Cerebrovasc Dis 2013;35:89–90
DOI: 10.1159/000346078

What if a Patient with Atrial Fibrillation and Anticoagulant Treatment Is Suffering from Acute Ischemia Stroke?

Chungkui Zhou^a, Lijun Zhu^b, Jiang Wu^a, Shaokuan Fang^a

^aDepartment of Neurology, First Hospital of Jilin University, and

^bDepartment of Neurology, Third Hospital of Jilin University, Changchun, China

Atrial fibrillation (AF) is responsible for about 25% of all ischemic strokes [1], and the risk of stroke attributed to AF increases with age [2]. AF was associated with increased stroke severity, high frequency of complications and poor outcome [3–5]. Thrombolytic therapy with intravenous tissue plasminogen activator (tPA) is of net benefit in patients with acute ischemic stroke [6].

Approximately 50–60% of ischemic strokes in patients with AF are definitely or probably cardioembolic in origin [7, 8]. In patients with cardioembolic stroke, cerebral arteries are mostly occluded by red thrombi [9]. Red thrombi, which contain erythrocytes and some fibrin, were found to be more vulnerable to tPA with a resultant higher chance of recanalization in an animal study [10]. This finding is reflected in clinical observations that successful tPA-induced recanalization often occurred in cardioembolic strokes [11, 12]. Because ischemic stroke in patients with AF mostly depends on embolism, a primary preventive approach treatment with oral anticoagulants is mandatory [13–16]. What if a patient with AF and anticoagulant treatment is suffering from acute ischemia stroke?

Marrone and Marrone [17] reported a case of a 73-year-old man with a history of AF who was submitted to intravenous thrombolysis while under treatment with new classes of anticoagulants. In the guidelines of almost all countries, AF in isolation is not regarded as a contraindication for thrombolytic therapy. However, a patient who could be treated with tPA must, according to the guideline, not take an oral anticoagulant or if an anticoagulant has been taken, the INR must be ≤ 1.7 or if the patient has received heparin in the previous 48 h, the APTT must be in the normal range. This patient's INR and APTT did not meet this criterion. I believe that the neurologist was unaware of the patient's use of dabigatran. Fortunately, the patient did not develop cerebral hemorrhage. In my opinion, we should prefer intra-arterial thrombolysis to lessen the effect on the coagulation time.

C.Z. and L.Z. contributed equally to this work.

Disclosure Statement

There is no conflict of interest.

References

- Marini C, De Santis F, Sacco S, Russo T, Olivieri L, Totaro R, Carolei A: Contribution of atrial fibrillation to incidence and outcome of ischemic stroke: results from a population-based study. *Stroke* 2005;36:1115–1119.
- Stroke Risk in Atrial Fibrillation Working Group: Independent predictors of stroke in patients with atrial fibrillation: a systematic review. *Neurology* 2007;69:546–554.
- Lin HJ, Wolf PA, Kelly-Hayes M, Beiser AS, Kase CS, Benjamin EJ, D'Agostino RB: Stroke severity in atrial fibrillation. The Framingham Study. *Stroke* 1996;27:1760–1764.
- Kimura K, Minematsu K, Yamaguchi T: Japan Multicenter Stroke Investigators' Collaboration (J-MUSIC). Atrial fibrillation as a predictive factor for severe stroke and early death in 15,831 patients with acute ischaemic stroke. *J Neurol Neurosurg Psychiatry* 2005;76:6796–6783.
- Lin S, Wu B, Hao ZL, Kong FY, Tao WD, Wang DR, He S, Liu M: Characteristics, treatment and outcome of ischemic stroke with atrial fibrillation in a Chinese hospital-based stroke study. *Cerebrovasc Dis* 2011;31:419–426.
- The National Institute of Neurological Disorders Stroke rt-PA Stroke Study Group: Tissue plasminogen activator for acute ischemic stroke. *N Engl J Med* 1995;333:1581–1587.
- Hart RG, Pearce LA, Miller VT, Anderson DC, Rothrock JF, Albers GW, Nasco E: Cardioembolic vs noncardioembolic strokes in atrial fibrillation: frequency and effect of antithrombotic agents in the stroke prevention in atrial fibrillation studies. *Cerebrovasc Dis* 2000;10:39–43.
- Benbir G, Uluduz D, Ince B, Bozulolcay M: Atherothrombotic ischemic stroke in patients with atrial fibrillation. *Clin Neurol Neurosurg* 2007;109:485–490.
- Ogata J, Yutani C, Otsubo R, Yamanishi H, Naritomi H, Yamaguchi T, Minematsu K: Heart and vessel pathology underlying brain infarction in 142 stroke patients. *Ann Neurol* 2008;63:770–781.
- Jang IK, Gold HK, Ziskind AA, Fallon JT, Holt RE, Leinbach RC, May JW, Collen D: Differential sensitivity of erythrocyte-rich and platelet-rich arterial thrombi to lysis with recombinant tissue type plasminogen activator. A possible explanation for resistance to coronary thrombolysis. *Circulation* 1989;79:920–928.
- Molina CA, Montaner J, Arenillas JF, Ribo M, Rubiera M, Alvarez-Sabin J: Differential pattern of tissue plasminogen activator-induced proximal middle cerebral artery recanalization among stroke subtypes. *Stroke* 2004;35:486–490.
- Puig J, Pedraza S, Demchuk A, Daunis-i-Estadella J, Termes H, Blasco G, Soria G, Boada I, Remollo S, Baños J, Serena J, Castellanos M: Quantification of thrombus hounsfield units on noncontrast CT predicts stroke subtype and early recanalization after intravenous recombinant tissue plasminogen activator. *AJNR Am J Neuroradiol* 2012;33:90–96.

Shaokuan Fang
Department of Neurology
The First Teaching Hospital of Jilin University
Changchun (China)
E-Mail fang20063536@hotmail.com

- 13 Tsang TSM, Petty GW, Barnes ME, O'Fallon WM, Bailey KR, Wiebers DO, Sicks J-RD, Christianson TJH, Seward JB, Gersh BJ: The prevalence of atrial fibrillation in incident stroke cases and matched population controls in Rochester, Minnesota: changes over three decades. *J Am Coll Cardiol* 2003;42:93–100.
- 14 Wolf PA, Abbott RD, Kannel WB: Atrial fibrillation as an independent risk factor for stroke: the Framingham Study. *Stroke* 1991;22:983–988.
- 15 Hart RG, Halperin JL: Atrial fibrillation and stroke: concepts and controversies. *Stroke* 2001;32:803–808.
- 16 Fuster V, Ryden LE, Asinger RW, Cannom DS, Crijns HJ, Frye RL, Halperin JL, Kay GN, Klein WW, Levy S, McNamara RL, Prystowsky EN, Wann LS, Wyse DG: ACC/AHA/ESC guidelines for the management of patients with atrial fibrillation: executive summary: a report of the Am College of Cardiology/Am Heart Association Task Force on Practice Guidelines and the European Society of Cardiology Committee for Practice Guidelines and Policy Conferences (Committee to Develop Guidelines for the Management of Patients with Atrial Fibrillation). *Circulation* 2001;104:2118–2150.
- 17 Marrone LC, Marrone AC: Thrombolysis in an ischemic stroke patient on Dabigatran anticoagulation: a case report. *Cerebrovasc Dis* 2012;34:246–247.