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EXPEDITED PUBLICATIONS

Intracoronary Compared With Intravenous Bolus Abciximab Application During Primary Percutaneous Coronary Intervention in ST-Segment Elevation Myocardial Infarction

Cardiac Magnetic Resonance Substudy of the AIDA STEMI Trial

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Objectives The aim of the AIDA STEMI (Abciximab i.v. Versus i.c. in ST-elevation Myocardial Infarction) cardiac magnetic resonance (CMR) substudy was to investigate potential benefits of intracoronary versus intravenous abciximab bolus administration on infarct size and reperfusion injury in ST-segment elevation myocardial infarction.

Background The AIDA STEMI trial randomized 2,065 patients to intracoronary or intravenous abciximab and found similar rates of major adverse cardiac events at 90 days with significantly less congestive heart failure in the intracoronary abciximab group. CMR can directly visualize myocardial damage and reperfusion injury, thereby providing mechanistic and pathophysiological insights.

Methods We enrolled 795 patients in the AIDA STEMI CMR substudy. CMR was completed within 1 week after ST-segment elevation myocardial infarction. Central core laboratory–masked analyses for quantified ventricular function, volumes, infarct size, microvascular obstruction, hemorrhage, and myocardial salvage were performed.

Results The area at risk ($p = 0.97$) and final infarct size (16% [interquartile range: 9% to 25%] versus 17% [interquartile range: 8% to 25%], $p = 0.52$) did not differ significantly between the intracoronary and the intravenous abciximab groups. Consequently, the myocardial salvage index was similar (52 [interquartile range: 35 to 69] versus 50 [interquartile range: 29 to 69], $p = 0.25$). There were also no differences in microvascular obstruction ($p = 0.19$), intramyocardial hemorrhage ($p = 0.19$), or ejection fraction ($p = 0.95$) between both treatment groups. Patients in whom major adverse cardiac events occurred had significantly larger infarcts, less myocardial salvage, and more pronounced ventricular dysfunction.

Conclusions This largest multicenter CMR study in ST-segment elevation myocardial infarction patients to date demonstrates no benefit of intracoronary versus intravenous abciximab administration on myocardial damage and/or reperfusion injury. Infarct size determined by CMR was significantly associated with major adverse cardiac events. (Abciximab i.v. Versus i.c. in ST-elevation Myocardial Infarction [AIDA STEMI]; NCT00712101) (J Am Coll Cardiol 2013;61:1447–54) © 2013 by the American College of Cardiology Foundation

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Abbreviations and Acronyms

CMR = cardiac magnetic resonance

IQR = interquartile range

LV = left ventricular

MACE = major adverse cardiac event(s)

MO = microvascular obstruction

PCI = percutaneous coronary intervention

STEMI = ST-segment elevation myocardial infarction

Randomized studies have consistently shown that treatment with an adjunctive glycoprotein IIb/IIIa inhibitor improves coronary microcirculation and clinical outcome in high-risk ST-segment elevation myocardial infarction (STEMI) patients undergoing primary percutaneous coronary intervention (PCI) (1,2). Intracoronary abciximab bolus administration results in higher local concentrations and increased levels of platelet glycoprotein IIb/IIIa receptor occupancy compared with standard intravenous application (3). Several meta-analyses suggested a reduction in mortality and target-vessel revascularization with intracoronary abciximab (4–6). However, in the large, randomized AIDA STEMI (Abciximab Intracoronary versus intravenously Drug Application in STEMI) multicenter trial, intracoronary abciximab application did not result in a difference in major adverse cardiac events (MACE) compared with the standard intravenous route (7), but the rate of new congestive heart failure was significantly lower and there was an observed benefit in the female subgroup. Therefore, further analyses are warranted to assess potential benefits of intracoronary abciximab.

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Cardiac magnetic resonance (CMR) is uniquely suited to provide important mechanistic and pathophysiological information on infarct size, myocardial salvage, microvascular obstruction (MO), and intramyocardial hemorrhage (8–10). The aim of the predefined AIDA STEMI CMR multicenter substudy was to investigate potential benefits of intracoronary abciximab application on myocardial damage, reperfusion injury, and left ventricular (LV) function.

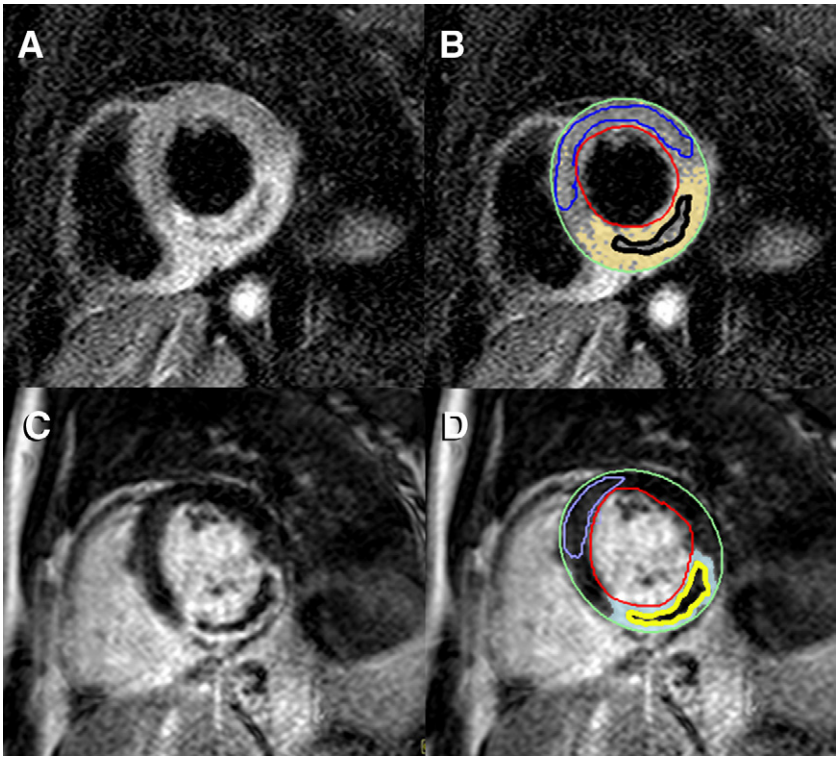

Figure 1 **Assessment of Myocardial Salvage, Infarct Size, Intramyocardial Hemorrhage, and Microvascular Obstruction**

(A) T2-weighted cardiac magnetic resonance image showing high signal intensity of the inferolateral segments (area at risk) with a hypointense core within the area of myocardial edema indicating intramyocardial hemorrhage. **(B)** Computer-aided signal intensity analysis of the T2-weighted image normalized to normal myocardium **(blue contour)**. The **yellow overlay** indicates a signal intensity of >2 SD above remote, uninjured myocardium. The **black contour** indicates the area of intramyocardial hemorrhage. **(C)** Contrast-enhanced image showing high signal intensity reflecting increased contrast accumulation in necrotic myocardium. **(D)** Computer-aided signal intensity analysis of the contrast-enhanced image: **light blue** indicates a signal intensity of >5 SD above remote, uninjured myocardium **(blue contour)**, whereas the **yellow contour** indicates the area of microvascular obstruction. The comparison of edema (area at risk) **(A, B)** with necrosis **(C, D)** shows no relevant myocardial salvage.

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