Cerebral Blood Flow Thresholds in Acute Stroke Triage

To the Editor:

We read with interest the recent article by Bandera and colleagues reporting their systematic review of cerebral blood flow (CBF) thresholds for ischemic penumbra and infarct core in acute ischemic stroke.1 Although we agree with the conclusion that further work is indeed required, before the use of CBF thresholds can become clinically routine, there are a number of important points not covered in this article that deserve further discussion.

First and most important, this review is already dated in that there is no mention of CT perfusion thresholds. With CT perfusion, unlike MR perfusion, the linear relationship between contrast concentration and pixel intensity more readily lends itself to quantification of blood flow values. Two recent publications, in particular, shed additional light on the use of CT-CBF thresholds in predicting tissue outcome.2,3 These articles, as well as another on MR perfusion not analyzed by Bandera et al,4 underscore the potential influence of both (1) time-to-scan and (2) time-to-reperfusion/recanalization on blood flow thresholds for core and penumbra. Perhaps of greatest relevance, however, in explaining the variability of the thresholds reviewed by Bandera et al, is (3) the blood flow difference between normal gray and white matter.5 Because the baseline CBF of gray matter (measured in ml/100 g/min) is roughly twice that of white matter, absolute perfusion thresholds for ischemia will vary widely depending on the gray-to-white matter ratio within a given region of interest.3

Finally, it is MR diffusion-weighted imaging and CT cerebral blood volume mapping—and not CBF thresholds—that have been increasingly advocated for defining infarct core.6,7 The mismatch between core, and even a relatively imprecise operational measure of penumbra, such as visual interpretation of transit time images, has already proven a powerful tool for measuring ischemic penumbra in acute stroke patients treated with intra-arterial therapy. AJNR Am J Neuroradiol. 2006; 27:20–25.

We read with interest the recent article by Bandera and colleagues reporting their systematic review of cerebral blood flow (CBF) thresholds for ischemic penumbra and infarct core in acute ischemic stroke: a systemic review. Stroke. 2006;37:1334–1339.


Disclosures

M.L. is on the speakers bureau of GE Medical Services and Bracco Diagnostics, and receives educational support from GE Medical Services. He is also on the medical advisory board for Bracco Diagnostics and CoAxia Inc. W.P.D. is involved in GE research agreements and a CoAxia Inc Core Laboratory Sentsi Trial. He is also a member on the scientific advisory board for Sanofi-Aventis Core Laboratory.
Cerebral Blood Flow Thresholds in Acute Stroke Triage

Stroke. 2006;37:2202; originally published online August 3, 2006;
doi: 10.1161/01.STR.0000237203.48179.44

Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2006 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/37/9/2202

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/