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Clinical Profile and Functional Outcomes of Acute Ischaemic Stroke Patients at No. (2) Military Hospital (500-Bedded), Yangon, Myanmar

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Abstract

Stroke remains a leading cause of global mortality and long-term disability, particularly in low- and middle-income countries. This study aimed to describe the clinical profile and functional outcomes of patients with acute ischaemic stroke and to evaluate the association between admission stroke severity and functional outcomes. A hospital-based observational study was conducted at No. (2), Military Hospital (500-Bedded), Yangon, Myanmar, including 86 patients with imaging-confirmed acute ischaemic stroke recruited using consecutive sampling. Stroke severity was assessed at admission using the National Institutes of Health Stroke Scale (NIHSS), and functional outcomes at discharge were evaluated using the Modified Rankin Scale (mRS). Data were analysed using SPSS, with statistical significance set at $p < 0.05$. The mean age of patients was 67.6 ± 9.4 years, with a predominance of females (75.6%). Hypertension and dyslipidaemia were the most common risk factors, each present in 50% of patients. Hemiparesis was the most frequent presenting symptom (100%). The majority of patients (81.4%) achieved favourable functional outcomes (mRS 0–2). Although a trend toward poorer outcomes with increasing NIHSS scores was observed, the association was not statistically significant ($p = 0.278$). In conclusion, patients with acute ischaemic stroke in this setting were predominantly elderly and had a high burden of vascular risk factors, and most achieved favourable functional outcomes at discharge; however, larger studies are needed to better identify predictors of stroke outcomes.

Keywords: Stroke, Acute ischaemic stroke, NIHSS, Modified Rankin Scale, Functional outcome

1. Introduction

Stroke is one of the leading causes of death and disability worldwide and remains a major public health concern (4,6). Acute ischaemic stroke accounts for approximately 70 to 80 percent of all stroke cases and results from interruption of cerebral blood flow due to arterial occlusion (5).

The burden of stroke is disproportionately high in Southeast Asia, where rapid urbanisation and lifestyle changes have increased the prevalence of vascular risk factors such as hypertension, diabetes mellitus,

dyslipidaemia, and smoking (8). In Myanmar, stroke is a leading contributor to morbidity and mortality and constitutes a significant proportion of neurological admissions (1,9).

Assessment of stroke severity using the National Institutes of Health Stroke Scale (NIHSS) is essential for clinical evaluation and prognostication (2). Functional outcomes are commonly measured using the Modified Rankin Scale (mRS), which provides a reliable assessment of disability (7).

Despite the high burden of stroke, there is limited published data describing the clinical characteristics and functional outcomes of acute ischaemic stroke patients in Myanmar, particularly within military healthcare settings.

This study aimed to describe the clinical profile and functional outcomes of acute ischaemic stroke patients admitted to a tertiary military hospital in Myanmar and to assess the association between admission stroke severity and functional outcomes.

2. Materials and Methods

2.1 Study Design and Setting

This hospital-based observational descriptive study was conducted at No. (2) Military Hospital (500-Bedded), Yangon, Myanmar.

2.2 Study Population

Adult patients (≥18 years) with imaging-confirmed acute ischaemic stroke admitted during the study period were included.

2.3 Inclusion Criteria

- Acute ischaemic stroke confirmed by CT(Head) or MRI (Brain)
- Admission during acute phase
- Complete NIHSS and mRS data

2.4 Exclusion Criteria

- Haemorrhagic stroke, Transient ischaemic attack
- Stroke mimics
- Incomplete records

2.5 Sampling Method

Consecutive sampling was used, including all eligible patients (n = 86).

2.6 Data Collection

Data were collected from medical records, including demographics, risk factors, clinical presentation, imaging findings, and complications.

2.7 Outcome Measures

- Stroke severity: NIHSS
- Functional outcome: mRS

Outcome categories:
- Good: mRS 0–2
- Poor: mRS 3–6

2.8 Statistical Analysis
- Mean ± SD for continuous variables
- Frequencies and percentages for categorical variables
- Chi-square test for association
- Significance: $p < 0.05$

2.9 Ethical Considerations
Ethical approval was obtained from the Ethical Review Committee on Medical Research Involving Human Participants, Defence Services Medical Academy. Patient confidentiality was maintained.

