scale that this figure should be around 53%. This result demonstrates that our clinical criteria actually have a very low predictive ability and that many tests may be unnecessarily performed with a negative result. Furthermore, irrespective of the strategy followed with the patients, the event rate is very low, at around 1% or 2%. These results have led many authors to state that the detection of coronary artery disease must be improved and simplified. The CRESCENT[2] trial was designed with this approach in mind. A simplified CT protocol based on calcium scoring, with full coronary study only being performed when calcium could be detected, was associated with a similar clinical result to ischemia tests, but with a lower cost, shorter time to final diagnosis, and a surprising trend toward a reduction in events during the follow-up period.

Another important reflection comes from analysis of the ability of cardiac CT results to guide treatment in patients in the SCOT-HEART[3] trial. Demonstration of coronary arteriosclerosis with CT led to increased prescription of preventive measures (especially treatment with aspirin, statins, and angiotensin converting enzyme [ACE] inhibitors) and was associated with a 50% reduction in the incidence of death or infarction (17% vs 34%; relative risk, 0.50; 95% confidence interval, 0.28-0.88; $P = .020$) compared with standard care. While the number of events is too low to allow definitive conclusions to be drawn, this study is highly significant, as it is the first to suggest that cardiac CT assessment of the coronary anatomy allows us to choose the most appropriate treatment and change patient prognosis (Figure). In this line, the Motoyama group[4] has demonstrated that there are high-risk morphological signs (low attenuation plaques, positive vessel remodelling) which allow us to choose the group of patients (approximately 10%) who have the highest risk (10 times higher) of experiencing events during the follow-up period. A common result in the PROMISE, SCOT-HEART and PLATFORM trials is that cardiac CT allows better selection of patients who should undergo invasive coronary angiography.

A significant finding in the field of interventional cardiology is that cardiac CT has allowed us to confirm that a not inconsiderable number of patients with percutaneous implantation of an aortic prosthetic valve show reduced mobility of the prosthesis leaflets which is not associated with signs of prosthetic valve dysfunction in the echocardiogram and which returns to normal after anticoagulant treatment with heparin. It has been suggested that this change could be a form of subclinical thrombosis of the prosthetic valve whose clinical significance is still unknown.[5]

Finally, it is important to be aware that the leading imaging societies have published a consensus document in which they propose a standardized nomenclature for creating coronary study reports: the CAD-RADS classification.[6] This classification will improve the reporting of results and will make the decision-making process easier with regard to patient treatment.

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Selection of the Best of 2016 in Cardiac Imaging: Advances in Stress Cardiac Magnetic Resonance

Selección de lo mejor del año 2016 en imagen cardiaca: Novedades en cardiorresonancia magnética de estrés

To the Editor,

In the last decade, stress cardiac magnetic resonance (CMR) imaging has become well-established as an excellent technique for the diagnosis and prognostic stratification of patients with acute or chronic ischemic heart disease.

The main advantages of CMR over other stress techniques relate to the high spatial and temporal resolution (superior to myocardial perfusion scintigraphy), the lack of ionizing radiation, and the high-quality images that are not limited by an echocardiographic window. Stress CMR is diagnostic in more than 97% of cases[1] and can be successfully performed and interpreted in 95% of patients with a body mass index $\geq$ 30. The images allow diagnosis of subendocardial ischemia, nontransmural necrosis, viable myocardium, and dysfunctional myocardium in patients with ischemic heart disease.

Another advantage of stress CRM is its safety and low complication rate. A recent study by Monmeneu et al.,[1] which included 11 984 patients, showed a nonsevere complication rate of 1.5% (there were no deaths or infarcts during the test), with 24.8% of patients experiencing minor symptoms. The presence of inducible ischemia was the main presidposing factor for complications during the test.

From a technical point of view, similarly to other pharmacological stress tests, stress CMR is based on the administration of dipyridamole, adenosine, regadenoson, or dobutamine, and the subsequent assessment of perfusion and myocardial contractility. The degree of transmurality of the perfusion defect relates to the severity of the coronary stenosis. Therefore, there is a good correlation between the presence of inducible perfusion defects on stress CMR and a reduction in the fractional flow reserve on conventional angiography.[2] Patients with myocardial perfusion defects and inducible segmental wall motion abnormalities have a higher rate of complications at follow-up. Therefore, these are the patients who would benefit most from myocardial reperfusion strategies. Although current experience is still limited, the use of regadenoson as a pharmacological stressor offers an excellent diagnostic accuracy for coronary artery disease (93% sensitivity and 89% specificity) without increasing the rate of complications.[3]

One of the most recent technical advances is exercise stress CMR with an MR-compatible treadmill. A multicenter study demonstrated that exercise stress CMR has a specificity of 99%, a negative predictive value of 96%, and strong agreement ($\kappa = 0.82$) with invasive coronary angiography.[4]

In patients with no previous history of ischemic heart disease and an intermediate pretest probability of coronary artery disease, stress CMR has a diagnostic accuracy for coronary disease similar to those of other currently-used imaging tests. Stress CMR has lower sensitivity than computed tomography but higher specificity than other methods.[5] From a prognostic point of view, the presence of myocardial necrosis detected on late enhancement sequences, with associated reversible myocardial perfusion defects, in patients with known ischemic heart disease predisposes them to higher cardiovascular mortality and infarction and complication rates at follow-up. Therefore, a positive stress CMR can effect changes in treatment in up to 70% of patients studied.[6] A recent study demonstrated that the main factors to determine treatment changes are the presence of inducible ischemia, the patient's age, and the absence of known coronary artery disease. In addition, this technique is an excellent aid in the decision to perform revascularization in a patient with chronic coronary occlusion. In this clinical context, revascularization in patients with inducible ischemia on stress CMR is associated with clinical improvement of ventricular volumes and systolic function.

In conclusion, it is fair to say that stress CMR has become established as an excellent investigation for assessing patients with suspected or known coronary artery disease. The test is free from ionizing radiation and is highly safe. Although only preliminary results are available, it is likely that in the future, exercise stress testing (with the additional functional and physical information it offers) may no longer be an intrinsic limitation of the technique.

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