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DOI: [10.1159/000342307](https://doi.org/10.1159/000342307)**Thrombolysis in an Ischemic Stroke Patient on Dabigatran Anticoagulation: A Case Report**

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Stroke is a leading cause of mortality and disability in many countries. Cardioembolism is one of the major causes of stroke in this population. In the south of Brazil, nearly 30% of ischemic strokes are due to cardioembolism [1].

Recombinant tissue-type plasminogen activator (rt-PA) has shown good results in the treatment of stroke and new anticoagulants in stroke prevention. The use of rt-PA in acute ischemic strokes is a widespread clinical practice. Anticoagulation therapies have been used for many years in cardioembolic stroke patients. Nowadays, new medications are being used to better control nonvalvular atrial fibrillation [2, 3].

There is a well-established protocol for patients taking traditional anticoagulants as thrombolytic agents [2]. In patients using warfarin, thrombolysis is only indicated when the international normalized ratio is less than 1.7. However, there is no standard protocol for the use of thrombolytic therapies in patients who are using the new anticoagulants.

Case Report

We report a case of a 73-year-old man with a history of non-valvular atrial fibrillation, hypertension, smoking and a prior transient ischemic attack 7 months previously, who had been using 110 mg of dabigatran twice daily since the transient ischemic attack. The patient had excellent adherence to the treatment and there was no precipitating factor for stroke, such as dehydration or nonuse of medication. His CHADS2VASC was 6. He arrived in the emergency room with abrupt onset of left hemiplegia and dysarthria 2 h before the initial evaluation (NIHSS: 14; the onset of neurological deficit occurred 7 h after the last dose of dabigatran). At the time of admission, his temperature was normal and his blood pressure was 160/85 mm Hg, his international normalized ratio was 1.13, activated partial thromboplastin time 38 s (normal 23–32 s), thrombocyte count $170 \times 10^3 \text{ mm}^3$ (normal 140×10^3 to $400 \times 10^3 \text{ mm}^3$) and his creatinine was 0.8; there were no relatives present, and the neurologist was unaware of the patient's use of dabigatran. A conventional noncontrast computed tomography of the brain showed no abnormality and the patient was submitted to an intravenous infusion of rt-PA 0.9 mg/kg (total dose: 72 mg). During the infusion of rt-PA, the patient showed an improvement in his neurological deficit (NIHSS: 7 upon completing the infusion), and his blood pressure and heart rate were adequately controlled. A brain MRI was performed that showed an increase in the T₂-weighted/fluid-attenuated inversion recovery and diffusion-weighted imaging signals in the vascular territory of the right middle cerebral artery 2 days after the onset of symptoms and finding no hemorrhage (fig. 1). A Doppler sonogram of

Fig. 1. Brain diffusion-weighted magnetic resonance image showing an increased signal in the vascular territory of the right middle cerebral artery.

neck vessels and transesophageal echocardiography were normal (without embolic sources). After 1 week, the patient was asymptomatic, discharged from the hospital and prescribed 110 mg of dabigatran, twice daily.

Discussion

Since the publication of the NINDS in 1995, the protocols for rt-PA use have contained well-established inclusion and exclusion criteria, some of which are based on laboratory tests that reveal the level of coagulation [2].

Dabigatran is a new, FDA-approved, oral anticoagulant. In the Randomized Evaluation of Long-Term Anticoagulant Therapy Trial (RE-LY), dabigatran was shown to be as effective as warfarin at preventing systemic embolism and future stroke, while providing a lower risk of major hemorrhage [3].

The activated partial thromboplastin time and ecarin clotting time, which have been reported as being correlated with dabigatran concentrations, can help clinicians determine the coagulation level in this situation [4]. The ecarin clotting time was not measured in the case described above.

In the literature there are few papers that describe cases where the patient required the use of thrombolytic agents while under treatment with new classes of anticoagulants [5–7]. Among those cases, we found only 1 that evolved with intracranial bleeding, in which the platelet count was low and the patient had received dabigatran 3 h before the rt-PA [8].

In an experimental study in rats, Pfeilschifter et al. [9] demonstrated that the use of rt-PA after occlusion of the middle cerebral artery for 3 h did not increase the risk of intracranial hemorrhage in mice receiving doses of dabigatran that determined blood levels equivalent to a dosage of 150 mg twice daily in humans.

We think that, with the increase in the use of the new anticoagulants, this clinical picture will be more common and that it is important to develop a protocol to define how neurologists should act in these cases.

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