3. Results

3.1 Sociodemographic Characteristics
A total of 86 patients were included in the study. The mean age was 67.6 ± 9.4 years, and the majority of patients were aged ≥60 years (81.4%). Females accounted for 75.6% of the study population.

Table 1: Sociodemographic Characteristics of Study Participants (n = 86)

Variables		**n**	**%**
Age group (years)	**18–39**	0	0
	40–59	16	18.6
	≥60	70	81.4
Gender	**Male**	21	24.4
	Female	65	75.6

3.2 Vascular Risk Factors
Hypertension and dyslipidaemia were the most prevalent risk factors, each observed in 50% of patients, followed by smoking (34.9%) and diabetes mellitus (29.1%). Previous stroke or transient ischaemic attack was present in 12.8% of patients, while atrial fibrillation and ischaemic heart disease were less common, occurring in 7.0% and 4.7% of patients, respectively.

Table 2: Vascular Risk Factors and Past Medical History (n = 86)

Risk Factors	**n**	**%**
Hypertension	43	50
Diabetes mellitus	25	29.1
Dyslipidaemia	43	50
Smoking	30	34.9
Atrial fibrillation	6	7
Previous stroke/TIA	11	12.8

Ischaemic heart disease	4	4.7

3.3 Clinical Presentation

Hemiparesis was present in all patients (100%). Speech disturbance was observed in 43% of cases, while altered consciousness was noted in 16.3% of patients.

Table 3: Clinical Presentation and Admission Characteristics (n = 86)

Presenting symptoms		n	%
Hemiparesis		86	100
Speech disturbance		37	43
Altered consciousness		14	16.3
Visual disturbance		0	0
Blood pressure at admission	Normal	5	5.8
	Elevated	38	44.2
Random blood glucose elevated		19	22.1

3.4 Neuroimaging Findings

Neuroimaging findings showed that multiple territory infarctions were the most common pattern (48.8%), followed by lacunar infarctions (36.0%), while involvement of the anterior cerebral artery (11.6%) and middle cerebral artery (3.5%) territories was less frequent, and no cases of posterior cerebral artery involvement were observed.

Table 4: Neuroimaging Findings (n = 86)

Territory Involvement	n	%
Middle Cerebral Artery territory	3	3.5
Anterior Cerebral Artery territory	10	11.6
Posterior Cerebral Artery territory	0	0
Lacunar infarction	31	36
Multiple territories	42	48.8

3.5 In-Hospital Complications

Aspiration pneumonia was the most common in-hospital complication, occurring in 15.5% of patients, followed by urinary tract infection (7.0%) and seizures (2.3%). No cases of haemorrhagic transformation or deep vein thrombosis were observed.

Table 5: In-Hospital Complications (n = 86)

Complications	n	%
Aspiration pneumonia	13	15.5
Urinary tract infection	6	7
Seizures	2	2.3

Hemorrhagic transformation	0	0
Deep vein thrombosis	0	0

3.6 Functional Outcomes

At discharge, the majority of patients had slight disability (mRS 2) (70.9%), followed by moderate disability (mRS 3) (18.6%) and no significant disability (mRS 1) (10.5%). No patients had mRS scores of 0, 4, 5, or 6.

Table 6: Functional Outcome at Discharge Based on mRS (n = 86)

mRS Score	Functional Status	n	%
0	**No symptoms**	0	0
1	**No significant disability**	9	10.5
2	**Slight disability**	61	70.9
3	**Moderate disability**	16	18.6
4	**Moderately severe disability**	0	0
5	**Severe disability**	0	0
6	**Death**	0	0

To further simplify interpretation, outcomes were categorised into good and poor outcomes.

Table 7: Categorised Functional Outcome (n = 86)

Outcome Category	n	%
Good outcome (0–2)	70	81.4
Poor outcome (3–6)	16	18.6

3.7 Association Between NIHSS and Functional Outcome

Patients with lower NIHSS scores (minor and moderate categories) were more likely to have good functional outcomes, whereas a higher proportion of poor outcomes was observed among patients with moderate stroke severity. However, although a trend toward poorer outcomes with increasing NIHSS scores was noted, the association was not statistically significant (p = 0.278).

