Valsalva maneuver in detection of right-to-left shunt by transcranial Doppler

Sir: We read with great interest the study by Lange et al (Arq Neuropsiquiatr 2010;68:410-3) regarding the effect of valsalva maneuver (VM) in right-to-left shunt (RLS) detection by transcranial Doppler (TCD). We wish to highlight some relevant issues.

Trans-esophageal echocardiography (TEE) is considered the gold-standard for diagnosing RLS. Although, TEE provides anatomical details of RLS, the real-time travel of a thrombus has been observed rarely[1]. Limitations of TEE include the need of an expert echocardiographer, poor tolerance by patients and often insufficient VM due to sedation and endoscope in the throat. In contrast, TCD is reliable, performed without sedation and carries high sensitivity and specificity as compared to TEE[2].

We disagree with the finding that the timing of VM does not influence the diagnosis of RLS. Considerable variations exist in the methodology for RLS detection, especially the timing of VM during the test performance. While VM has been performed simultaneously with the contrast injection in some studies[3], others initiated it after a delay of 3-5 seconds[2]. Substantial hemodynamic changes occur during the "Strain-phase" (amplifies inter-atrial left-to-right pressure-gradient and counteracts RLS) as well as the "release-phase" (reverses pressure gradient with sudden increase in venous return and right atrial pressure that facilitate RLS)[4]. Furthermore, VM causes considerable reduction, and even complete stoppage, of flow in proximal large veins. Thus, the injection of saline-air contrast mixture during VM into a proximal vein (with elevated pressure and near-stagnant flow) does not seem logical. Injection during VM theoretically seems counterproductive since the high venous-pressure might destroy some of the "microbubbles" in "saline-air" contrast mixture. This assumes further significance as the microbubbles created during the vigorous shaking of the contrast mixture survive only for a short time. We believe that although, the timing of VM may not affect the detection of RLS, it might influence the functional grading of the shunt.

Body position during the diagnosis of RLS needs special consideration. TEE, usually performed with patient lying in left-lateral position, is met with an adverse environment for air microbubbles - to travel from right atrium (at higher level) into the left atrium (at lower level) - thus challenging the basic physical fundamentals! We have demonstrated previously that multiple injections of contrast mixture during TCD are safe and "functional-grades" of RLS varies with body positions as larger number of microbubbles are detected in sitting position[5]. Larger studies with controlled conditions for various confounding factors are needed to develop a standardized protocol for RLS detection.

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We have no competing interests with this manuscript