P-222

Exercise testing coupled with Doppler echocardiography : a simple, safe and effective method to assess the severity of coarctation of the aorta.

Ngayap Nemkam H., Houyel L., Leborgne-Meyer A.S., Stos B., Serraf A., Zeitouni R.
Marie-Lannelongue Hospital, Le Plessis-Robinson, France

Peak systolic Doppler velocity at the aortic isthmus alone is not a good predictor of severity in patients with native or residual coarctation after surgical repair. Evaluating the need for surgery or percutaneous stenting is often difficult in these cases. A major argument in favour of a hemodynamically significant aortic isthmus narrowing is the presence of a diastolic gradient with characteristic “sawtooth” appearance of the Doppler pattern.
Objectives: to evaluate, in patients with suspected aortic isthmus narrowing but without any significant diastolic gradient at rest, if exercise could unmask diastolic gradient and thus reveal a hemodynamically significant coarctation.
Methods: Fourteen patients aged from 12 to 56 years underwent treadmill exercise testing coupled with Doppler echocardiography. Thirteen had previous coarctation repair 8 to 43 years before, one had aortic kinking with mild diffuse isthmic narrowing on CT-scan. MRI or CT-scan were performed in 11 patients, significant residual stenosis (narrowing >30%) was detected in 8/11. Exercise testing was maximal or juxtamaximal in all but 1. Doppler measurements were performed during exercise testing and 5 minutes after at the suprasternal notch, using a CW Doppler 2 MHz pedoff probe. The peak systolic and diastolic gradients through aortic isthmus were measured at rest and at the end of the exercise. A peak protodiastolic gradient > 17 mmHg was considered as significant, as described in previous studies.
Results: Mean peak systolic gradient increased from 29 to 65 mmHg with exercise (mean increase +142%, $p<0.001$). Among the eight patients without any diastolic gradient at rest, significant diastolic gradient appeared in 4. Among the 6 patients with non significant diastolic gradient at rest, the gradient remained non significant in 2 and became significant in 4.
Conclusion: Apparition of a significant isthmic Doppler diastolic gradient at exercise can reliably predict the hemodynamic significance of aortic restenosis after coarctation repair, as well as native narrowing of the aorta. This simple, safe and effective non-invasive method may be helpful to identify patients requiring surgery or percutaneous stenting. It could also be useful for the follow-up of patients with a coarctation operated on in infancy.