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Lessons from the trials

STREAM at one year: Further evidence supporting a pharmacoinvasive strategy in patients with STEMI

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ABSTRACT
We examine the one-year mortality rates from the STREAM trial, recently published in *Circulation*.

INTRODUCTION
Primary percutaneous coronary intervention (PPCI) is currently the preferred reperfusion therapy for patients presenting with acute ST-segment elevation myocardial infarction (STEMI) when it can be performed by an experienced team in a timely fashion.[1] However, this is not feasible in many areas around the world. In such instances, a pharmacoinvasive strategy consisting of early fibrinolysis followed by transfer to a PCI-capable hospital, for either immediate (rescue) PCI for patients with failed thrombolysis, or for non-urgent coronary angiography to determine the need for additional revascularization within 3-24 hours, is a reasonable alternative.[2,3] The Strategic Reperfusion Early After Myocardial Infarction (STREAM) trial[4] compared a pharmacoinvasive strategy to PPCI in STEMI patients presenting within 3 hours from symptom onset, but unable to undergo PPCI within one hour.
The study's design as well as results at 30 days have previously been discussed in the Journal.[5]
The investigators recently reported mortality rates at one year in *Circulation*.[6]

RESULTS
patients died between 30 days and one year; 20 in the pharmacoinvasive arm and 14 in the PPCI arm. Only 14 patients (out of the 34) died from cardiac causes. At one year, all-cause mortality did not differ between both groups (6.7% vs. 5.9% for the PPCI and pharmacoinvasive groups respectively, p = 0.49, risk ratio = 1.13, CI 0.79-1.62). Cardiac mortality rates were also similar in both groups (4% vs. 4.1% for the PPCI and pharmacoinvasive groups respectively, p = 0.93). The investigators did not report the primary endpoint – composite of death, shock, congestive heart failure, or reinfarction – in this communication. The dose of tenecteplase in patients older than 75 years was amended after enrollment of approximately 20% of the study's population due to an alarming rate of intracranial hemorrhage (ICH) in this subgroup (3 out of 37 patients). No ICH events were reported after the amendment (50% of the regular dose). The authors concluded that a dose-adjusted pharmacoinvasive approach offers a safe and effective alternative reperfusion strategy to a substantial number of STEMI patients worldwide where timely PPCI is unattainable.

DISCUSSION
One-year results from STREAM confirm the earlier findings from the same study and support the current recommendations in European and American practice guidelines. STREAM also demonstrated the

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safety of adjusted-dose fibrinolytics in elderly patients, a group who are frequently denied fibrinolytic therapy for concerns about the significantly increased risk of ICH. The efficacy of this strategy warrants further investigation. It is important to note that STREAM randomized a highly selected group of STEMI patients, namely very early presenters (within 3 hours of symptom onset), unable to undergo PPCI within one hour, had at least 2mm ST-segment elevation on their ECG at presentation, and all those randomized to the pharmacoinvasive arm received prehospital tenecteplase. Collectively, these highly selective criteria led to a very slow enrolment process; 4 years to recruit 1915 patients from 99 sites in 15 countries. STREAM is therefore not an all-comers trial by any means, and its results should not be generalized to the broader STEMI population.

WHAT HAVE WE LEARNED?

PPCI, when delivered in a timely manner by an experienced team, remains the reperfusion strategy of choice in patients presenting with STEMI. It is also the strategy of choice regardless of the time delays in patients presenting with cardiogenic shock and in those with contraindications to fibrinolysis. When timely PPCI cannot be performed, fibrinolysis (unless contraindicated) followed by coronary angiography is recommended. The use of half-dose fibrinolytic therapy in elderly patients is probably safe, but its efficacy requires further evaluation.

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