Letter to the Editor

Stroke *welcomes Letters to the Editor and will publish them, if suitable, as space permits. Letters must reference a* Stroke *published-ahead-of-print article or an article printed within the past 4 weeks. The maximum length is 750 words including no more than 5 references and 3 authors. Please submit letters typed double-spaced. Letters may be shortened or edited.*

Response by Voelkel and Hubert to Letter Regarding Article, "Thrombolysis in Postoperative Stroke"

In Response:

Thank you for your comments and helpful additions to our article Thrombolysis in Postoperative Stroke. First, you ask for notifying the exact time or onset of bleeding complications after intravenous thrombolysis (IVT) in postoperative stroke. The bleeding complications occurred immediately during or after IVT (ie, colon bleeding, hematoma expansion gluteal) or, regarding the intracranial hemorrhage (ICH), at least within 24 hours (ICH seen on the control computed tomographic scan on the following day). You comment that "asymptomatic ICH was not well defined" and that it "is not clear how asymptomtic ICH is evaluated." As mentioned in our methods section, we used the definition following Safe Implementation of Thrombolysis-in-Stroke-Monitoring-Study criteria.[1] ICH was defined as any local or remote ICH documented in the follow-up computed tomographic scan after thrombolysis. It would have been described as symptomatic if it had lead to a neurological deterioration of ≥4 points on National Institutes of Health Stroke Scale. If National Institutes of Health Stroke Scale was not sufficiently documented, deterioration was estimated by evaluating the description of neurological deterioration in the patient's discharge letter. None of our patients with ICH had a significant deterioration of its neurological status, thus all ICH in our cohort were graduated as asymptomatic.

Second, you comment on the evaluation of surgical site hemorrhage (SSH) in our data. Detailed information for the bleeding complications is given in our article in Table 4. None of these patients had bleeding complications immediately after surgery but only after administering IVT, suggesting that SSH was not caused by surgery alone. However of course, we can only assume that SSH occurred as consequence of systemic thrombolysis.

Third, you mention other important risk factors as blood pressure, cerebral microbleedings, and renal impairment should also have been evaluated. Of course, these factors have to be assessed in each patient individually when IVT is a possible treatment option. We agree that there may be a higher risk of hemorrhagic transformation in patients with ischemic stroke and high blood pressure levels, as well as there is a significant higher risk of post-thrombolysis ICH in patients with several cerebral microbleedings. Although renal impairment alone is not a contraindication for IVT, severe renal impairment is associated with higher risk of symptomatic ICH as mentioned above and has to be taken into account when balancing the risk–benefit ratio of IVT.[2] Because this is a retrospective study, we could not reliably gather these data for all patients, especially not those of cerebral microbleedings. However, our primary outcome was SSH and not ICH. Whether the mentioned risk factors influence SSH likewise is not known and should further be studied. Also, whether a postoperative condition generally increases risk of IVT in acute stroke cannot be answered with our study because sample size is too small and it lacks a control group.

We thank Liu, W. Chen, and J. Chen for their comments and hope that our study may be helpful in the dilemma of treating postoperative patients with stroke.

Disclosures

None.

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