Letters to the Editor

Stroke Therapy in Patients Considering Prothrombin Time and International Normalized Ratio

To the Editor:

We recently encountered a dilemma caring for a patient with an ischemic stroke. He was 88 years old with chronic atrial fibrillation and treated with warfarin. His symptoms included aphasia, hemianopia, and hemiplegia; his National Institutes of Health Stroke Scale score was 23 and he presented within 3 hours of onset. Laboratory values were normal except for an international normalized ratio (INR) of 1.7 and prothrombin time (PT) of 20 seconds.

Intravenous tissue plasminogen activator is the only proven therapy after acute stroke. The National Institute of Neurological Disorders and Stroke (NINDS) study,1 published in 1995, excluded patients “taking anticoagulants … as were those with PT >15 seconds.” Current American Heart Association guidelines recommend against the use of tissue plasminogen activator in patients taking an oral anticoagulant when the INR is >1.7,2 whereas the Activase package insert similarly warns against tissue plasminogen activator use if the INR is >1.7 or PT is >15 seconds.

According to these guidelines and the package insert, our patient’s INR would have made him eligible for tissue plasminogen activator therapy, whereas the PT did not.

This case illustrates a few questions: (1) Do the NINDS exclusion criteria represent absolute contraindications? Many were based on limited preclinical information and were arbitrarily chosen. This does not mean patients outside of these criteria will not benefit; only that they were not tested. As such, many physicians treat patients outside of the NINDS guidelines, although compelling evidence shows the risk of hemorrhage is proportional to the extent of the NINDS protocol violations.3,4 (2) Is it necessary to consider both INR and PT? Because PT is known to vary between laboratories, INR was created to allow for interpretation of PT results independent of the reagent used. It is a ratio of PT to a controlled PT raised to the power of the International Sensitivity Index (ISI) value for the analytic system used.

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\text{INR} = \left( \frac{\text{PT}_{\text{test}}}{\text{PT}_{\text{normal}}} \right)^{\text{ISI}}
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Therefore, identical PT values may result in different INR values. Given the inherent unreliability of PT and the presence of a standardized measure using PT in its calculation, should PT be used at all in patients with stroke?

Due to the dichotomy of laboratory values in our patient, we did not use intravenous tissue plasminogen activator. Instead, we offered endovascular techniques, but the patient did not improve and died during his hospitalization. Treatment of acute stroke requires rapid high-risk–high-reward decisions often made with incomplete information. Even seemingly concrete findings like laboratory values are not always black and white.

Disclosures

None.

Karen Albright, MD
Andrew Stemer, MD
Gilda Tafreshi, MD
Thomas Hemmen, MD
University of California, San Diego Neurology Department San Diego, Calif

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Karen Albright, Andrew Stemer, Gilda Tafreshi and Thomas Hemmen

Stroke. 2010;41:e450; originally published online May 6, 2010;
doi: 10.1161/STROKEAHA.110.579771
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

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/41/6/e450

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