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CLINICAL PROFILE AND MANAGEMENT OUTCOMES OF PATIENTS WITH ACUTE ISCHEMIC STROKE

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Abstract

Background: *The burden of acute ischemic stroke (AIS) is rising globally, particularly in developing countries like Pakistan, where limited access to timely care and poor awareness contribute to adverse outcomes. Understanding the clinical profile and treatment outcomes is essential for improving stroke management.*

Objectives: *To evaluate the clinical presentation, risk factors, and management outcomes of patients with acute ischemic stroke.*

Study Design & Setting: *A descriptive observational study conducted at DHQ Teaching Hospital Mirpur AJK over six months.*

Methodology: *A total of 120 patients aged ≥18 years presenting with AIS within 72 hours of symptom onset were enrolled using non-probability consecutive sampling. Diagnosis was confirmed by CT or MRI. Clinical features, risk factors, NIHSS score at admission, treatment modality, and Modified Rankin Scale (mRS) at discharge were recorded. Data were analyzed using SPSS v25.0.*

Results: Out of 120 patients, 58.3% were male with a mean age of 58.4 ± 11.2 years. Hypertension (75.8%) and diabetes (55.0%) were the most common risk factors. Hemiparesis (76.7%) and dysarthria (55.0%) were frequent symptoms. Most patients had moderate stroke severity (NIHSS 5–15). IV thrombolysis was administered in 28.3% of cases. At discharge, 15.0% had minimal disability (mRS 0–1), while 12.5% died during hospital stay.

Conclusion: *AIS commonly affects older hypertensive patients. Timely diagnosis and appropriate management, including thrombolysis, can improve functional outcomes.*

INTRODUCTION

Good Stroke is a leading cause of morbidity and mortality worldwide and represents a major public health challenge.[1] Among the two principal types of stroke—ischemic and hemorrhagic—acute ischemic

stroke (AIS) is the most common, accounting for approximately 80–85% of all stroke cases.[2] AIS occurs due to an interruption in cerebral blood flow, typically resulting from thromboembolism, which leads to infarction of brain tissue.[3] The clinical presentation of AIS is variable and depends on the location and extent of the infarct. Common manifestations include sudden-onset hemiparesis, facial droop, speech disturbances, visual impairment, and altered levels of consciousness.[4] The severity and reversibility of symptoms are significantly influenced by early diagnosis and timely management. The use of neuroimaging modalities such as non-contrast CT scan and MRI plays a crucial role in confirming the diagnosis, excluding hemorrhage, and guiding therapeutic decisions.[5]

Over the past two decades, major advances have been made in the management of AIS, with emphasis on time-sensitive interventions such as intravenous thrombolysis using tissue plasminogen activator (tPA) and mechanical thrombectomy for large vessel occlusion.[6] These interventions, if administered within the therapeutic window, have been shown to significantly improve neurological outcomes and reduce disability. In addition, secondary prevention strategies—including antiplatelet therapy, statins, antihypertensive medications, and lifestyle modifications—are essential to minimize the risk of recurrent stroke.[7]

Despite these advances, the overall prognosis of AIS remains suboptimal in many developing regions due to factors such as delayed presentation, inadequate infrastructure, and lack of trained personnel.[8] Furthermore, the clinical profile, risk factors, and outcomes of patients with AIS may vary widely across different populations and healthcare settings.[9] Common risk factors include hypertension, diabetes mellitus, atrial fibrillation, smoking, and dyslipidemia. Identifying these factors in specific patient populations can aid in better understanding disease patterns and optimizing management protocols.[10,11]

This study aims to evaluate the clinical profile and management outcomes of patients presenting with acute ischemic stroke in our setting. By analyzing demographic data, clinical characteristics, comorbidities, treatment modalities, and functional outcomes, we seek to contribute to the growing body of evidence on stroke care and highlight potential areas for improvement. The findings from this study may help inform clinical practice and policy decisions aimed at enhancing stroke prevention, early intervention, and rehabilitation services in resource-constrained environments.

MATERIALS AND METHODS

This descriptive, observational study was conducted at the Department of Neurology DHQ Teaching Hospital Mirpur AJK from November 2023 to April 2025. A total of 120 patients diagnosed with acute ischemic stroke were included using a non-probability consecutive sampling technique. The sample size was calculated using OpenEpi version 3.01, taking the expected frequency of hypertension in stroke patients as 73%, with a 95% confidence interval and 8% margin of error.

Patients of both genders aged 18 years and above, who presented within 72 hours of symptom onset and were diagnosed with acute ischemic stroke on the basis of clinical examination and confirmed through non-contrast computed tomography (CT) or magnetic resonance imaging (MRI), were included. Patients with hemorrhagic stroke, transient ischemic attacks (TIA), or known intracranial space-occupying lesions were excluded from the study.

