

Mild Stroke and Advanced Age Are the Major Reasons for Exclusion from Thrombolysis in Stroke Patients Admitted within 4.5 Hours

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Background: Only 2%-3% of patients with acute ischemic stroke receive thrombolysis. The aim of this study was to identify the reasons for exclusion from thrombolysis in patients admitted within the therapeutic time window. *Methods:* Patient data in the hospital stroke registry between January 2012 and September 2013 were retrospectively examined. All cases with a diagnosis of ischemic stroke were screened, and those admitted to the neurology wards within 4.5 hours of symptom onset were analyzed. The reasons for exclusion from thrombolysis were examined. Logistic regression analysis was used to find independent predictors of thrombolysis treatment. *Results:* Of the 1579 cases of ischemic stroke, 234 patients were admitted to the neurology ward within 4.5 hours of symptom onset. A total of 57 patients received thrombolysis. The thrombolysis rate was 3.6% of all ischemic stroke patients. Of the 177 patients who were excluded from thrombolysis, 36.2% (n = 64) had stroke of insufficient severity to warrant thrombolysis, and 24.9% (n = 44) were older than 80 years. Logistic regression analysis showed that the interval between symptom onset and admission (odds ratio 20.24, 95% confidence interval 3.75-109.24) and history of ischemic stroke (odds ratio .11, 95% confidence interval .04-.34) affected the likelihood of thrombolysis. *Conclusions:* Mild stroke and advanced age were the major reasons for exclusion from thrombolysis in patients admitted within 4.5 hours of symptom onset. Patients who were admitted early and those without a history of ischemic stroke were more likely to receive thrombolysis. **Key Words:** Thrombolysis—ischemic stroke—mild stroke—advanced age.

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Although intravenous thrombolysis using recombinant tissue plasminogen activator (rtPA) is a proven therapy for acute ischemic stroke,^{1,2} only 2%-3% of all ischemic stroke patients receive this treatment.^{3,4} Previous studies attributed the low thrombolysis rate to the narrow therapeutic time window of 3 hours—which

has been recently expanded to 4.5 hours—and delayed hospitalization.^{4,5} A large proportion of stroke patients who received timely medical attention also did not receive thrombolysis.⁴ A thorough understanding of the reasons for the underuse of thrombolysis therapy may contribute to an increase in the thrombolysis rate and provide information for future studies. Few studies have addressed this issue, and most were based on the 3-hour time window.

We retrospectively analyzed the medical records of ischemic stroke patients who were admitted within 4.5 hours of symptom onset using a registered database to identify possible reasons for the underuse of thrombolysis. We also examined the characteristics of reperfused and nonreperfused patients who were eligible for reperfusion to identify predictors of thrombolysis.

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Methods

Study Design

This study was a retrospective analysis of ischemic stroke patients who were admitted within 4.5 hours of stroke onset. The reasons for exclusion from thrombolysis were recorded and the data of patients eligible for thrombolysis were analyzed to identify predictors.

Study Setting and Population

An intrahospital stroke code team was created in 2011 at our institution, which has a catchment area of 1.4 million inhabitants in the city of Nanjing. Data from January 2012 to September 2013 were retrieved from the database and examined, and patients with a final discharge diagnosis other than ischemic stroke were excluded from the study. The records of patients diagnosed with ischemic stroke were screened and those admitted to the neurology ward within 4.5 hours of stroke onset were analyzed.

Study Protocol

Patients exhibiting symptoms of stroke were assessed initially by the emergency department physicians. Once the head computed tomography (CT) was completed, the patient was transferred to the neurology ward, and the diagnosis was confirmed by a neurologist. The decision to perform thrombolysis was based on the Chinese

guidelines for management of acute ischemic stroke.⁶ Intra-artery thrombolysis and other endovascular treatment were not performed in our center. Patients were considered eligible for thrombolysis if they satisfied the eligibility criteria of the guidelines, and no contradiction was present. The following information was available in the database: age, sex, time of onset of symptoms and arrival at the neurology ward, stroke symptoms, medical history, National Institutes of Health Stroke Scale (NIHSS) score on admission, and reasons for exclusion from thrombolysis. A stroke study nurse completed a standardized study form and another nurse entered the data into the computerized database. A monthly review meeting was held to discuss whether reperfusion therapy or nonreperfusion therapy had been appropriate. The local ethics committee approved this study.

Measurements

The main outcome measure was identification of the reasons for exclusion from thrombolysis. The secondary outcome measure was the difference in patient characteristics between reperfused and nonreperfused stroke patients who were eligible for thrombolysis.

Data Analysis

For descriptive analysis, categorical and continuous data were presented as percentages and mean \pm SD, respectively. The reasons for exclusion were presented in

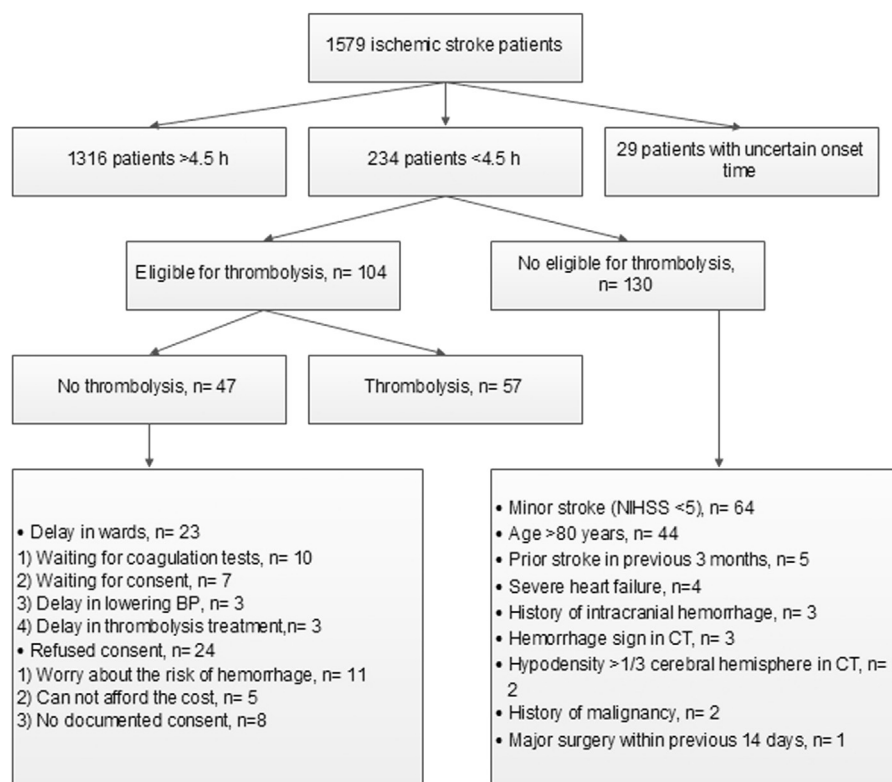


Figure 1. Flow diagram of ischemic stroke cases and reasons for exclusion from thrombolysis. Abbreviations: BP, blood pressure; CT, computed tomography; NIHSS, National Institutes of Health Stroke Scale.

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