Table 8: Association Between Admission NIHSS and Functional Outcome

NIHSS Category	Good Outcome n (%)	Poor Outcome n (%)	Total	p-value
Minor (0–4)	36 (51.4%)	6 (37.5%)	42 (48.8%)	0.278
Moderate (5–15)	27 (38.6%)	10 (62.5%)	37 (43%)	
Moderate–severe (16–20)	4 (5.7%)	0 (0%)	4 (4.7%)	
Severe (>20)	3 (4.3%)	0 (0%)	3 (3.5%)	
Total	70 (100%)	16 (100%)	86 (100%)	

Statistical test: Chi-square

4. Discussion

This study demonstrates that acute ischaemic stroke predominantly affects elderly individuals, which is consistent with global and regional findings indicating that stroke incidence increases with age due to cumulative vascular risk exposure (4,6). The high proportion of patients aged ≥60 years in this study reflects the ageing population and increasing burden of non-communicable diseases in Myanmar.
Interestingly, a predominance of female patients was observed, which contrasts with many studies reporting higher stroke incidence in males. This difference may be attributable to local demographic patterns, differences in healthcare-seeking behaviour, or survival bias among elderly female populations. Further population-based studies are needed to clarify sex-related differences in stroke epidemiology in Myanmar.

Hypertension and dyslipidaemia were identified as the most prevalent risk factors, each affecting 50% of patients. This finding aligns with existing evidence that hypertension is the most important modifiable risk factor for stroke worldwide (8,12). The high prevalence of smoking and diabetes mellitus further highlights the substantial burden of modifiable vascular risk factors in this population. These findings underscore the need for effective primary prevention strategies, including blood pressure control, lipid management, and lifestyle modification.

In terms of clinical presentation, hemiparesis was present in all patients, reaffirming its role as the most common presenting symptom of acute ischaemic stroke. The presence of speech disturbance and altered consciousness in a significant proportion of patients suggests varying levels of neurological involvement and stroke severity at presentation.

Neuroimaging findings revealed a predominance of multiple territory infarctions, followed by lacunar infarctions. This pattern may suggest a possible contribution of cardioembolic sources or widespread vascular pathology. Similar patterns have been reported in regional studies of stroke aetiology (8).

Aspiration pneumonia was the most common in-hospital complication, consistent with previous studies demonstrating its association with increased morbidity in stroke patients (7). This highlights the importance of early dysphagia screening, appropriate feeding strategies, and preventive care to reduce complication rates and improve outcomes.

Regarding functional outcomes, the majority of patients achieved favourable outcomes at discharge, with most classified as having slight disability (mRS 2). This suggests that a significant proportion of patients retained functional independence despite residual symptoms. Comparable findings have been reported in previous stroke outcome studies (7).

Although a trend toward poorer functional outcomes with increasing NIHSS scores was observed, the association did not reach statistical significance. This contrasts with previous studies demonstrating a strong predictive relationship between NIHSS and outcomes (2,7). The lack of statistical significance in this study may be due to the relatively small sample size, limited representation of severe stroke cases, or uneven distribution of NIHSS categories.

Overall, these findings highlight the importance of early clinical assessment, risk factor management, and supportive care in improving stroke outcomes. They also emphasise the need for strengthening stroke care systems, including early diagnosis, multidisciplinary management, and rehabilitation services, particularly in resource-limited settings such as Myanmar.

5. Conclusion

Acute ischaemic stroke in this setting predominantly affects elderly individuals with a high burden of modifiable vascular risk factors. Most patients achieved favourable functional outcomes at discharge despite mild residual disability. Although higher NIHSS scores showed a trend toward poorer outcomes, the association was not statistically significant. These findings highlight the importance of early assessment, risk factor control, and multidisciplinary care. Further multicentre studies are needed to better understand predictors of stroke outcomes in Myanmar.

6. Limitations

- Single-centre study
- Small sample size
- No long-term follow-up

7. Recommendations

- Conduct multicentre studies
- Strengthen stroke prevention strategies
- Improve rehabilitation services
- Establish dedicated stroke units

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