Response to Phenotyping the Microcirculation With Contrast-Enhanced Ultrasound

In their letter, De Boer et al. point to the application of contrast-enhanced ultrasonography to assess microvascular perfusion. We did not cover this approach in our brief review since there is only limited experience with this technique in hypertension research.

Contrast-enhanced ultrasonography is a useful tool in the quantitative evaluation of microvascular blood flow. De Boer et al. summarize the major properties of this imaging tool. A detailed description can be found in the recent review by Greis. Contrast-enhanced ultrasonography has been widely used in musculoskeletal and tumor microvascular research. In the cardiovascul ar domain, the most established application has been in echocardiography. Porter and Xie have recently reviewed the possibilities and limitations of myocardial perfusion imaging with contrast ultrasound. Clinical studies have demonstrated the potential of this technique during stress echocardiography and in the detection of viability of heart tissue.

Di Bello et al. have used quantitative myocardial contrast echocardiography to explore myocardial microcirculatory function in hypertensive patients. They measured an index of myocardial blood flow reserve through the analysis of refilling curves generated by microbubble transit into the myocardium, both at rest and after vasodilatation induced by dipyridamole. They showed that myocardial microcirculation in young adult patients with hypertension showed an early impairment in the vasodilator capacity of the resistance arterioles.

Myocardial contrast echocardiography is a bedside imaging technique with high resolution and great clinical potential. In a more general sense, contrast-enhanced ultrasonography is a valuable technique to phenotype the microcirculation, as pointed out by De Boer et al. However, it is a bedside approach and, therefore, not suited for large-scale population-based microvascular studies. For those studies in hypertensive populations, retinal imaging is now emerging as a useful approach.

Disclosures

None.

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