Detection of Right-to-Left Shunt With Transcranial Doppler Is Affected by Body-Positioning

To the Editor:

We read with great interest the recent study by Caputi et al regarding the postural dependency of right-to-left shunt (RLS) detection using contrast-enhanced transcranial Doppler (TCD).1 After using TCD to detect the bubble-load in 2 different body positions (recumbent and standing) in consecutive RLS-positive patients (confirmed by transthoracic echocardiogram), the authors concluded that the amount of bubbles detected was dependent on body position, with 42% of the study population exhibiting almost a 3-fold increase in the yield of microbubbles in the standing position compared to the supine position.1

Our group has previously investigated whether body-positioning may affect the sensitivity of TCD in detecting and grading RLS in patients with ischemic stroke or transient ischemic attacks that were referred to our neurosonology laboratory. As Caputi and colleagues acknowledge, we documented remarkably similar results to their findings.2 More specifically, in our study the change of body-positioning from the supine (which is the currently recommended position for TCD-screening for RLS according to the International Consensus Criteria developed in Venice3) to sitting upright position increased substantially the microbubble count (from a median of 20 in the supine to a median of 72 in the sitting position) in 42% of our study population. Moreover, we failed to document any changes in blood pressure and heart rate levels during TCD-testing in different body positions, whereas changes in body position followed by additional agitated saline injections were well-tolerated with no adverse events. In addition, if the initial supine Valsalva-aided contrast TCD-testing was negative, all subsequent positions/injections were also negative for RLS. In view of the limited available data as regards the effect of body-positioning on the yield of TCD in screening and grading RLS,1-5 Caputi et al may consider reporting if they recorded any posture-related changes in blood pressure and heart rate or any orthostatic symptoms during the application of their extended TCD protocol. Furthermore, it would be interesting if they were able to detect any cases with negative TCD-testing for RLS in the recumbent position, who were subsequently positive in the sitting position. These data may provide useful information concerning whether additional body positions also increase the sensitivity of TCD for detecting RLS in addition to increasing the number of detected microbubbles that affects substantially the grading of the degree of RLS.

Finally, we would like to underline that the findings of those 2 recent studies1,2 may have certain clinical applications (avoiding paradoxical embolism during surgery in the sitting position, diagnosing more reliably paradoxical embolism in patients with cryptogenic stroke, screening more effectively for the largely underdiagnosed platypnea orthodeoxia syndrome) as Caputi et al have insightfully noted in the discussion of their results. Additionally, we want to highlight the importance of correctly grading the degree of RLS using contrast TCD, because the studies of Serena et al6 and Anzola et al7 have shown that quantification of RLS on the basis of microbubble count can provide useful information for the likelihood of prevalent ischemic stroke or for the risk of recurrent ischemic stroke respectively. After taking into account the findings of the former 2 studies1,2 and recent reports8,9 that the Spencer-Logarithmic-Scale TCD criteria may be more sensitive and specific for diagnosing larger or functional patent foramen ovale, we propose that a prospective multicenter study of testing protocols with different body positions and a revision of commonly accepted procedural and diagnostic criteria to optimize RLS screening with TCD may be warranted.

Disclosures

None.

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