Therapeutic Implications for Routine Transthoracic Echocardiography in Acute Ischemic Stroke Patients

To the Editor:

We read with great interest the article by de Abreu et al1 on the topic of identifying the stroke mechanism in patients with sinus rhythm. These investigators raise 2 important issues: (1) the need to identify the mechanisms of stroke, and (2) therapy of patients with abnormal cardiac echo findings. The rationale for this study appears to be a lack of emphasis in the current guidelines that echocardiography is “an essential test.”2,3 They have identified a significant proportion of hospitalized stroke patients with some echocardiographic abnormalities. However, based only on a prevalence study of echocardiographic features, they draw rather strong conclusions regarding the need for routine echocardiography in acute ischemic stroke patients.

We agree that echocardiography can assist in clarifying the mechanism of ischemic stroke. However, we dispute the claim that echocardiography is an essential test in all ischemic stroke patients including those in sinus rhythm. The need for routine echocardiography ischemic stroke needs to be supported by strong evidence for a benefit from therapy, namely prophylactic anticoagulation. Of all the cardiac conditions listed in Table 2 of the article, only anterior wall dyskinesis or reduced ejection fraction from a recent anterior myocardial infarction can justify the use of warfarin, albeit for 3 months only.4 Although there is level I evidence that anticoagulation prevents stroke in patients with atrial fibrillation,5 there is no such support at present for routine anticoagulation for stroke prophylaxis in people with sinus rhythm even among high-risk patients with heart failure.6 This lack of level I evidence may have been the reason why the current guidelines have not emphasized the role of echocardiography.

In summary, although de Abreu et al have contributed to highlighting potential mechanisms of stroke, their inferences regarding therapy in patients with abnormal echocardiographic findings are not justified at present. This is an important issue because the routine ordering of tests can result in an astronomical rise in the cost of caring for stroke patients without perceived benefit.

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Response:

Phan and colleagues’ criticism of our article is based on their statement that “of all the cardiac conditions listed in Table 2 of the article, only anterior wall dyskinesis or reduced ejection fraction from a recent anterior myocardial infarction can justify the use of warfarin”. We cannot agree.

Mitral valve stenosis with an enlarged (>55 mm) left atria, valve prolapse, left ventricular systolic dysfunction (with an estimated ejection fraction <35%), dilated cardiomyopathy, previous myocardial infarction (with left ventricular wall dyskinesis), and left atria or left ventricle masses are all situations in which anticoagulation is considered beneficial.1,2 Most studies on the role of echocardiography on the management of acute stroke patients have focused on the capacity of transthoracic or transesophageal echocardiography to find potential sources of embolism.3,4,5 We have focused on finding abnormalities that would indicate a need of anticoagulation. There is an important difference between these 2 focuses. Potential sources of embolism that are looked for are usually left atrium/appendage spontaneous echo contrast or intracavitary trombi, interatrial septal anomalies, and intra-aortic atherosclerotic plaques or thrombi.3,4,5 Obviously, all studies show superiority of transesophageal echocardiography, when compared with transthoracic echocardiography, on the detection of these abnormalities. Nevertheless, what matters are the therapy implications of these findings, which usually mean deciding between antiplatelets and anticoagulants. These “potential sources of embolism” do not include frequent cardiac abnormalities that indicate the need of anticoagulation, like a dilated left ventricle, or an ejection fraction <35%. We believe this difference accounts for our high percentage of patients in whom the transthoracic echocardiogram changed therapy.

The controversy on this issue stems from the mixing of 2 different things: (1) conditions in which anticoagulation is suggested for stroke prophylaxis; (2) conditions in which anticoagulation is considered beneficial (whatever the reason).

In our study, we didn’t analyze other potential therapy implications of echocardiography findings, like the use of angiotensin-converting enzyme inhibitors in patients with class B heart failure (no symptoms, but with structural heart disease).6 But we believe that it is likely that ischemic stroke patients, having had a manifestation of atherosclerosis, will have other findings of atherosclerotic disease, namely in the heart, that can have therapy implications and can be detected by the echocardiogram.

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Response:

I want to thank Dr Hemphill and colleagues for their thoughtful letter about the BAC’s recent recommendations for Comprehensive Stroke Centers (CSC). Their support for the concept of CSCs is much appreciated. The importance of neurocritical care teams and neurointensivists is certainly appreciated by the BAC and is reflected in our recommendations. These specialists have a high level of training and expertise. In fact, the CSC recommendations state formal training as a neurointensivist is “preferred” for staffing the ICU. We further state that “Coverage by attending physicians or residents with expertise in cerebrovascular disease and critical care must be available 24/7. . . . such coverage may consist of a team approach. . . .” Recent literature does support improved outcomes when such expertise is available and used for critically ill neurology patients.

These positive data must be weighed against several other practical and logistical factors. The national survey done as part of the CSC paper (Appendix of that paper) rated a neurointensivist at 3.9 (out of 5), with 62% of respondents indicating that their institution had a neurointensivist. This indicates, as also noted by Hemphill and colleagues, that there is currently a limited supply and unequal distribution of neurointensivists. It also ignores the fact that some intensivists who are not neurointensivists provide excellent care to stroke patients, with the proper neurovascular support by a neurologist or neurosurgeon. Furthermore, there are many ICUs within academic medical centers that are not staffed just by neurointensivists but still provide excellent care to critically ill stroke patients.

As was pointed out in our paper, establishing a CSC might cost hospitals variable amounts of additional money depending on what resources and personnel were currently available. These costs could be offset by additional billings, improved outcomes, specific DRG coding, etc. It is also important to understand the patient mix and overall number of stroke patients seen at each facility to determine whether establishing a dedicated neurosciences ICU makes financial sense.

The CSC recommendations are meant to be flexible and modifiable as practice patterns change and the number of medical specialists increases. As noted in a recent publication, a CSC may be part of a system of stroke care, where consideration of local and regional resources and expertise are important factors in stroke care.1 When and if a formal certification process begins for CSCs, the suggestions noted by Hemphill and colleagues should be considered within the context of current care patterns and resources.

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