Intracoronary Versus Intravenous Abciximab Bolus in Patients With ST-Segment Elevation Myocardial Infarction
1-Year Results of the Randomized AIDA STEMI Trial

To the Editor: In patients with ST-segment elevation myocardial infarction (STEMI), direct intracoronary as compared with standard intravenous bolus administration of the glycoprotein IIb/IIIa receptor antagonist abciximab acutely causes higher local drug concentrations, greater glycoprotein IIb/IIIa receptor occupancy, and enhanced inhibition of platelet aggregation at the site of thrombus and downstream within the coronary capillary bed (1). These effects might exert a protective effect on the myocardial microcirculation at the time of reperfusion.

At short-term follow-up (90 days), the largest randomized trial to date (AIDA STEMI [Abciximab Intracoronary Versus Intravenous Drug Application in STEMI]) comparing intracoronary and intravenous abciximab bolus administration in patients with STEMI undergoing primary percutaneous coronary intervention (PCI) could not show a significant difference in a composite major adverse cardiac events endpoint, mortality, reinfarction, or bleeding between the 2 delivery routes (2). However, there were significantly fewer episodes of new congestive heart failure in patients randomized to intracoronary abciximab bolus administration. The present analysis reports 12 months of clinical results of the AIDA STEMI trial.

In brief, AIDA STEMI randomized 2,065 patients with acute STEMI undergoing primary PCI to either intracoronary or intravenous abciximab bolus application with subsequent 12-h intravenous infusion. All patients received dual oral antiplatelet therapy (aspirin and either clopidogrel or prasugrel). The primary endpoint was a composite of all-cause death, reinfarction, or new congestive heart failure at 90 days.

For the predefined 12-month follow-up, the primary analysis was performed for all patients who underwent randomization and had follow-up information according to the intention-to-treat principle. Predefined subgroup analyses were performed for patient age, infarct location, Killip class, post-procedural Thrombolysis In Myocardial Infarction (TIMI) flow, time from symptom onset to randomization, and thrombectomy versus no thrombectomy. Exploratory post hoc analyses were performed for: 1) TIMI risk score of <5 versus ≥5; and 2) prasugrel versus no prasugrel comedication.

Of the 2,065 patients enrolled, 1,876 patients underwent short-term clinical follow-up at 90 days, whereas 189 patients were excluded for reasons previously outlined (2). At 12 months, follow-up was available for 1,846 patients (intracoronary group 925; intravenous group 921; 98.4% follow-up rate relative to the 90-day landmark). Baseline characteristics were well matched between groups. The composite endpoint of death, reinfarction, and new congestive heart failure was not significantly different between patients assigned to intracoronary versus intravenous abciximab bolus administration (Table 1). A total of 51 patients (5.5%) had died in the intracoronary compared with 42 (4.6%) in the intravenous group (p = 0.39) (Table 1). At the 90-day landmark, more episodes of new congestive heart failure in patients randomized to intravenous abciximab had been observed, albeit at a p value of 0.04 only on the verge of statistical significance (2). At 12 months, the observed numerical difference in event rates proved to be no longer significantly different (p = 0.07), supporting the hypothesis that this finding is most likely due to chance. Consistent with the overall cohort, predefined as well as post hoc analyses revealed no significant differences in results across a wide range of subgroups with regard to the combined endpoint of death, reinfarction, and new congestive heart failure with the exception of female patients, who seemed to benefit from intracoronary bolus administration (odds ratio: 0.55; 95% Confidence Interval: 0.33 to 0.91).

