Evaluation of Safety and Efficacy of Tenecteplase for Acute Ischemic Strokes: A Retrospective Study

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Abstract

Purpose: Current stroke guidelines list alteplase as the standard of care fibrinolytic for the treatment of acute ischemic stroke. However, there is ongoing research to determine if tenecteplase, another fibrinolytic, has comparable safety and efficacy for the use in acute ischemic stroke for thrombolysis. Several HSHS Hospitals, including St. Elizabeth's Hospital, switched from alteplase to tenecteplase for acute ischemic stroke on March 30, 2022. This study aims to assess the use of and provide data on the use, safety, and efficacy of tenecteplase in acute ischemic stroke patients at St. Elizabeth's Hospital since this transition occurred.

Methods: Patients at St. Elizabeth's who were ≥ 18 years old who received tenecteplase for presumed or confirmed acute ischemic stroke between March 30, 2022 and September 15, 2022 were included in this retrospective chart review. Patients who were < 18 years old, did not receive tenecteplase, or who received tenecteplase for an indication other than presumed/confirmed ischemic stroke were excluded from this study. Because this was a retrospective chart review, participants were not recruited. If a patient met the inclusion criteria, data were gathered from their hospital electronic medical record. Information gathered from the electronic medical record included age, sex, race, weight at time of tenecteplase given, dose ordered, dose given, National Institute of Health Stroke Scale (NIHSS) baseline score, NIHSS follow-up score, history of previous stroke/transient ischemic attack, potential cause, past medical history (diabetes, hypertension, hyperlipidemia, atrial fibrillation), smoking status, glucose level, if currently on antiplatelets or anticoagulants, door to needle time, bleeding adverse events, Modified Rankin Scale score, if they were sent out for mechanical reperfusion, and if death occurred. Descriptive statistics were used to analyze the data. The institutional review board (IRB) approved this study.

Results: Thirteen patients were included in this study, with ages ranging from 41 to ≥ 90 years old (average 63.7 years old). The weight at the time of tenecteplase given ranged from 52.6 kg to 121.7 kg (average 89.5 kg). All ordered and given doses were calculated appropriately, with six (46.2%) patients receiving the maximum dose of 25 mg. Door to needle time ranged from 21 minutes to 265 minutes; five (38.5%) were < 60 minutes, five (38.5%) were 60 to 90 minutes, and three (23.1%) were > 90 minutes. Baseline NIHSS ranged from one to 35 (average 12) and follow-up NIHSS ranged from zero to 31 (average 7.8). Change in score ranged from -10 to +5 with an average change of -3.5. Six (46.2%) patients were sent for mechanical reperfusion while seven (53.8%) patients were not sent for mechanical reperfusion. One (7.7%) patient died, and one (7.7%) patient did not have a cardiovascular accident (CVA) as they had negative CTs and MRI. Due to the inability to access outside records, only nine patients had bleeding outcomes assessed. Of these nine patients, there was one (11.1%) bleeding adverse event.

Conclusion: Tenecteplase use for acute ischemic stroke at HSHS St. Elizabeth's Hospital shows promising safety and efficacy results. This study also found that 46.2% of patients were transferred for potential mechanical reperfusion. However, the sample size was small so larger follow-up studies should be completed in order to confirm these results.