

Title:	Coronary pressure wire, 2006
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Aim

To assess the safety, effectiveness and cost effectiveness of measuring fractional flow reserve (FFR) and coronary flow reserve (CFR) with coronary pressure wire (CPW) when evaluating the need for percutaneous coronary intervention (PCI) and when evaluating the effectiveness of PCI and the circumstances under which public funding should be supported.

Conclusions and results

Safety

Twenty-six studies, involving 2639 participants, were identified that met the eligibility criteria for the safety component of the review. The great majority of adverse effects reported were self limiting in nature. There was one episode of severe bronchospasm. Two type B coronary dissections were also reported, but these adverse events did not require any specific intervention. Therefore, the measurement of FFR was associated with a satisfactory safety profile.

Effectiveness

There were four groups of studies examining the use of CPW when evaluating the need for PCI: randomised controlled trials; comparison of FFR with a reference standard (the “triple stress test”); non-randomised studies following patients divided into groups according to FFR level; and non-randomised studies that followed patients with specified FFR levels. The RCTs provided the most reliable design. Overall, there was high-level evidence supporting FFR measurement (by the use of CPW) in patients with single lesion disease in determining whether to proceed or defer coronary intervention at the time of angiography. It was less clear from this high-level evidence whether FFR measurement was more effective than stress testing. However, there were data supporting FFR having similar accuracy to stress testing and that the measurement of FFR results in change in management. Only four studies were identified that met the eligibility criteria for evaluation of the effectiveness of PCI. Three were registry-based studies that did not incorporate any change in management in association with an adverse FFR measurement. It was unclear if a measurement of FFR would improve health outcomes among those with low FFR levels.

Cost Effectiveness

Cost-minimisation analysis was used to identify the most cost effective strategy. The expected cost per patient, and therefore total annual costs, is expected to be lower for a strategy of stress testing prior to a decision to proceed with PCI than for a strategy of FFR measurement prior to a decision to proceed with PCI. The difference, however, is small and the resulting cost effectiveness ratio is likely to be similar for the two strategies. Both of these strategies are expected to be associated with significantly lower cost-effectiveness ratios than a strategy of proceeding directly to PCI.

Recommendations

MSAC recommended that public funding should be supported for the use of coronary pressure wires to determine whether revascularisation should be performed on intermediate lesions identified on coronary angiography, where previous stress testing has either not been performed or the results are inconclusive but should not be supported for the use of coronary pressure wires to assess the effectiveness of percutaneous coronary interventions.

Method

A systematic review of the use of CPW for evaluating the need for, and effectiveness of, PCI was conducted. The literature was searched up to December 2004 using Medline, Embase, Current Contents, Science Citation Index, Cochrane Library, DARE, and various website sources. Study selection criteria were stipulated and standard checklists were used to appraise study quality.

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