STEMI/NSTEMI

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TCT-57

Angiographic Reperfusion Indices Predict Infarct Size and Mortality: The INFUSE-AMI Trial

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Background: Optimal myocardial reperfusion in ST-elevation myocardial infarction (STEMI) is associated with lower mortality. Myocardial blush grade (MBG) quantifies extent of reperfusion but has not been extensively correlated with infarct size measured by MRI.
Methods: The INFUSE-AMI trial randomized patients with anterior STEMI due to proximal or mid LAD occlusion to intracoronary bolus abciximab delivered locally via the ClearWay RX catheter vs. no abciximab, and to manual thrombus aspiration with the Export catheter vs. no aspiration. The primary endpoint was core laboratory assessed MRI infarct size (IS, % of LV mass) at 30 days. Optimal MBG was defined as grade 2 or 3 assessed at a core laboratory blinded to randomization and outcomes.
Results: There were 452 patients randomized in the study. The median age was 61y, 74% were men and 11% had diabetes. Nearly 2/3 had proximal LAD involvement. Intracoronary abciximab reduced IS (% LV mass): 15.1[6.8-22.7] vs. 17.9[10.3-25.4], P=0.03. Thrombectomy had no effect on IS. Final MBG 2/3 was achieved in 81.4%. Final TIMI 3 flow was significantly more common, and cTFC and IS at 30 days were significantly lower in patients with final MBG 2/3 than in those with MBG 0/1 (Table). There was no significant difference in IS (% LV) between patients with MBG 2 and MBG 3 (17.5 [9.8, 25.1] vs. 16.2[6.7, 22.3], P=0.30). There was no difference in ST-segment resolution between patients with MBG 0/1 and 2/3 (Table). Total abnormal wall motion score at 30 days was lower in the MBG 2/3 patients (6.3±4.8 vs. 8.2±4.7, P=0.004) and ejection fraction was higher (mean 50.2% vs. 46.3%, P=0.003). At 30 days, death (1.7% vs. 8.3%, P=0.0008) was significantly lower in the MBG 2/3 group.
Conclusions: MBG determined immediately after primary PCI for STEMI is strongly associated with final MRI assessed infarct size (after infarct zone remodeling and shrinkage) and death at 30 days.

	MBG 0/1	MBG 2-3	P value
Final TIMI 3 flow, %	75	95.1	<0.0001
Corrected TIMI frame counts	42 [32,55]	34 [28,44]	0.0005
ST- resolution, mean, %	54.3	53.8	0.95
>70%, %	47.4	53.3	0.35
30%-70%, %	33.3	29.5	0.51
<30%, %	19.2	17.2	0.67
Infarct size at 30 days, % of LV mass	19.5 [11.1, 29.2]	16.7 [7.0, 22.7]	0.002

TCT-58

Effects of Mechanical Thrombectomy and Intracoronary Abciximab on Coronary Flow and Infarct Size During Primary PCI: Analysis from the INFUSE-AMI Trial

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Background: The INFUSE-AMI trial showed a significant reduction in infarct size at 30 days after intracoronary abciximab but not after mechanical thrombectomy, despite comparable myocardial blush grades and ST-segment resolution. Intra-procedural differences in coronary flow and thrombus removal may explain the results found.
Methods: INFUSE-AMI was a 2x2 factorial design trial in which 452 patients with STEMI and proximal or mid left anterior descending (LAD) coronary artery occlusion receiving bivalirudin anticoagulation were randomized to bolus intracoronary abciximab (A) via the ClearWay RX catheter vs. no abciximab, and to manual aspiration thrombectomy (T) with the Export catheter. TIMI flow, myocardial blush, and the presence of visible thrombus were studied before, during and after primary PCI in the 4 treatment groups.
Results: Both T and A improved TIMI flow and blush before stenting compared to neither intervention. Both also reduced the amount of visible thrombus before stenting (Table). However, after stenting these parameters were no longer significantly different among the four groups. Only T+A showed a significant reduction in infarct size, as % of LV mass measured by MRI compared all other groups (14.7[7.1, 20.6]% vs. 17.6[8.1, 25.1]%, P=0.03.
Conclusions: Both T and A are both individually effective in improving reperfusion and removing thrombus before stenting during primary PCI. Only the combination of the 2 treatments resulted in smaller infarct size, suggesting both pharmacological and mechanical thrombus modification in STEMI may be required to improve outcomes.

	T+A	T	A	Neither	p-value
TIMI 3 flow at baseline	13.6%	14.4%	17.1%	12.5%	0.79
TIMI flow 3 before stent	69.2%	76.8%	50.0%	27.1%	<0.0001
TIMI flow 3 after stent	90.7%	94.6%	91.9%	88.4%	0.42
Blush grade 2/3 at baseline	13.7%	15.3%	18.0%	17.1%	0.81
Blush grade 2/3 before stent	75.0%	79.8%	61.6%	38.5%	<0.0001
Blush grade 2/3 after stent	82.2%	84.7%	79.1%	79.5%	0.68
Thrombus at baseline	86.0%	85.6%	84.7%	89.3%	0.76
Thrombus before stent	45.4%	52.5%	59.0%	77.3%	0.0002
Thrombus after stent	0.8%	0.9%	2.7%	0.9%	0.54
Infarct size, %LV	14.7 [7.1, 20.6]	18.6 [12.5, 23.9]	17.3 [6.3, 24.6]	17.6 [9.7, 26.0]	0.12