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Evaluation of Infarct-Related Coronary Artery Patency and Microcirculatory Function After Facilitated Percutaneous Primary Coronary Angioplasty

The FINESSE-ANGIO (Facilitated Intervention With Enhanced Reperfusion Speed to Stop Events–Angiographic) Study

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Objectives The FINESSE-ANGIO (Facilitated Intervention with Enhanced Reperfusion Speed to Stop Events–Angiographic) study evaluated acute treatment effects on infarct-related artery (IRA) patency and angiographic correlates of coronary microcirculatory function.

Background The FINESSE trial evaluated the effects on clinical outcomes of primary percutaneous coronary intervention (PCI) facilitated with pre–catheterization laboratory administration of abciximab with half-dose reteplase (combination-facilitated group), abciximab alone (abciximab-facilitated group), or with abciximab administered immediately before the procedure (primary PCI).

Methods The FINESSE-ANGIO substudy compared the effects of the 3 treatment strategies on patency (TIMI [Thrombolysis In Myocardial Infarction] flow grade 2/3) of the IRA at basal coronary angiography. The secondary efficacy end points were corrected TIMI frame count, percentage of patients achieving TIMI flow grade 3, and the percentage achieving myocardial blush grade 2/3 of the IRA at post-PCI angiography. All angiographies were evaluated at a central core laboratory.

Results Of the 2,452 FINESSE patients, 637 were included in the FINESSE-ANGIO substudy. Patients in the combination-facilitated group exhibited significantly higher rates of baseline IRA patency compared with the abciximab-facilitated and the primary PCI groups (76.1% vs. 43.7% and 32.7%, respectively; $p < 0.0001$ for both; $p = 0.025$ abciximab-facilitated vs. primary PCI). There were no significant differences in the post-PCI corrected TIMI frame count (17.1 ± 15.8, 17.4 ± 17.3, and 15.8 ± 14.1) or the rates of post-PCI TIMI flow grade 3 (79.8%, 77.7%, and 76.6%), myocardial blush grade 2/3 (85.6%, 79.5%, and 86.4%), respectively.

Conclusions Pre–catheterization laboratory administration of abciximab alone and especially in combination with half-dose reteplase resulted in higher rates of IRA patency at baseline coronary angiography compared with no pre-treatment. However, post-procedural angiographic and microcirculatory variables were unaffected by facilitation therapy. (J Am Coll Cardiol Intv 2010;3:1284–91)

It is well established that any delay in reperfusion therapy during ST-segment elevation myocardial infarction (STEMI) can limit the benefit of either thrombolysis (1–3) or primary percutaneous coronary intervention (PCI) (4–6). In addition, even successful recanalization of the infarct-related artery (IRA) may not result in reperfusion of the coronary microcirculation, that is, of the myocardium, due to mechanisms that are still not completely understood but include embolization of thrombotic material from the treated lesion, adhesion of platelets and leukocytes to the injured endothelium, and inflammation and acute myocardial ischemia (7).

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Previous studies have shown that early administration of abciximab, a glycoprotein (GP) IIb/IIIa inhibitor, enhances IRA patency (8–11). Angiographic studies in patients with STEMI (12) have shown that the combination of a GP IIb/IIIa blocker and fibrinolytic agent increases the IRA TIMI (Thrombolysis In Myocardial Infarction) flow grade 3 at 60 and 90 min compared with fibrinolytic therapy alone. Other reports revealed improved microcirculatory perfusion as assessed by myocardial blush grade (MBG and ST-segment resolution) (13,14).

The FINESSE (Facilitated Intervention with Enhanced Reperfusion Speed to Stop Events) study was designed to evaluate the effects on clinical outcomes at 90 days after the immediate administration of abciximab in conjunction with half-dose reteplase or abciximab alone before PCI, compared with primary PCI with post-angiography abciximab administration in the catheterization laboratory in patients with STEMI with an expected delay to angioplasty of at least 60 min (15). No significant reduction in the 90-day primary ischemic end point was seen with either facilitated approach, although nonsignificant favorable trends with facilitation therapy were seen for some patient subgroups (16).

This FINESSE-ANGIO study is a substudy of FINESSE designed to evaluate the acute effects of the 3 aforementioned treatments on IRA patency and angiographic correlates of coronary microcirculatory function.

Methods

Study design. The FINESSE-ANGIO study's patients included FINESSE participants from 6 countries (Italy, France, United Kingdom, Spain, the Netherlands, and Poland). Eligibility criteria for FINESSE-ANGIO mirror those for FINESSE (16). Internal review boards of all institutions approved the study. All patients provided additional written informed consent.

The FINESSE study's patients were randomly assigned in a 1:1:1 ratio to receive half-dose reteplase plus abciximab (combination-facilitated PCI), abciximab alone (abciximab-facilitated PCI), or placebo immediately following randomization with abciximab administered in the catheterization laboratory after angiography in this group (primary PCI). Heparin was limited to 40 U/kg with a target activated clotting time of 200 to 250 s.

Abbreviations and Acronyms

cTFC = corrected TIMI frame count
GP = glycoprotein
IRA = infarct-related artery
MBG = myocardial blush grade
PCI = percutaneous coronary intervention
QCA = quantitative coronary angiography
STEMI = ST-segment elevation myocardial infarction
TIMI = Thrombolysis In Myocardial Infarction

Study procedures. Stent implantation at the IRA lesion site was strongly encouraged, but devices to trap embolic materials and prevent clot embolization or techniques to aspirate the intracoronary thrombus were discouraged. After stent implantation, drugs such as adenosine or calcium-antagonists that improve the contrast runoff of the epicardial vessels were permitted.

Study end points. The primary efficacy end point was the percentage of patients achieving TIMI flow grade 2/3 of the IRA at first angiography. Secondary efficacy end points included: 1) the percentage of patients achieving TIMI flow grade 3 flow of the IRA; 2)

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