Diagnostic Test for Acute Cerebral Ischemia

To the Editor:

We read with interest the article recently published by Lynch JR et al. The authors report that the knowledge of 1 marker of glial activation (S100ß), 2 markers of inflammation (matrix metalloproteinase [MMP]-9 and vascular adhesion molecule [VCAM]) and 1 marker of thrombosis (von Willebrand factor [vWF]) in the first 6 hours can help identify patients with acute cerebral ischemia who could benefit from thrombolytic treatment. Thrombolysis is an effective therapy for ischemic stroke whether administered intravenously within 3 hours or intraarterially within 3 to 6 hours. Many stroke patients arrive in emergency rooms too late to receive thrombolysis. It is possible to shorten admission delay by using systems for fast identification and transport of acute ischemic stroke patients. The development of a panel of blood-borne biochemical markers may be beneficial for the quick diagnosis of ischemic stroke, as used today in cases of myocardial infarction. These biomarkers should in only minutes differentiate patients with TIA or other conditions causing acute focal neurological deficits from patients with ischemic stroke candidates to thrombolytic therapy. However, an increased expression of VCAM, MMP-9, and vWF is expected in ischemic stroke candidates to thrombolytic therapy. Therefore, biochemical markers analyzed in the study of Lynch et al.1 are upregulated in ischemic stroke but interindividual variability is large.

Criticism about the extensive use of thrombolysis is based on the lack of diagnostic procedures demonstrating the presence of an arterial occlusion and potentially salvageable ischemic tissue. Neuroimaging techniques can provide information about the presence of penumbra tissue and vessel occlusion in hyperacute phase of stroke, but biochemical markers cannot. It therefore appears that biochemical markers are time-consuming and are not helpful for the rational selection of patients as candidates for thrombolysis for several reasons. First, given the variability of serum levels of the different biochemical markers among patients, this method cannot absolutely confirm or reject ischemic stroke diagnosis. Also, given the lack of information obtained with these markers about the presence of penumbra tissue or vascular occlusion, their utility in the emergent evaluation of ischemic stroke is very limited. Obviously, as Lynch et al.1 point out, further studies will be necessary to validate the use of these markers in clinical practice. Since time is critical in acute stroke management, patients with suspicion of ischemic stroke should be urgently taken to a hospital with expert stroke care.

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Stroke. published online April 15, 2004;
Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0039-2499. Online ISSN: 1524-4628

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World Wide Web at:
http://stroke.ahajournals.org/content/early/2004/04/15/01.STR.0000127040.95336.0b.citation

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