The results of the present analysis suggest that in patients with acute STEMI undergoing primary PCI and treated with dual oral antiplatelet therapy, direct intracoronary compared with standard intravenous bolus administration of abciximab does not result in significant differences with regard to hard clinical endpoints. This might seem surprising given previous data that direct intracoronary compared with intravenous abciximab bolus administration was associated with a variety of beneficial effects on surrogate markers in patients with STEMI. Several considerations may serve to

### Table 1: Clinical Outcome at 1 Year

<table>
<thead>
<tr>
<th></th>
<th>Intracoronary Abciximab (n = 925)</th>
<th>Intravenous Abciximab (n = 921)</th>
<th>p Value</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite endpoint (death, reinfarction, congestive heart failure)</td>
<td>85 (9.2)</td>
<td>90 (9.8)</td>
<td>0.69</td>
<td>0.93</td>
<td>0.68–1.28</td>
</tr>
<tr>
<td>Death</td>
<td>51 (5.5)</td>
<td>42 (4.6)</td>
<td>0.39</td>
<td>1.22</td>
<td>0.80–1.86</td>
</tr>
<tr>
<td>Reinfarction</td>
<td>27 (2.9)</td>
<td>27 (2.9)</td>
<td>1.00</td>
<td>1.00</td>
<td>0.58–1.71</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>27 (2.9)</td>
<td>42 (4.6)</td>
<td>0.07</td>
<td>0.63</td>
<td>0.38–1.03</td>
</tr>
</tbody>
</table>

Values are n (%).

CI = confidence interval; OR = odds ratio.
explain these findings. First, despite being the largest trial studying intracoronary abciximab administration to date, AIDA STEMI might have been underpowered to detect small differences in clinical endpoints. Second, AIDA STEMI used an “all-comers” design. However, it is possible that intracoronary abciximab might only be advantageous in selected patients such as those with high thrombus burden, total occlusion, or reduced flow. AIDA STEMI subgroup analyses, however, do not support a selective benefit of intracoronary over intravenous bolus abciximab in high-risk patients. Third, the magnitude of the short-lived local effect of intracoronary abciximab might not be enough to produce changes in clinically meaningful endpoints, especially in the era of routine preloading with other potent antiplatelet agents. Fourth, in the AIDA STEMI trial, abciximab was injected through the guiding catheter after wiring of the infarct-related artery. Although easy to implement in clinical practice, this way of delivery might be suboptimal in selected patients because of inadequate thrombus penetration of abciximab and possible retrograde washout into the ascending aorta. Novel application systems such as dedicated perfusion catheters might exert superior efficacy by allowing high local drug concentrations in both vessel lumen and wall at the site of thrombus with prolonged focal dwelling times (3).

In conclusion, AIDA STEMI does not support a possible clinical superiority of intracoronary bolus delivery. (Abciximab IV Versus IC in ST-Elevation Myocardial Infarction [AIDA STEMI]; NCT00712101)

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REFERENCES


Letters to the Editor

Post-Conditioning at the Ischemic Region of the Heart to Prevent Acute Kidney Injury in Patients With Non–ST-Segment Elevation Myocardial Infarction

We read with great interest the paper by Deftereos et al. (1). The authors proposed a reduced effect of ischemic post-conditioning at the ischemic region of the heart on the incidence of acute kidney injury in patients with non–ST-segment elevation myocardial infarction (non–STEMI) undergoing percutaneous coronary intervention (PCI).

Accumulating evidence has suggested that prolonged ischemic duration before reperfusion is a critical determinant of infarct size and determines the infarct size–limiting effect by post-conditioning (2–5). Protective stimulus induced by postconditioning has been confirmed in patients with STEMI within 6 to 12 h of symptom onset to balloon time (6,7). However, the stimulus effectiveness by post-conditioning for a more prolonged time after symptom onset has not been elucidated. On the other hand, the remote organ used for effective conditioning usually does not have pre-existing ischemic injury in clinical practice (8,9).

In this study, they enrolled patients with non–STEMI undergoing PCI within 72 h after symptom onset. This is obviously a wide range of ischemia duration. Moreover, the mean symptom onset to balloon time was not reported in the post-conditioning and control groups. The potential difference in this time between these 2 groups may result in evident confounding bias. Therefore, we are interested to know whether the onset time to PCI was evenly distributed between the post-conditioning group and the control group.