test if data passed the normality test. A P-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1 presents the demographic and clinical characteristics of the study population, highlighting the predominance of male patients (63%) and hypertension (72%) as the most

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common risk factor. The mean age of presentation was 60.02 years, with hemiparesis being the most frequent presenting symptom (47%).

Table 2 demonstrates the significant correlation between admission Glasgow Coma Scale and outcomes ($p<0.0000001$), while mean arterial pressure and temperature showed no significant impact on prognosis.

Table 3 illustrates CT findings, revealing gangliocapsular region as the most common site of hemorrhage (41.7%). Hemorrhage volume >30cc ($p=0.000006$), intraventricular extension ($p=0.025$), and midline shift ($p=0.0003$) were significantly associated with poor outcomes.

Table 4 showcases the prognostic value of the ICH score, with all patients having score 0 showing good outcomes ($p=0.00092$). Neurosurgical intervention, when indicated, significantly influenced outcomes ($p=0.04$).

Table 1: Demographic and Clinical Characteristics of Patients (N=60)

Characteristics		**n (%) or Mean±SD**
Mean Age (years)		60.02±11.5
Gender	**Male**	38 (63%)
	Female	22 (37%)
Primary Symptoms	**Hemiparesis**	28 (47%)
	Loss of consciousness	22 (36%)
	Seizures	7 (12%)
Risk Factors	**Hypertension**	43 (72%)
	Diabetes Mellitus	15 (25%)
	Smoking	25 (42%)
	Alcoholism	24 (40%)

Table 2: Clinical Parameters at Admission and Their Impact on Outcome

Parameter		**Good Outcome (MRS≤4)**	**Poor Outcome (MRS>4)**	**P-value**
Glasgow Coma Scale	**≤8**	1 (3.9%)	25 (96.2%)	**<0.001**
	9-12	13 (92.9%)	1 (7.1%)	
	≥13	19 (95%)	1 (5%)	

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Mean Arterial Pressure ≥135mmHg	**< 135**	< 135	< 135	0.89
	≥ 135	≥ 135	≥ 135	
Temperature >100°F		3 (33.3%)	6 (66.7%)	0.29

Table 3: CT Findings and Their Correlation with Outcome

CT Parameter		**Good Outcome (MRS≤4)**	**Poor Outcome (MRS>4)**	**P-value**
Location	**Gangliocapsular**	18 (72%)	7 (28%)	**0.001**
	Lobar	3 (18.8%)	13 (81.2%)	
	Thalamus	8 (80%)	2 (20%)	
	Cerebellum	4 (66.7%)	2 (33.3%)	
	Brainstem	0	3 (100%)	
Volume	**≤ 30CC**	30 (76.9%)	9 (23.1%)	**<0.001**
	> 30CC	3 (14.3%)	18 (85.7%)	
Intraventricular Haemorrhage		5 (31.2%)	11 (68.8%)	**0.025**
Midline Shift		0 (0%)	12 (100%)	**<0.001**

Table 4: ICH Score and Intervention Outcomes

Parameter		**Good Outcome (MRS≤4)**	**Poor Outcome (MRS>4)**	**P-value**
ICH Score	**0**	15 (100%)	0	**<0.001**
	≥1	18 (51.4%)	17 (48.6%)	
Neurosurgical Intervention	**Yes (n=12)**	3 (25%)	9 (75%)	**0.04**
	No (n=48)	30 (62.5%)	18 (37.5%)	

DISCUSSION

The present study evaluated 60 patients with acute hemorrhagic stroke, with a mean age of 60.02 years and male predominance (1.7:1 ratio), aligning with findings from Omkar et al.[11] and Siddique et al.[12], though contrasting with the Framingham study's[13] equal gender distribution. Hemiparesis was the most common presenting symptom (47%), consistent with multiple studies.[14,15] The study identified significant risk factors: hypertension (72%), smoking (42%), alcoholism (40%), and diabetes mellitus (25%). These findings parallel those of Daniel Woo et al.[16], who reported similar prevalence rates. The

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Melbourne Risk Factor Study Group[17] emphasized the correlation between discontinuation of antihypertensive medication and increased stroke risk, while T Kurth et al.[18] confirmed smoking as a significant risk factor.

CT findings revealed gangliocapsular region as the most common site of hemorrhage (41.7%), followed by lobar (26.7%) and thalamic regions (16.7%), consistent with standard literature.[19] The study identified several statistically significant predictors of poor outcome: Glasgow Coma Scale score ($p<0.0000001$), hemorrhage volume >30cc ($p=0.000006$), presence of intraventricular hemorrhage ($p=0.025$), and midline shift ($p=0.0003$). These findings align with previous studies.[20-26] that established similar prognostic indicators. The ICH score demonstrated significant correlation with outcomes ($p=0.00092$), confirming its value in risk stratification and prognosis prediction, as validated by independent cohorts.[27]

Notably, factors such as age, gender, diabetes mellitus, and hypertension did not significantly influence outcomes in our study, contrasting with some previous research.[28,29] This divergence might be attributed to our sample size and study duration limitations. Temperature and mean arterial pressure also showed no significant correlation with outcomes, though Schwarz [28] and others reported fever as an independent predictor of worse outcomes. The study highlighted the importance of neurosurgical intervention when indicated ($p=0.04$), supporting current care guidelines [30] recommending aggressive initial treatment regardless of admission factors, while maintaining neurosurgery as a crucial second-tier management option.

CONCLUSION

Acute hemorrhagic stroke remains a significant cause of mortality and morbidity, predominantly affecting males in their sixth decade of life. Our study identified several critical prognostic factors: Glasgow Coma Scale score, hemorrhage volume, intraventricular extension, and midline shift. The ICH score proved to be a valuable tool for risk stratification and outcome prediction. While traditional risk factors like hypertension were common, their presence didn't significantly influence outcomes. Early recognition of poor prognostic factors can guide aggressive management strategies and appropriate neurosurgical intervention when indicated. Further large-scale studies are warranted to validate these findings and establish standardized management protocols.

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