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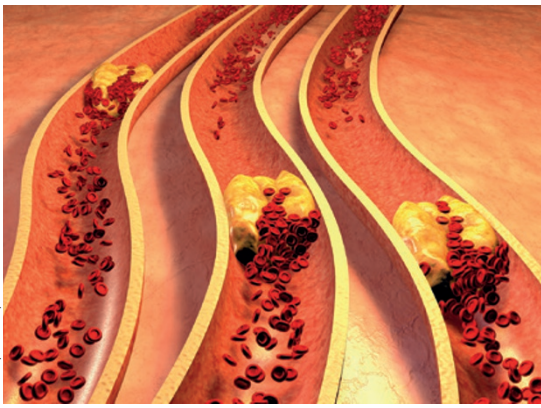
CORONARY ARTERY DISEASE

Complete revascularization in patients with multivessel disease



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A strategy of complete revascularization guided by fractional flow reserve (FFR) in patients with ST-segment elevation myocardial infarction (STEMI) and multivessel disease is safe and reduces the need for repeat revascularization. This finding, published in *The Lancet*, comes from the DANAMI-3–PRIMULTI trial, and builds on previous findings from the CVLPRIT and PRAMI studies.

After successful primary percutaneous coronary intervention (PCI) in patients with STEMI, guidelines about when and how to treat clinically significant coronary stenoses in arteries other than the culprit vessel are equivocal. Gregg W. Stone, who was not involved in the DANAMI-3–PRIMULTI trial, explains that three potential courses of action are available: "immediate treatment during the acute infarct procedure, deferred but routine treatment, or a conservative approach directed by recurrent symptoms or functional testing".

In the open-label, randomized, controlled DANAMI-3–PRIMULTI trial, 627 patients with STEMI and multivessel disease were recruited from two university hospitals in Denmark. After successful PCI of the infarct-related artery, 313 patients were randomly assigned to no further invasive treatment; the remaining 314 were allocated to complete revascularization guided by FFR values. The primary end point (a composite of all-cause mortality, nonfatal reinfarction, and ischaemia-driven revascularization of lesions in non-infarct-related arteries) was assessed after the last patient to be enrolled had been followed up for 1 year (median follow-up 27 months, range 12–44 months). The primary end point occurred in 22% of patients who underwent PCI in the infarct-related artery only, compared with 13% of patients who received complete revascularization (HR 0.56, 95% CI 0.38–0.83, $P = 0.004$). The benefit of FFR-guided complete revascularization was driven by a significantly reduced need for subsequent revascularization of non-infarct-related lesions (HR 0.31, 95% CI 0.18–0.53, $P < 0.0001$). No significant difference was observed in all-cause mortality or nonfatal reinfarction, although the investigators note that the number of patients enrolled meant that the study was not adequately powered to detect differences in these outcomes.

The investigators conclude that "to avoid repeat revascularizations, patients can safely have all their lesions treated during the index admission". Dr Stone cautions that "all three trials [DANAMI-3–PRIMULTI, CVLPRIT, and PRAMI] have been moderately sized, and they are important in suggesting that the early, routine interventional approach is safe, but a large randomized trial is necessary to prove this definitely, as well as to precisely quantify the type and degree of benefit".

In an editorial that accompanied the trial report in *The Lancet*, Carlo Di Mario and Gareth Rosser agree that "the results of these three trials indicate that treatment of the clinically significant non-infarct-related lesions delivers better results than does leaving them under medical treatment". However, they note that cardiologists still do not have definite information about the best timing for treatment of multivessel disease, so "they must use good clinical judgement, a skill sometimes neglected when the emphasis is on strict adherence to protocols". According to Di Mario and Rosser, "the severity and complexity of the non-infarct-related lesion in probably the most important factor" in determining time of intervention for nonculprit lesions.

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Original article Engstrøm, T. *et al*. Complete revascularisation versus treatment of the culprit lesion only in patients with ST-segment elevation myocardial infarction and multivessel disease (DANAMI-3—PRIMULTI): an open-label, randomised controlled trial. *Lancet* doi:10.1016/S0140-6736(15)60648-1