

Title	Evaluation of non-invasive cardiac imaging in diagnosis of chronic coronary artery disease
Agency	HAS, French National Authority for Health (Haute Autorité de Santé) 5 avenue du Stade de France – F 93218 La Plaine Cedex, France Tel.: +33 (0)1 55 93 70 00, contact.seap@has-sante.fr , www.has-sante.fr
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Aim

This assessment originates from three different requests: from the Ministry of Health, the National Health Insurance and professional cardiology and radiology organisations. The objective is to define the place of non-invasive cardiac imaging tests in the diagnostic management of stable coronary artery disease in patients with an intermediate risk (or pretest probability). The objective being to reserve coronary angiography, an invasive test, for patients for whom it is essential (in light of a possible coronary revascularisation).

The non-invasive imaging tests involved in this report are: exercise or pharmacological stress echocardiography, coronary CT scan, pharmacological stress MRI, exercise or pharmacological stress myocardial tomography (SPECT), and positron emission tomography (PET) with ¹⁸FDG.

It should be noted that a first part addressing non-invasive cardiac imaging in non-ST-segment elevation acute coronary syndrome (ACS) at low cardiovascular risk was published by HAS in March 2015.

Conclusions and results

Twenty-two references were analysed as part of this report, including:

- seven good practice guidelines;
- nine health technology assessment reports;
- six clinical studies: three comparison of diagnostic performance studies and three clinical utility studies.

The conclusions from the analysis of the synthetic literature (good practice guidelines and health technology assessment reports) are consistent with the opinions of the stakeholders consulted. The key points are the following:

- the sequence of the diagnostic management of coronary heart disease in a patient with an intermediate pretest probability must be initiated by non-invasive functional testing: exercise or pharmacological stress echocardiography, coronary CT scan, pharmacological stress MRI, exercise or pharmacological stress myocardial tomography (SPECT), and positron emission tomography (PET). Functional exercise tests should be

preferred when feasible, versus a pharmacological stress test;

- no ranking between the functional tests is possible; however, there are elements to consider to guide the choice of test, namely:
 - the patient's characteristics (contraindications and precautions for use of non-invasive imaging tests),
 - the availability of local resources: professionals, expertise and equipment,
 - the degree of irradiation, the ALARA "As Low As Reasonably Achievable" principle (or choice of the lowest dose) must be applied;
- coronary CT scan is a beneficial test for patients with a low intermediate pretest probability (15 - 50%) due to its good negative predictive value.

The studies analysed as part of this assessment do not call into question the conclusions of the synthetic literature (good practice guidelines and international technological assessment reports) and the positions of the stakeholders.

Recommendations

The analysis of all available data indicates a consistency and convergence of conclusions to propose a diagnostic approach based on a flexible algorithm. Thus, HAS recommends that a non-invasive functional stress test be selected as first-line testing, namely exercise or pharmacological stress echocardiography, coronary CT scan, pharmacological stress MRI, exercise or pharmacological stress myocardial tomography (SPECT), and positron emission tomography with *rubidium* (PET with ⁸²Rb). The data from the literature and the opinions of stakeholders do not allow the different tests to be ranked. However, there are points to be taken into consideration for the choice of the initial test. Moreover, HAS believes that the coronary CT scan is a beneficial test for patients with a low intermediate pretest probability (15 - 50%).

Methods

The HAS assessment was based on:

- the systematic assessment and analysis of synthetic documents (good practice guidelines and technological

assessment reports) describing recommended practices and analysis of their consistency between 2010 and 2016;

- assessment and analysis of comparative studies of diagnostic performances from the period of January 2012 (date of publication of the last recommendation) - April 2016;
- assessment and analysis of comparative studies of clinical utility (comparison between technique or between strategy) from the period of January 2012 - April 2016;

The objective of the last two points is to assess the impact that the results of the most recent studies may have on the conclusions for good practice guidelines.

collection of the viewpoint of the National Professional Councils involved (Conseil national professionnel de cardiologie [National Professional Council of Cardiology], Conseil national professionnel de médecine nucléaire [National Professional Council of Nuclear Medicine], Conseil professionnel de la radiologie française [French Professional Council of Radiology]).

Further research/reviews required

Text

Written by

Nassim Brahmi, HAS, France.