

Case report

Successful use of intra venous tenecteplase for acute ischemic stroke in pregnancy

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ABSTRACT

Intravenous thrombolysis (IVT) with tenecteplase or alteplase is the standard of care in patients with Acute Ischemic Stroke (AIS) presenting within 3–4.5 h. However here, are no established guidelines for such treatment during pregnancy. We report a case, of AIS in third trimester of pregnancy successfully treated with Tenecteplase. To the best of our knowledge, this is the first and only case of acute ischemic stroke in pregnancy treated with Tenecteplase.

1. Introduction

Acute ischemic stroke (AIS) during pregnancy is extremely rare. While intravenous thrombolysis (IVT) with tenecteplase or alteplase is the standard of care in patients with AIS presenting within 3–4.5 h, there are no established guidelines for such treatment during pregnancy. We report a case of AIS in the third trimester of pregnancy successfully treated with tenecteplase. To the best of our knowledge, this is the first and only case of acute ischemic stroke in pregnancy treated with tenecteplase.

2. Case report

A 23-year-old primi gravida with 28 weeks of gestational age presented to emergency with history of acute onset right-sided weakness and inability to speak. There was no headache or seizure. She had no significant past medical history. On examination vital parameters: pulse 84/min, regular, BP 110/70 mmHg, respiratory rate 18 / min and temperature 98.4 °F. Neurologically, she was conscious, alert, and oriented. She had Broca's aphasia, right upper motor neuron facial palsy and right hemiplegia (grade 0/5). Her national institute of health stroke scale (NIHSS) was 14. MRI brain showed diffusion restriction in the left mid corona radiata and internal capsule in diffusion-weighted imaging. (Fig. 1). MR angiogram showed paucity of left middle cerebral artery

cortical branches.

After a detailed discussion with family members, informed consent was obtained, and intravenous tenecteplase 0.25 mg / kg was administered. The stroke onset to needle time was 3 h and 35 min. Immediate post thrombolysis MRI brain showed no large artery occlusion or hemorrhage. Over the next 12 h, she recovered from aphasia, improved in her weakness, and NIHSS was 4. Her carotid and vertebral doppler study was normal. Electrocardiogram and transthoracic echocardiogram were unremarkable. Ultrasound examination of abdomen and pelvis showed single live intra uterine fetus corresponding to 28 weeks of gestational age. Twenty-four hours post thrombolysis NIHSS score was 0. Low-dose aspirin (75 mg/day per oral) enoxaparin 0.4 mg subcutaneous once daily were started and continued throughout the pregnancy. Repeat ultrasound examination at 30 and 34 weeks of gestation showed normal development of the fetus. Anti-nuclear antibody profile, lupus anticoagulant, and anticardiolipin antibodies were negative. She was followed by the obstetrics and neurology team. She underwent emergency lower segment caesarian section because of failed induction and delivered a healthy boy weighing 3.5 kg with APGAR score 9/9/10. The time between thrombolysis and delivery was 86 days.

3. Discussion

Intravenous thrombolysis with alteplase or tenecteplase is an

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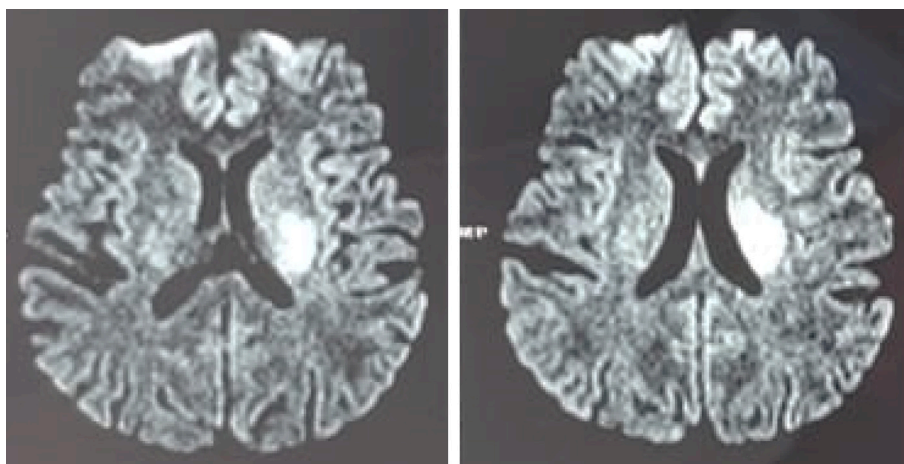


Fig 1. MRI DWI showing restricted area of diffusion in the left corona radiata and internal capsular region.

established therapy for the treatment of AIS [1]. However, pregnancy has been an exclusion criterion in all randomized control trials validating thrombolytic therapy. In pregnant patients with AIS, decision-making is complex given the inherent risk of maternal hemorrhagic complications and the lack of robust data on the possible teratogenic effect of the drugs.

Currently, there is a lack of data from controlled randomized trials involving pregnant patients developing AIS. The largest number of patients so far was included in the US stroke registry, Get With The Guidelines (GWTG), where pregnant or postpartum (< 6 weeks) women were compared with non-pregnant women. This cohort showed no cases of major systemic bleeding or in-hospital mortality, and there was no increase in adverse events compared to the non-pregnant cohort [2]. To date, only case reports have been published in addition to these results. To the best of our knowledge, there have been 17 case studies of patients treated with IV rt-PA and four case studies on endovascular treatment alone or in combination with IV rt-PA [3].

When it comes to the last trimester of pregnancy, there are only three case reports of the use of alteplase and no published reports on tenecteplase in AIS during pregnancy. Mantoan et al., 2014 reported a case of AIS at 38 weeks of pregnancy, successfully treated with alteplase [4]. Ritchie et al., 2015 used IVT at 39 weeks of pregnancy and had successful outcome [5]. Aaron S et al., 2020 from Vellore, India treated a case of AIS at term pregnancy with alteplase administered 110 mins from the onset of stroke. The patient underwent normal vaginal delivery three days after thrombolysis and postpartum was uneventful [6]. The Canadian stroke best practice consensus statement published in 2018 favored thrombolytic therapy in AIS during pregnancy [7]. However, often in practice, physicians refrain from recommending thrombolytic therapy during pregnancy due to fear of causing harm to the mother and the fetus.

The molecular weight of alteplase and tenecteplase are 59,042 and 58,951 Da, respectively. Since both have large molecular weight, they do not cross the placenta [8]. We preferred tenecteplase in our case, given the easy and fast intravenous bolus administration and its proven efficacy even in large vessel occlusion. [9].

4. Conclusion

To the best of our knowledge, this is the only case of AIS in pregnancy successfully treated with tenecteplase. Current American Heart Association/American Stroke Association guidelines do not consider pregnancy to be a contraindication to thrombolysis if the deficits are disabling and the bleeding risks are acceptable. Hence, thrombolytic

therapy should not be withheld in pregnancy and such a treatment can be administered even in small stroke centers.

CRediT authorship contribution statement

Balamurugan Namasivayam: Writing – review & editing, Writing – original draft, Conceptualization. **Chitra Sengodan:** Writing – review & editing, Conceptualization. **Lavanya Mohanasundaram:** Writing – review & editing. **Sathya Chinna Gounder:** Investigation. **Madunisha Sivakumar:** Data curation, Conceptualization.

Declaration of competing interest

None.

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