

Efficacy of stents is improved when their placement is determined by arterial blood flow measurement

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Reperfusion therapy in the form of percutaneous coronary intervention (PCI) is now the recommended first treatment for victims of acute myocardial infarction. New European guidelines issued in November 2008 emphasised speed of action and the importance of reperfusion therapy to restore blood flow to the heart and improve survival rates. The benefits of PCI are less clear in patients with stable coronary artery disease; PCI has been shown to improve symptoms, but the impact on prognosis is still a matter of debate.

The cornerstone of PCI is the technique of angioplasty, by which either bare-metal or drug-releasing stents are located within the coronary arteries at points of occlusion. The FAME study, reported in the 15 January issue of the *New England Journal of Medicine*, was a randomised trial designed to assess the most effective method of locating the stent in patients with multivessel disease: conventional angiography (visualisation of the artery) or a new technique of "fractional flow reserve" (FFR), by which a tiny wire with a sensor is threaded through the coronary artery to the point of occlusion and blood flow measured to determine if the lesion is restricting blood flow and causing ischemia.

The study, conducted in 20 European and US centres, randomised more than 1000 patients with multivessel coronary disease to either of the two methods for placement of stents. Results showed that one-third fewer stents were used in the FFR group and the difference in composite

outcome at one year was significant: the FFR group showed a 28% lower incidence of major adverse cardiac events (repeat angioplasty, heart attack or death) - 18.3% vs. 13.2%.

The implication in these results is that placing stents in lesions not responsible for ischemia is not only unnecessary, but may cause worse outcomes.

Commenting on the study on behalf of the European Society of Cardiology, Professor Uwe Zeymer from the Herzzentrum, Ludwigshafen, Germany, said that, while PCI is clearly beneficial for the relief of symptoms in patients with stable angina, the prognostic impact of PCI in the patient group in this study is still a matter of debate. One reason for this, he explained, may be that some stent procedures are performed solely on the basis of "oculo stenotic reflex" (the visual presence of a stenosis).

However, he added: "One method which is easy to perform and readily available during diagnostic angiography is measurement of the fractional flow reserve, a method which can distinguish between hemodynamically relevant and irrelevant stenoses. The latter do not need intervention and can be safely treated with medical therapy. The FAME study has now shown that by using FFR we can improve the prognosis of patients and reduce the number of unnecessary interventions. As a result, this method should be used in patients with stable symptoms and without documentation of ischemia by another method. In patients with multivessel disease in particular, FFR can increase the safety and efficacy of coronary revascularisation. In addition, FFR seems cost effective and avoids unnecessary and potentially harmful interventions."

Reference: Tonino PAL, De Bruyne B, Pijls NH, et al. Fractional flow reserve versus angiography for guiding percutaneous coronary angiography. N Engl J Med 2009; 360: 213-224.

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