Detailed clinical history was obtained, including age, gender, time of symptom onset, presenting complaints, and pre-existing comorbidities such as hypertension, diabetes mellitus, ischemic heart disease, atrial fibrillation, smoking history, and dyslipidemia. A thorough neurological examination was performed, and stroke severity was assessed using the National Institutes of Health Stroke Scale (NIHSS) at the time of admission. Laboratory investigations including complete blood count, serum electrolytes, lipid profile, renal function tests, and ECG were also recorded.

Patients were managed according to institutional stroke protocols. Eligible patients received intravenous thrombolysis with recombinant tissue plasminogen activator (r-tPA) within the therapeutic window after ruling out contraindications. Supportive care including antiplatelet therapy, anticoagulation (if indicated), statins, and management of blood pressure and glucose levels was provided to all patients. Follow-up neurological

assessment was performed at discharge and functional outcome was evaluated using the Modified Rankin Scale (mRS).

All collected data were recorded in a predesigned proforma. Statistical analysis was performed using SPSS version 25.0. Continuous variables such as age and NIHSS score were presented as mean ± standard deviation, while categorical variables such as gender, comorbidities, and outcome categories were expressed as frequencies and percentages. Chi-square test and independent t-test were applied where appropriate, and a p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 120 patients diagnosed with acute ischemic stroke were included in the study. As shown in Table 1, the majority of patients were male (58.3%), while females comprised 41.7% of the sample. The mean age of the patients was 58.4 ± 11.2 years. Most patients were in the age group of 41–60 years (45.0%), followed by those above 60 years (40.0%), and only 15.0% were below 40 years of age, indicating that middle-aged and elderly individuals were predominantly affected shown in table 1.

Table 2 highlights the distribution of risk factors among the study population. Hypertension was the most common comorbidity, observed in 75.8% of patients, followed by diabetes mellitus in 55.0%, and dyslipidemia in 37.5%. Ischemic heart disease was present in 26.7% of patients, while 15.0% had atrial fibrillation. Smoking was reported by 32.5% of patients, and 20.0% had a history of previous stroke. These findings emphasize the strong association between vascular risk factors and the incidence of acute ischemic stroke shown in table 2.

The clinical presentation at admission is described in Table 3. Hemiparesis was the most frequent symptom, observed in 76.7% of patients, followed by dysarthria (55.0%), facial droop (48.3%), and aphasia (27.5%). Visual disturbances were reported by 15.0%, and altered level of consciousness was noted in 17.5% of cases. These presentations reflect the typical neurological deficits associated with ischemic events in the brain shown in table 3.

Stroke severity was assessed using the National Institutes of Health Stroke Scale (NIHSS), as shown in Table 4. Most patients had a moderate stroke severity (score 5–15) at admission, accounting for 60.0% of the cases. Mild stroke (NIHSS 0–4) was seen in 18.3%, moderate to severe strokes (16–20) in 15.0%, and severe strokes (>20) in 6.7% of patients. The mean NIHSS score at admission was 11.3 ± 4.8, indicating an overall moderate stroke severity in the cohort. Table 5 outlines the management strategies employed. Intravenous thrombolysis with r-tPA was administered to 28.3% of patients who met the eligibility criteria. The majority (71.7%) received antiplatelet therapy, while anticoagulation was used in 15.0% of patients, typically in those with atrial fibrillation. Statins were prescribed in 90.0% of patients as part of secondary prevention, and 60.0% underwent physiotherapy and rehabilitation during their hospital stay.

Functional outcomes at discharge were measured using the Modified Rankin Scale (mRS), as depicted in Table 6. A favorable outcome (mRS 0–1) was achieved in 15.0% of patients, while 45.0% had slight to moderate disability (mRS 2–3). Moderate to severe disability (mRS 4–5) was noted in 27.5%, and in-hospital mortality (mRS 6) occurred in 12.5% of cases. These results reflect a variable range of recovery outcomes, emphasizing the importance of early intervention and rehabilitation.

