Thrombolytic Therapy for Acute Stroke in Late Pregnancy With Intra-Arterial Recombinant Tissue Plasminogen Activator

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Background and Purpose—The most common presentation of ischemic stroke related to pregnancy is arterial occlusion, occurring during the third trimester or postpartum. The authors present the first successful administration of intra-arterial cerebral tissue plasminogen activator to treat an embolic cerebral vascular accident in a 37-week parturient resulting in complete recovery of neurological function.

Methods—The patient presented with left hemiplegia, left-sided neglect, and aphasia. Right internal carotid artery cerebral angiogram showed occlusion of the mid-M1 segment of the middle cerebral artery (MCA). After 15 mg of tissue plasminogen activator was administered via intra-arterial route, there was greatly improved retrograde flow through the posterior communicating artery and the MCA territory.

Results—A reduction in size of the MCA occlusion was noted with improvement of antegrade flow through the MCA. Three days after the procedure, the patient was induced successfully and delivered a healthy infant vaginally.

Conclusion—This report describes the use of intra-arterial tissue plasminogen activator in the setting of stroke in late pregnancy. (Stroke. 2005;36:e53-e55.)

Key Words: cerebral angiography ■ cerebral infarction ■ thrombolytic therapy ■ tissue plasminogen activator
catheter (Cordis Neurovascular) over an Agility 10 wire (Cordis Neurovascular). Five hours after the symptom onset, rtPA was administered. The distal MCA was laced with 2 mg rtPA. The catheter was then withdrawn into the thrombus, and 1 mg was administered. The catheter tip was positioned proximal to the occlusion, and an additional 1 mg was administered over 3 minutes.

After the first 4 mg rtPA, there was flow in a previously occluded posterior communicating artery, with improved collateral filling of the distal MCA branches, specifically from posterior cerebral artery collaterals. Minimal improvement was noted in the antegrade flow in the M2 branches. After 10 mg had been given, the patient was moving her left arm and leg spontaneously. When compared with flow after 4 mg of rtPA administration, no significant change in the occlusion of the M1 segment was noted after 10 mg and 15 mg (Figure 2). Multiple attempts at recrossing the M1 occlusion were unsuccessful, and the procedure was terminated. She was then transferred to the neurological intensive care unit.

At 9 hours after onset of symptoms, the patient’s NIHSS score was 7. Neurological examination revealed fluent speech and mild left facial paralysis, with 4 of 5 strength on the left side, and the patient was able to follow all commands. The homonomous hemianopsia had resolved, and the patient had trace inattention to the left side.

Work-up investigating the etiology of the embolic event was noncontributory. The free protein S level was 11 mg/dL (normal 60 to 140 mg/dL), and total protein S level was 73 (normal 70 to 140 mg/dL). Six weeks after the event, the free protein S was 100 mg/dL.

The patient was induced on day 3, and a healthy male infant was delivered by forceps-assisted vaginal delivery under epidural anesthesia. The patient was discharged on low–molecular weight heparin, with minimal facial and left-sided weakness. At 2-month follow-up, the child was doing well without sequelae, and the mother was neurologically normal without residual deficits.

**Discussion**

The clinical use of thrombolysis during pregnancy is not without consequences. Thrombolysis with streptokinase in pregnant women has an incidence of maternal death at 1.2%, maternal hemorrhage at 8.1%, and 5.8% incidence of fetal death.6

Despite these concerns, relatively good maternal outcomes have been reported after the use of rtPA for acute myocardial infarction (1 patient),7 pulmonary emboli (8 patients),8–12 stroke (2 patients),15,16 prosthetic valve thrombosis (9 patients),14 deep venous thrombosis (1 patient),17 and superior vena cava syndrome (1 patient; Genentech, Inc., personal written communications, 2005). Complications included placental hematoma and uterine bleeding, as well as I case each of spontaneous abortion and intrauterine fetal death (Genentech, Inc., personal written communications, 2005).
There have been 2 reports of rtPA use for acute ischemic stroke during the first trimester of pregnancy. In 1 report, using intravenous rtPA, the mother’s neurological status initially deteriorated; in the other, using arterial rtPA, maternal neurological status markedly improved. Both women delivered healthy infants.

This report is the first use of rtPA for treatment of stroke in late pregnancy. Thrombolysis with intra-arterial rtPA may prove to be a therapeutic alternative to conservative medical management for the treatment of stroke in late pregnancy.

References
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