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Title Fractional flow reserve (FFR) measurement during coronary angiography

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Aim

The objective was to assess the risk/benefit ratio of FFR (fractional flow reserve) measurement during coronary angiography, in order to obtaining reimbursement for this procedure, following an application from the French Society of Cardiology (SFC). The comparator was a treatment strategy involving a coronary angiogram without FFR measurement. It concerns patients with suspected stable angina or ACS (acute coronary syndrome), including STEMI and NSTEMI, and who have single-vessel or multivessel coronary stenosis.

Conclusions and results

Evidence included five guidelines from learned societies, two assessment reports from health authorities, three randomised clinical trials on the efficacy of the procedure (the multicentre FAME I trial on stable angina, its 2-year follow-up study, and a multicentre trial on NSTEMI), and three trials on safety (including two registries). Some partially randomised clinical trials (DEFER, FAME II) were excluded because they did not compare a group with FFR measurement to a group without FFR measurement.

In stable coronary disease
FFR measurement has a favourable risk/benefit ratio in cases of multivessel lesions or intermediate lesions where previous examinations were not contributory or could not be performed. The benefit at 1 year follow-up for these patients is fewer major adverse cardiac events, if the decision to perform angioplasty with a drug-eluting stent is guided by the FFR measurement (versus a strategy based on coronary angiography results without FFR measurement), according to the FAME I multicentre randomised trial. There are known risks associated with the administration of adenosine; the adverse effects are very rapidly reversible on stopping the adenosine infusion since adenosine has a short half-life, and serious cardiac effects can be managed since coronary angiography labs have equipment for cardiopulmonary resuscitation, and trained medical and paramedical staff. FFR measurement does not significantly increase the procedure time, dose of radiation or volume of contrast compared with coronary angiography alone. The procedure complication rate is about 1% in trained centres.

In STEMI and NSTEMI
No conclusions on the risk/benefit ratio can be reached on the basis of current knowledge.

Methods

The method used was a coherence analysis between guidelines published by learned societies and assessment reports produced by health authorities about this procedure. The literature search included publications in French and English which came out between January 2004 and February 2015.

Due to slight differences in the phrasing of the guidelines in some clinical situations, a critical analysis of meta-analyses and efficacy randomised trials was performed for stable angina and myocardial infarction.

A critical analysis of references about safety of FFR measurement was also performed

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