

Stroke in twin pregnancy: a rare case of acute ischemic stroke management

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CASE PRESENTATION

A 35-year-old patient at 33 weeks of a dichorionic diamniotic twin pregnancy presented with a complex medical history, including a previous cesarean section, hypothyroidism, gestational hypertension treated with methyldopa from the 28th week of gestation, and a mild COVID-19 infection at 25 weeks of gestation. She developed sudden onset aphasia, right-sided hemianopia, and coordination disorders on the right side. She was urgently transported to the emergency room at the University Hospital in Cracow with a negative COVID-19 antigen test, and she was suspected of having an ischemic stroke. An MRI without contrast revealed diffusion restriction in the left medial temporal and occipital lobes, thalamus, and pulvinar nucleus, indicating an acute ischemic stroke in the territory of the left posterior cerebral artery (Fig. 1). Angio-MRI showed an asymmetrically reduced flow signal in the left posterior cerebral artery. The patient was conscious but exhibited sensory-motor aphasia, right-sided hemianopia, a less pronounced right nasolabial fold, and bilateral positive Babinski reflexes, with an NIHSS (National Institutes of Health Stroke Scale) score of 7, suggesting a moderate stroke. Treatment with intravenous alteplase — a 6.5 mL bolus (0.01 g, 0.02 g, and 0.05 g) was initiated, followed by a 69 mL hourly infusion. Since no large vessel occlusion was present, she was not eligible for endovascular treatment. Fetal well-being was monitored three hours after the alteplase infusion, showing normal ultrasound and Doppler velocimetry results. The obstetric examination revealed no pathologies. Rehabilitation began the following day, and her headache responded to intravenous paracetamol. The gynecological reconsultation was unremarkable. Neurological reassessment showed improvement, with a decrease in NIHSS score to 2. Ultrasound Doppler of the lower limbs revealed only varicose vein dilatation, more pronounced on the left side. A follow-up brain MRI identified a small hemorrhagic focus within the ischemic lesion (Fig. 2), and echocardiography revealed left atrial enlargement. Angio-MRI showed a slight narrowing of the left posterior cerebral artery. Neck ultrasound showed no abnormalities. Aspirin therapy was recommended in doses of 150 mg after returning home and later adjusted to 75 mg. The patient also underwent a hematological consultation due to a low fibrinogen concentration resulting from the fibrinolytic treatment. Tests for congenital thrombophilia and antiphospholipid syndrome were ordered, and the results obtained were normal. The patient was transferred to the Pregnancy Pathology Department. Routine cardiotocography monitoring showed normal results. She received steroid therapy for fetal lung maturation, iron supplementation for anemia, and the gradual administration of enoxaparin. The patient was discharged one week after the stroke event and readmitted at 37 weeks of gestation for a scheduled cesarean section due to the AIS episode and previous cesarean history caused by arrested progress of labor — as recommended by the Polish Society of Gynecologists and Obstetricians. The surgery, performed under spinal anesthesia, resulted in the delivery of healthy newborns. Postoperative recovery was stable. Neurological follow-up revealed persistent right-sided hemianopia and a positive Babinski reflex on the left, necessitating ongoing observation and further investigations.

DISCUSSION

This case highlights the complexity of AIS management in pregnancy, especially with multiple gestations and pre-existing conditions [1]. The patient's hypothyroidism, gestational hypertension, and recent COVID-19 infection

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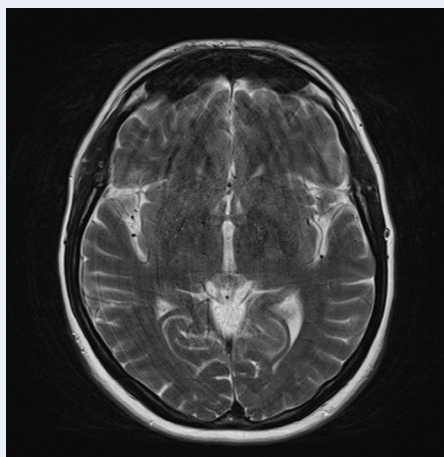


