TCT-467

Outcomes after Anterior ST-Elevation Myocardial Infarction According to LAD Lesion Location: The INFUSE-AMI Trial
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Background: Prognosis of ST-elevation myocardial infarction (STEMI) is determined predominantly by the extent of myocardial damage and hemodynamic status. Thus, in previous studies patients with proximal LAD occlusion have had worse outcome than those with more distal LAD lesions. It is not known whether modern reperfusion therapy has altered this relationship.

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 MI infarct size (IS, % LV mass) at 30 days. Lesion location was assessed at a core laboratory blinded to randomization and outcomes and was defined as proximal (pLAD) if present before or at first significant septal perforator branch, or mid (mLAD) if beyond it.

Results: The study enrolled 452 patients. The median age was 61y, 74% were men and 11% had diabetes. Intracoronary abciximab reduced IS (% LV mass): 15.6[8.7,22.7] vs. 17.9[10.3,25.4], P=0.03. Thrombectomy had no effect on IS. There were 292 (64.7%) patients with pLAD and 159 (35.3%) with mLAD occlusion. Patients with pLAD presented more often within 3h of symptom onset and had lower systolic blood pressure, but did not differ from mLAD patients with respect to heart rate, Killip class or extent of coronary disease. Thrombectomy was performed in 49.3% and 56.0% of the two groups, P=0.18 and intracoronary abciximab was used in 46.9% and 47.2%, respectively, P=0.79. Reprocedure success, infarct size and major clinical outcomes are listed in Table.

Conclusions: These data confirm the excess risk of death associated with pLAD infarcts even with contemporary reperfusion therapy. Reduced TIMI 3 flow rates and larger IS in pLAD infarcts translate into increased mortality.

TCT-468

Impact of Successful Thrombus Retrieval During Primary Percutaneous Coronary Intervention With Thrombus Aspiration on Infarct Size and Microvascular Obstruction: Insight From Contrast-Enhanced Magnetic Resonance Imaging
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Background: Thromboaspiration (TA) during primary percutaneous intervention (PCI) is effective in opening the infarct-related artery in patients with ST-segment elevation myocardial infarction (STEMI), leading to better reperfusion and improved outcome. However, the effect of positive macroscopic efficiency of TA remains unknown. We aimed to evaluate the impact of positive thrombus retrieval during PCI with manual TA on infarct size (IS) and microvascular obstruction (MVO) as assessed by contrast-enhanced magnetic resonance imaging (CE-MRI) in a subset of patients with STEMI.

Methods: Inclusion criteria were patients aged <75 years, with first STEMI referred for PCI within 12 hours of onset of symptoms, infarct-related artery ≥2.5 mm in diameter, thrombus score ≥3 and no prior history of coronary disease. All patients underwent TA before stenting and were categorized according to positive or negative TA. Clinical and procedural characteristics of study population were recorded and CE-MRI was performed at 5 days and 6-months to evaluate MVO and IS.

Results: 88 patients were enrolled, mean age 55±10 years; 43% in the positive TA group. Main results are presented in the table. Clinical and procedural characteristics (90-min total ischemic time, ST-segment resolution, post-procedural TIMI flow grade and post-stenting myocardial blush grade, and peak troponin) did not differ significantly between groups. Independent predictors of final IS were: positive TA (OR 0.34, 95%CI 0.03-0.71), MVO (OR 1.75, 95%CI 1.28-2.71) and RI at 5 days (OR 2.06, 95%CI 1.87-3.32).

Conclusions: Positive thrombus retrieval during primary PCI with manual TA in STEMI reduces MVO and in the acute phase and at 6 months and represents a powerful predictor of final infarct size.

TCT-469

Frecuency, Timing and Implications of Reinfarction after Primary Stenting in ST-Segment Elevation Myocardial Infarction: The HORIZONS-AMI trial
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Background: In early studies, reinfarction after primary angioplasty occurred relatively frequently and was an important cause of mortality in STEMI. The frequency, timing and implications of reinfarction in the contemporary primary PCI era have not been described.

Methods: In HORIZONS-AMI, 3,602 pts with STEMI at 123 sites were randomized to heparin + glycoprotein IIb/IIIa inhibitor (GPI) vs. bivalirudin, and to paclitaxel-eluting stents vs. bare metal stents (BMS). Clinical FU was conducted for 3 years.

Results: Stents were implanted in 3,202 pts, comprising the current study cohort. Reinfarction within 3 years occurred in 221 pts (6.9%) at median [IQR] 244 [22, 573] days. Reinfarction developed within 30 days in 59 pts (27.0%); thereafter the incidence rate of reinfarction was linear and constant until 3 years, with no plateau evident. Of note, definite stent thrombosis was responsible for 115 of the 221 reinfarctions (52.0%). The unadjusted 3-year reinfarction rate was lower in pts assigned to bivalirudin vs. heparin + GPI (6.5% vs. 8.3%, p=0.04), but was not different with DES vs. BMS (7.0% vs. 8.1%, p=0.31). By multivariable analysis, independent predictors of reinfarction were current smoking (P=0.009), Killin class ≥1 (P=0.001), stent length (P=0.006), platelet count (P=0.003), symptom to balloon time (P=0.02), multivessel disease (P=0.0004) and prior MI (P=0.0001). At 3 years, pts with vs without reinfarction had higher unadjusted rates of cardiac death (9.8% vs. 3.2%, P=0.001) and all-cause mortality (13.1% vs. 5.8%, P<0.0001). In a time and covariate adjusted Cox multivariable model, reinfarction was an independent predictor of 3-year cardiac death (HR[95%CI] = 8.39 [47, 14.77], P<0.0001) and all-cause mortality (HR[95%CI] = 3.25 [1.98, 5.35], P<0.0001).

Conclusions: Despite improvements in drugs and devices, reinfarction after primary PCI still occurs relatively frequently with both BMS and DES; is often due to stent thrombosis; and is strongly associated with subsequent cardiac death and all-cause mortality. Safer stents and more effective antithrombotic agents are required to prevent reinfarction and further improve outcomes in STEMI.

TCT-470

Manual Thrombectomy during Primary Percutaneous Coronary Intervention Can Preserve the Index of Microcirculatory Resistance in Patients with Anterior ST-Segment Elevation Myocardial Infarction
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Background: Despite recovered normal epicardial coronary flow after primary percutaneous coronary intervention (PCI) for ST-segment elevation myocardial infarction (STEMI), microvascular damage and dysfunction limit the effect of primary PCI. The purpose of this study was to evaluate whether manual thrombectomy can preserve the index of microcirculatory resistance (IMR) after primary PCI in patients with anterior STEMI.