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Barriers to Timely Thrombolysis in Acute Ischemic Stroke: A Narrative Audit from a Tertiary Stroke Center in Northeast India

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Abstract: Background: Intravenous thrombolysis remains the most effective time-dependent treatment for acute ischemic stroke, yet a majority of eligible patients in India miss this window. Understanding local barriers can inform interventions to improve access.
Objective: To explore systemic, logistical, and social barriers to thrombolysis in patients presenting with acute ischemic stroke.
Methods: This narrative audit included retrospective evaluation of stroke admissions over a 2-year period at a tertiary care center in Northeast India. Non-thrombolysed ischemic stroke patients were analyzed to identify patterns of delay and ineligibility.
Results: Approximately 60% of ischemic stroke patients were not thrombolysed. Key barriers included delayed hospital arrival (>4.5 hours), referral delays, lack of neuroimaging at primary centers, and poor stroke awareness. In two illustrative cases, thrombolysis was missed due to delayed referral and absence of transport from rural areas.
Conclusion: Community-level awareness, emergency medical services, and stroke-ready infrastructure are essential to improve thrombolysis rates in resource-limited settings.
Keywords: Thrombolysis, Stroke, Barriers, Rural healthcare, Audit, India

I. Introduction

Acute ischemic stroke (AIS) is one of the leading causes of death and disability in India. Intravenous thrombolysis, when administered within 4.5 hours of symptom onset, can significantly improve functional outcomes. However, in real-world practice, the proportion of eligible patients receiving thrombolysis remains alarmingly low.

Identifying and addressing barriers that hinder timely thrombolysis is a crucial step in reducing stroke-related disability. This study aims to provide insights from a tertiary stroke center in Northeast India on why a significant number of AIS patients miss this therapeutic window.

II. Materials and Methods

A narrative audit was conducted over a 2-year period (2023–2024) at Gauhati Medical College Hospital (GMCH), Assam. Records of patients admitted with a diagnosis of acute ischemic stroke were retrospectively reviewed.

Patients who did not undergo thrombolysis were analyzed for reasons including time delay, referral lag, systemic ineligibility, and infrastructural constraints. Descriptive summaries and two representative anonymized cases were included to highlight key barriers.

III. Results

Out of the estimated ischemic stroke cohort managed at GMCH over the study period, approximately 60–70% of patients were not thrombolysed despite being potentially eligible. The leading barriers identified were:

- Delayed presentation to hospital (>4.5 hours from onset)
- Referral delays from primary and secondary centers
- Absence of neuroimaging facilities at initial contact centers
- Lack of public awareness regarding stroke symptoms and urgency
- Financial or transport constraints in rural areas

IV. Illustrative Case Vignettes

Case 1: A 56-year-old farmer from lower Assam developed right hemiparesis at 4 AM but arrived at GMCH only at 2 PM due to referral delay and absence of CT scan at the district hospital. He was diagnosed with left MCA infarct and missed the thrombolysis window.

Case 2: A 68-year-old female from a tribal village presented with slurred speech and left-sided weakness but reached GMCH after 12 hours due to lack of ambulance services. CT revealed right MCA infarct. She was managed conservatively with antiplatelets.

V. Discussion

This audit underscores the multifactorial challenges in ensuring timely thrombolysis in AIS. Most patients arrived beyond the therapeutic window primarily due to delayed recognition, referral bottlenecks, and poor infrastructure.

These findings are consistent with national reports where less than 10–15% of AIS patients in India receive thrombolysis. Public education campaigns, decentralized stroke-ready centers, and pre-hospital emergency services are vital steps to improve thrombolysis access in resource-constrained settings.

VI. Conclusion

Systemic, infrastructural, and social barriers continue to limit access to thrombolysis in rural and semi-urban India. Targeted efforts to improve stroke awareness, referral efficiency, and infrastructure are urgently needed.

Declarations

Funding: None Conflict of Interest: None declared Ethical Approval: Not required (audit-based retrospective study) Consent: Not applicable Data Availability: Available on request

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