Figure 1. MRI showing stroke of left hemisphere in a day of admission

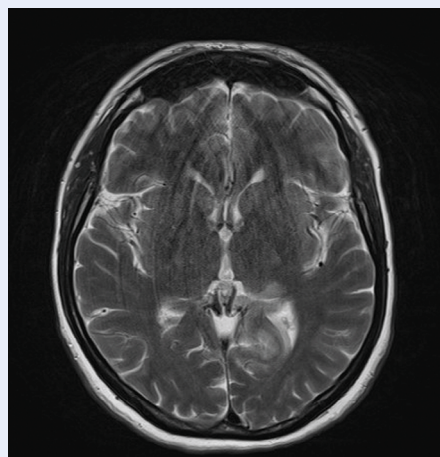


Figure 2. MRI showing resolving the lesion after alteplase treatment

significantly contributed to her elevated stroke risk, as observed in other studies [2, 4]. The hypercoagulability associated with COVID-19 during pregnancy amplifies stroke risks, particularly in the third trimester and among those with diabetes, hypothyroidism, and hypertension [4]. The risk persists for several weeks post-infection, with the initial week post-COVID-19 seeing a significantly heightened risk (HR of 23) compared to later weeks (HR of 1.62 at week 49) [5]. Even before COVID-19, viral infections like influenza, VZV, HCV, or HSV have been linked to increased short-term stroke risk [6, 7]. However, COVID-19 increases the risk of thrombotic events threefold compared to influenza [8].

In this case MRI facilitated the timely diagnosis, and the treatment with intravenous alteplase aligned with current guidelines [3]. IVT is recognized as both effective and safe treatment option for AIS in pregnancy [9, 10]. Experts recommend applying the same stroke qualification criteria to pregnant and postpartum women as to other patients, albeit with a tailored assessment of the risk-benefit ratio. The treatment choice hinges on the time elapsed from symptom onset to diagnosis and the presence of a large vessel occlusion; thrombectomy is preferable if the latter is present and hemorrhagic risk postpartum is considered [3]. The complication rates for thrombolysis in pregnant women are similar to those in non-pregnant populations. Out of 20 published cases of childbearing women receiving IVT for AIS (alone or in combination with EVT), two cases of intracranial hemorrhage (with favorable outcomes) and one intrauterine hematoma were reported [1].

In this case, a multidisciplinary approach involving neurology, obstetrics, and radiology was crucial for ensuring maternal and fetal safety. The decision to proceed with cesarean delivery at 37 weeks was based on individualized care considerations, following the recommendations of the Polish Society of Gynecologists and Obstetricians. The patient's recovery, marked by an improvement in the NIHSS score and successful delivery, underscores the effectiveness of timely and coordinated care. However, the persistence of neurological deficits highlights the need for continuous monitoring and rehabilitation.

CONCLUSIONS

This case underscores the need for prompt recognition of stroke symptoms, the utility of neuroimaging in diagnosis, and the effectiveness of a multidisciplinary approach to treatment in pregnancy. The interaction of COVID-19 with pregnancy-related changes exacerbates the likelihood of thrombotic complications, underscoring the need for heightened vigilance and proactive management in these patients. Moreover, the successful use of intravenous thrombolysis in this case illustrates this treatment's potential safety and efficacy in pregnant patients, providing a valuable reference for managing similar cases. Future research and updated clinical guidelines are vital for optimizing management strategies for AIS in pregnant patients, ensuring the best possible outcomes for both mother and child.

Article information and declarations

Ethics statement

The patient's informed consent was obtained.

Author contributions

AP— 40% — concept, assumptions, corresponding author, analysis and interpretation of data, article draft; MK — 20% — acquisition of data, revised article critically; AJ — 30% — acquisition of data, revised article critically, analysis and interpretation of data; HH — 10% — acquisition of data.

Conflict of interest

All authors declare no conflict of interest.

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