Asymptomatic Hemorrhage After Thrombolysis May Not Be Benign: Prognosis by Hemorrhage Type of the Canadian Alteplase for Stroke Effectiveness Study Registry

To the Editor:

In their interesting article, Dzialowski et al report that asymptomatic hemorrhage after thrombolysis may not be benign and was associated with a worse outcome. Specifically, they found that hemorrhagic infarction–2 (HI-2) was associated with a worse long-term outcome. We wish to bring to the authors’ attention our article on asymptomatic hemorrhagic transformation of cerebral infarction, which examined a similar question, in which we found that asymptomatic hemorrhage did not worsen outcome. There are several possible reasons that may explain the discrepancy in these results. Their title does not reflect the patient population they studied. It appears that they included all hemorrhages in their study population, as opposed to asymptomatic hemorrhage as was suggested in their title. Dzialowski et al used a radiological definition of hemorrhage that was used in the European Cooperative Acute Stroke Study. Using that definition, HI-2 was associated with a greater chance of poor outcome. Although the classification HI-2 reflects relatively minor hemorrhage, it remains a radiological criterion. In our study, we used the clinical definition of asymptomatic hemorrhage that was used in the NINDS tPA stroke trial, and this definition was only applied if the patient did not deteriorate clinically in the setting of hemorrhage. It is possible, therefore, that some of the patients in Dzialowski et al’s study with HI-2 might actually have had neurological deterioration at the time of their hemorrhage; therefore, the hemorrhage would not have been “asymptomatic.” In addition, a very important variable that was not included in their analysis was lesion volume. In our study, when lesion volume was not controlled for, asymptomatic hemorrhage did in fact appear to worsen long-term outcome. When 24-hour lesion volume on CT was controlled for, however, asymptomatic hemorrhagic transformation no longer was associated with worse outcome, suggesting that lesion volume was a confounder, and must be taken into account. This issue is important, particularly as many of our colleagues in neurology and emergency medicine remain uncomfortable with the use of tPA for acute stroke because of the associated risk of hemorrhage. Our data showed that asymptomatic hemorrhagic transformation does not worsen long-term outcome. We would ask the authors to consider that the worse long-term outcome in their HI-2 patients might have been attributable to some of their HI-2 patients actually having been symptomatic, as well as to their failure to control for lesion volume.

Disclosures

None.

Richard Libman, MD
Department of Neurology
Long Island Jewish Medical Center
New Hyde Park, NY

Thomas Kwiatkowski, MD
Department of Emergency Medicine
Long Island Jewish Medical Center
New Hyde Park, NY


Asymptomatic Hemorrhage After Thrombolysis May Not Be Benign: Prognosis by Hemorrhage Type of the Canadian Alteplase for Stroke Effectiveness Study Registry
Richard Libman and Thomas Kwiatkowski

*Stroke*. 2007;38:e88; originally published online August 2, 2007; doi: 10.1161/STROKEAHA.107.486456

*Stroke* is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2007 American Heart Association, Inc. All rights reserved.
Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/38/9/e88

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in *Stroke* can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to *Stroke* is online at:
http://stroke.ahajournals.org//subscriptions/