
Brachial artery FMD with 5-minute distal cuff occlusion—a useful pathophysiological test after all!

Letter to Editor: It seems to me that the erudite arguments of both Drs. Green and Tschakovsky (1) can be correct within the same paradigm; that is, a specific test of brachial artery flow-mediated dilation (FMD), where the ischemic stimulus is provided by a cuff placed distally and the occlusion time is ~5 min, is a good test to reflect arterial nitric oxide release, whereas other variations of FMD in other territories may reflect a variety of complex stimuli and responses.

I thought your readers might enjoy a historical perspective from our early thinking about the development of the FMD test in the brachial artery as an illustration of how good luck plays as important a role as good hypotheses in the generation of novel diagnostic tests.

We chose the brachial artery for testing FMD because it could be easily imaged by conventional high resolution ultrasound technology, whereas the coronary arteries were inaccessible to ultrasound in the early 1990s. We reasoned that the brachial artery was of similar size to the major coronary arteries and so might give useful insights. We wanted to test function of the carotid arteries, but could not think of a way of producing hyperemia there easily, although several of the research fellows did do exercise while rebreathing carbon dioxide to try to stimulate hyperemia in the carotid circulation!

We did indeed choose distal cuff occlusion, as we thought that direct arterial ischemia might confound the endothelium dependence of our measurements. The 5-min time interval, however, was a compromise between an ability to produce significant hyperemia and a comfort level that children and young adults could tolerate.

The passage of time and the wide acceptance of this technique by many research groups around the world speaks to the utility of FMD testing. It is certainly not ready for clinical “prime time” for the detection of an individual’s vascular risk, but we believe that it has been a very useful methodology in clinical research, allowing insights into the risk factors for and treatments of early arterial abnormalities in children and young adults at risk of atherosclerosis.

REFERENCES


David S. Celermajer
Faculty of Medicine
University of Sydney
Sydney, Australia
e-mail: david.celermajer@email.cs.nsw.gov.au