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Cardiovascular Magnetic Resonance in Greece: Ready for Prime Time?

GEORGIOS PARCHARIDIS

Professor of Cardiology



Magnetic resonance imaging (MRI) has become the primary imaging technique in the routine diagnosis of many disease processes. Although MRI was rapidly accepted as a diagnostic tool for diseases of the brain and spine, its widespread adoption for cardiac diagnosis has taken about 25 years.¹ Some of this delay in clinical application was due to delays in the technological advances necessary for overcoming the respiratory and intrinsic cardiac motion. Tissue characterisation using MRI was considered either unimportant for clinical cardiology or practically unattainable.

It is well known that cardiovascular magnetic resonance (CMR) is the current gold standard technique for the assessment of cardiac volumes and function.² Unlike standard two-dimensional echocardiography, these measurements are obtained without the need to make geometrical assumptions, e.g. that the left ventricle always has an ellipsoidal shape, which are not true for remodelled hearts.³ Moreover, CMR allows the reproducible and accurate measurement of structural and functional (ejection fraction) parameters of the right ventricle that are either neglected or only qualitatively/semi-quantitatively assessed by echocardiography.⁴

One of the major advantages of CMR over other non-invasive imaging techniques is the ability to provide tissue characterisation by showing the spatial distribution of diverse tissue characteristics. Additionally, the image contrast may be further modified by intravenous infusion of contrast agents, which are most frequently chelates of gadolinium. Over the past decade, the late gadolinium enhancement (LGE) technique has completely revolutionised the clinical application of CMR in ischaemic and non-ischaemic

heart disorders. Infarct imaging with LGE-CMR can be used to predict regions that are less likely to improve in function after revascularisation, and is now considered a reference test for myocardial viability.⁵ A growing number of expert centres perform not only viability but also stress CMR studies using pharmacological stressors such as adenosine, dipyridamole or even dobutamine.⁶ According to a recent meta-analysis, stress CMR has high sensitivity and very good specificity for the detection of significant obstructive coronary artery disease.⁷ Perhaps more important is the fact that the LGE technique can be used to detect fibrosis in several diseases other than acute and chronic infarcts, including dilated and hypertrophic cardiomyopathy, sarcoidosis, myocarditis, amyloidosis, and arrhythmogenic right ventricular dysplasia.⁸ The pattern of enhancement in these non-ischaemic disorders is different from the subendocardial or transmural enhancement seen in infarcts, and may have a mid-wall, epicardial, or global subendocardial distribution.

What is the situation with CMR in Greece? Unfortunately, the cardiological community in Greece is not fully aware of the applications of CMR, including its indications, contraindications and advantages over other imaging modalities.⁹ The number of cardiologists or radiologists who have appropriate training in CMR is very small, and those who have appropriate accreditation in CMR are even fewer. There is also a lack of MRI scanners suitable for cardiac imaging in non-private hospitals. Importantly, a few years ago the Hellenic Cardiological Society foresaw the need for training Greek cardiologists in CMR and included CMR training in its scholarship programme. A number of young Greek cardiologists have been trained in

CMR in specialised imaging centres abroad and are expected to bring their knowledge and expertise back to Greece for the benefit of our patients. Together with other experts in the field who are already based in Greece, and ideally under the wings of the working group on CMR of the Hellenic Cardiological Society, they should all advance the application of CMR in our country and pass their knowledge on to cardiology trainees who are interested in learning the technique. This will obviously take time, as CMR training is not officially part of the cardiology training curriculum in Greece.¹⁰ However, the Hellenic Cardiological Society is committed to making every possible effort to support and advance the application of CMR through its annual congress, seminars to trainees, and other educational activities.

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