Letter to the Editor

Hemorrhagic Transformation After Acute Ischemic Stroke in Atrial Fibrillation Patients

Dear Editor

We are truly grateful to yours and the reviewers' critical comments and thoughtful suggestions. After carefully considering and discussing the suggestions mentioned in the letter, we summarize the following points and hope to communicate with the reviewers to make progressive together.

First, patients should be evaluated for CHA2DS2-VASc, HAS-BLED scores before taking anticoagulant. We agree with this very much. For anticoagulation, we think there may be some relationship between it and hemorrhagic transformation (HT). However, the reasons for not including this factor in this experiment are as follows. First, according to some researches,[1,2] the new anticoagulant drugs are not inferior or even better than warfarin in preventing cardiogenic stroke. And the incidence of intracranial hemorrhage is significantly reduced. According to the guideline,[3] the best anticoagulant strength of warfarin is INR 2.0-3.0. At this time, the risk of hemorrhage and thromboembolism is the lowest. In our study of patients with atrial fibrillation, the 95% confidence interval of INR was 1.00-1.84 through the data analysis. The INR is less than 2, which means that the much lower probability of HT after thrombolysis. For patients with AF admitted to hospital, the anticoagulant therapy was based on the computed tomography or magnetic resonance imaging, and the end point of our study is the occurrence of HT. We thought that in this case, the application of anticoagulants had taken into account the effects of HT. Second, the focus of this paper was to study the relationship between HT, baseline NIHSS, and NIHSS after 2 hours of thrombolytic therapy. Third, at the beginning of the study, the relationship between anticoagulation and HT was indeed neglected. Although there are many literatures[4] discussing the relationship between anticoagulation and HT, the follow-up still deserves further study.

Second, cerebral microbleeds (CMBs) are indeed an interesting point about the risk factors for HT. It is still controversy over whether CMBs are related to HT. Nighoghossian et al's research[5] and Nagaraja et al's research[6] showed that CMB is an independent risk factor for HT. However, Fiehler et al's study[7] and Zhang et al's research[8] holding the opposite view. Another study of 570 people in the European multicenter[9] showed that there were 86 patients with CMB after thrombolysis and 5.8% of symptomatic intracranial hemorrhage, of which 2.7% had CMB, but the results are not significantly different. Therefore, the effect of CMB on HT still needs further discussion. CMBs are mainly observed according to the susceptibility-weighted imaging (SWI) on magnetic resonance imaging. However, our study was retrospective in which patients were not routinely enrolled in susceptibility-weighted imaging. It is therefore difficult to objectively assess and quantify the amount of CMBs. Therefore, the factor was not included. In our subsequent prospective study, we will further discuss the CMBs.

We sincerely thank the reviewers for their positive comments and valuable suggestions for our research. In our future research on cerebrovascular diseases, if necessary, we will carefully consider factors such as anticoagulant and CMBs.

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