Measurement of fractional flow reserve offers advantages for certain patients with CHD

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Whether the measurement of the myocardial fractional flow reserve (FFR) in patients with coronary heart disease (CHD) can contribute to an appropriate decision for or against the widening of coronary arteries was the subject of an investigation by the German Institute for Quality and Efficiency in Health Care (IQWiG). The final results are now available. According to these findings, the new function test offers advantages for patients in whom the widening of blood vessels by means of percutaneous coronary intervention (PCI) is planned. In contrast, this is not the case for patients with stable CHD.

The lower the FFR value, the further the blood vessel is narrowed

The FFR is measured during coronary angiography, that is, a cardiac catheterization where a pressure guidewire is inserted into the narrowed vessel. The measurement result, the blood flow reserve, aims to enable a statement on whether the vessel narrowing is relevant and the vessel needs to be widened by an intervention, a so-called revascularization. The lower the FFR value, the lower the blood flow reserve and the lower the flow of blood in the heart muscle tissue.

Two research questions investigated

The Federal Joint Committee (G-BA) commissioned the Institute to assess the benefit of FFR for two separate research questions: According to conventional diagnostics, the widening of blood vessels by means of PCI would be indicated in some patients with CHD. In this procedure, the narrow section of the vessel is extended by means of a balloon ("balloon dilatation") and, if applicable, a stent is subsequently inserted. In this patient group the question is whether a PCI can be avoided by means of FFR.

According to conventional diagnostics, no PCI would be indicated in patients with stable CHD. Conversely, in this patient group the question is whether FFR can identify patients in whom the flow of blood is so decreased that revascularization is medically necessary after all.

Results of nine RCTs considered

The IQWiG researchers searched for studies that - for the respective patient groups - compared an FFR-guided with an FFR-independent treatment decision, in each case in respect of patient-relevant outcomes such as mortality, the occurrence of myocardial infarctions and complications, the necessity of hospital stays or health-related quality of life. They identified a total of nine randomized controlled trials (RCTs) whose results could be considered in the assessment.

Myocardial infarctions occurred less often with FFR

As the data from five studies on patients with an indication for PCI show, myocardial infarctions occur less often if the treatment decision was made on the basis of the FFR. The IQWiG researchers rate the certainty of conclusions as high here and see proof of a benefit of FFR.

For the combined outcome of death or myocardial infarction they infer

an indication of a benefit from the data.

In contrast, they see no hint of a benefit or harm for the following outcomes: mortality (all-cause mortality), cardiac mortality, cardiac death or myocardial infarction, repeat coronary revascularization, angina pectoris, heart failure, and adverse events. No data were available on the outcomes of cardiac arrhythmia, health-related quality of life, and necessity of further hospital stays.

Stable CHD: neither hint of benefit nor harm

The conclusion is different in the second patient group with stable CHD, that is, patients for whom no PCI is planned on the basis of conventional diagnostics. Here the data show either no relevant differences (all-cause mortality, cardiac mortality, death or myocardial infarction, cardiac death or myocardial infarction, myocardial infarction, angina pectoris, adverse events), or they are uninterpretable (repeat coronary revascularization), or not available at all (cardiac arrhythmia, heart failure, health-related quality of life, repeat hospitalization).

Process of report production

IQWiG published the preliminary results in the form of the preliminary report in August 2016 and interested parties were invited to submit comments. At the end of the commenting procedure, the preliminary report was revised and sent as a final report to the commissioning agency in November 2016. The written comments submitted were published in a separate document together with the final report. The report was produced in collaboration with external experts.

More information: www.iqwig.de/en/projects-resul … rt-disease.6910.html

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