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## Lessons from the trials

**TASTE: To aspirate, or not to aspirate, remains a question**

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**INTRODUCTION**

Coronary artery thrombus aspiration is a simple, rapidly performed, and relatively inexpensive adjunctive therapy in primary percutaneous coronary intervention (PCI). It may protect the microcirculation from distal embolization and improve distal coronary blood flow,<sup>1-4</sup> although this is not a universal finding.<sup>5,6</sup> Furthermore, a recent meta-analysis pointed to an increased risk of stroke with thrombus aspiration.<sup>7</sup> So the overall data derived from clinical trials are neither concordant nor fully conclusive. The Thrombus Aspiration in ST-Elevation Myocardial Infarction in Scandinavia (TASTE) trial was conducted in an attempt to settle this controversy.<sup>8</sup>

**THE STUDY**

The TASTE trial was a multicenter, prospective, open-label, randomized, controlled clinical trial that was published in *The New England Journal of Medicine* in October 2013. The trial participants were enrolled from the national comprehensive Swedish Coronary Angiography and Angioplasty Registry (SCAAR). A total of 7244 patients presenting with STEMI for whom PCI was planned were randomly assigned, in a 1:1 ratio, to thrombus aspiration followed by PCI, or to PCI only. Patients were treated according to current practice guidelines, with a high proportion of PCIs performed through a radial access, and including implantation of drug-eluting stents.

The primary end point was all-cause mortality at 30 days. The secondary end points included 30-day rates of hospitalization for recurrent myocardial infarction, stent thrombosis, target-vessel revascularization (TVR), target-lesion revascularization (TLR), and the composite of all-cause mortality or recurrent myocardial infarction (MI). Additional secondary end points, for which data were also obtained from the registries and assessed during the index hospitalization, included complications of PCI, stroke or neurologic complications, heart failure, and length of hospital stay.

**RESULTS**

There were no statistically significant differences between both groups regarding the patients' demographic data, prevalence of traditional risk factors of atherosclerosis, door-to-balloon times or adjunctive medical therapy.

By 30 days, the incidence of the primary end-point (all-cause mortality) did not differ between both groups (2.8% vs. 3.0% in the thrombus aspiration plus PCI and PCI-only groups respectively;  $p = 0.63$ ). The rate of re-hospitalization due to re-infarction was 0.5% in the thrombus-aspiration group and 0.9% in the PCI-only group ( $p = 0.09$ ). The rates of stent thrombosis, target-lesion revascularization, and target-vessel revascularization did not differ significantly between the groups. There was no significant differences between both groups in terms of stroke or neurologic complications, perforation or tamponade, heart failure or left ventricular dysfunction at the time of discharge, nor was there a significant difference in the length of hospital stay.

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## DISCUSSION

The TASTE trial presents a unique randomization model; being an online, comprehensive, national clinical registry, thus combining the benefits of randomized treatment assignment with the best features of a large-scale clinical registry. The trial also looked into hard clinical end-points, such as reduction in mortality, MI, and stent thrombosis, and found no significant benefit of aspiration thrombectomy with respect to mortality or any of several other clinical outcomes at 30 days. Although there were trends toward reduction in the risk of hospitalization for recurrent MI at 30 days and the risk of stent thrombosis with thrombus aspiration, these differences failed to achieve statistical significance.

Results of TASTE added more confusion to an already hotly-debated issue in primary PCI. In contrast to its findings, “The Thrombus Aspiration During Percutaneous Coronary Intervention in Acute Myocardial Infarction (TAPAS) study”, demonstrated better reperfusion with thrombus aspiration accompanied by significantly better resolution of ST-segment changes.<sup>9</sup> Interestingly, TAPAS suggested a survival benefit with thrombus aspiration among patients with STEMI as a secondary end point after one year follow up. One possible explanation to this discrepancy is the short follow-up period (30 days) in TASTE, upon which the conclusion of no benefit of thrombus aspiration in the setting of primary PCI was deducted. Whether a difference in mortality between both groups can emerge at one-year (or beyond) remains to be seen. Another concern is the fact that data for left ventricular dysfunction and heart failure were derived during the index hospitalization. It would have been worth noting if these two important clinical outcomes were compared between the two groups at the end of follow up period.

TASTE finally leaves us with a weak signal of benefit in favor of thrombus aspiration; a statistically insignificant trend toward reduced re-hospitalization for recurrent MI and lower incidence of stent thrombosis – both of which are clinically important findings that should be considered in decision-making during primary PCI.

## WHAT HAVE WE LEARNED?

Current evidence does not support the routine use of thrombus aspiration devices in the setting of STEMI, but it also does not suggest any harm in using these devices. The benefits of thrombus aspiration may only be limited to improved visualization of the lesion after aspiration, and possibly, improved reperfusion and myocardial salvage. Whether this represents enough justification for its use, despite the lack of impact on survival or other clinical endpoints, remains an unanswered question. Until further data is available, “common sense” will continue to guide when, where and how these devices are used.<sup>10</sup>

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