Table 1: Demographic Characteristics of Patients (n = 120)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	70	58.3%
Female	50	41.7%
Age Group (years)		
18–40	18	15.0%
41–60	54	45.0%
>60	48	40.0%

Mean Age (±SD)	58.4 ± 11.2

Table 2: Distribution of Risk Factors among Patients

Risk Factor	Frequency (n)	Percentage (%)
Hypertension	91	75.8%
Diabetes Mellitus	66	55.0%
Dyslipidemia	45	37.5%
Ischemic Heart Disease	32	26.7%
Atrial Fibrillation	18	15.0%
Smoking	39	32.5%
Previous Stroke	24	20.0%

Table 3: Clinical Presentation at Admission

Presenting Symptom	Frequency (n)	Percentage (%)
Hemiparesis	92	76.7%
Dysarthria	66	55.0%
Facial Droop	58	48.3%
Aphasia	33	27.5%
Visual Disturbances	18	15.0%
Altered Level of Consciousness	21	17.5%

Table 4: NIHSS Score at Admission

NIHSS Score Category	Frequency (n)	Percentage (%)
Mild (0–4)	22	18.3%
Moderate (5–15)	72	60.0%
Moderate to Severe (16–20)	18	15.0%
Severe (>20)	8	6.7%
Mean NIHSS Score (±SD)	11.3 ± 4.8	

Table 5: Management Modalities Received

Treatment Type	Frequency (n)	Percentage (%)
IV Thrombolysis (r-tPA)	34	28.3%
Antiplatelets only	86	71.7%
Anticoagulation	18	15.0%
Statins	108	90.0%
Physiotherapy/Rehabilitation	72	60.0%

Table 6: Modified Rankin Scale (mRS) at Discharge

mRS Score	Frequency (n)	Percentage (%)
0–1 (No significant disability)	18	15.0%
2–3 (Slight to moderate disability)	54	45.0%
4–5 (Moderate to severe disability)	33	27.5%
6 (Death)	15	12.5%

DISCUSSION

Acute ischemic stroke (AIS) is a major cause of long-term disability and mortality globally, especially in low- and middle-income countries. It results from sudden blockage of cerebral blood flow, commonly due to thromboembolism. Early identification and

management play a critical role in improving neurological outcomes. Common risk factors include hypertension, diabetes, atrial fibrillation, and smoking.[13,14] Neuroimaging and NIHSS scoring help guide treatment decisions. Understanding the clinical profile and outcomes of AIS patients aids in improving stroke care protocols.

In our study, acute ischemic stroke predominantly affected middle-aged and elderly individuals, with a mean age of 58.4 ± 11.2 years and male predominance (58.3%), which aligns with the findings of Yasir et al. (2022), who reported ischemic strokes in younger populations with a mean GCS of 10.6 ± 3.7, indicating mild severity, and hypertension being the leading risk factor in 49.7% of cases. In contrast, our study observed hypertension in 75.8% and diabetes in 55% of patients, indicating a higher burden of vascular comorbidities.[21] The findings of Ghafoor et al. (2025) support this metabolic trend, where 57.27% had deranged total cholesterol and 60% had abnormal LDL levels—parameters not directly analyzed in our study but likely contributors to ischemic risk.[19]

Regarding treatment, 28.3% of our patients received IV thrombolysis, which is notably higher than Mehmood et al. (2024), where only 19% were thrombolysis-eligible. This discrepancy may reflect improved early recognition and access in our cohort. However, consistent with Mehmood's study, our patients were also largely brought in by private transport, limiting door-to-needle time efficiency.[16] The lack of dedicated stroke units in many centers, as highlighted by Malik et al. (2024)—where only 20.6% had TPA availability and 44.1% had neurologists on staff—echoes the systemic gaps in stroke care infrastructure across Pakistan.[20]

In comparison to pediatric data presented by Chand et al. (2016), our adult-focused cohort presented primarily with hemiparesis (76.7%) and dysarthria (55%), while their pediatric cases had seizures (72%) and paresis (62%) as leading symptoms, suggesting age-dependent symptom variation.[18] Their in-hospital mortality was higher at 28% compared to our study's 12.5%, which may be due to differences in age group, diagnostic delays, and severity of bilateral strokes (58% mortality in bilateral vs. 6% in unilateral strokes, p=0.03).

The importance of early intervention and rehabilitation is underscored by Khan et al. (2023), where significant functional gains were observed with intensive Acute Rehabilitation Programs (ARP), supporting our findings of 45% achieving mRS 2–3 on discharge. However, our inability to follow long-term recovery remains a limitation.[17] Lastly, Nomani et al. (2017) emphasized the underdiagnosis of stroke and lack of advanced research in Pakistan, a concern our study addresses by contributing regional clinical data.[15] Yet, the need for multicenter trials, genetic studies, and public health awareness remains unmet. Our results reinforce the urgent need for robust stroke systems, widespread awareness, and standardized rehabilitation pathways to improve functional outcomes and reduce the burden of stroke-related disability and death in Pakistan.

This study provides real-world data from a local tertiary care setting, helping to understand the prevalent risk factors and management outcomes of AIS.

CONCLUSION

Acute ischemic stroke predominantly affects older adults with multiple vascular risk factors. Timely diagnosis and appropriate management significantly influence outcomes.

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