TCT-349

Predictive Value of the Syntax Score for the Occurrence of Periprocedural Myocardial Infarction in the TWENTE Trial

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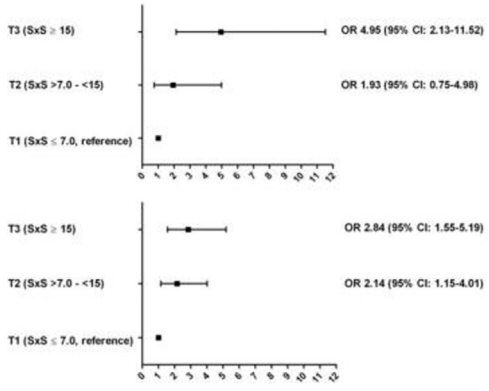
Background: The Syntax Score (SxS) is a scoring system for the complexity of atherosclerotic disease burden in the coronary arteries. We investigated the predictive value of the SxS for the occurrence of a periprocedural myocardial infarction (PMI) according to the WHO definition and recently updated third universal definition of MI.
Methods: The SxS was calculated in 1,243 patients enrolled in TWENTE, a randomised trial in a real-world patient population treated with second-generation drug-eluting stents. In all patients, cardiac biomarkers and electrocardiograms were systematically assessed. PMI (i.e. an MI within 48 hours after PCI) was defined by the extended historical WHO definition and the third universal definition of MI.
Results: Patients were stratified in tertiles of SxS ≥15 (n=423), >7 and <15 (n=390), and <=7 (n=430). PMI according to the WHO definition occurred more frequently in patients of the highest SxS tertile group than in other tertile groups (7.3% vs. 3.1% vs. 1.6%, p<0.001). Similar findings were also seen for PMI according to the universal definition (9.9% vs. 7.7% vs. 3.7%, p<0.01). The SxS was a significant independent predictor of PMI according to both historical (adjusted OR 1.07, 95% CI: 1.04-1.10, p<0.001) and universal definition (adjusted OR 1.04, 95% CI: 1.01-1.06 p<0.001). In addition, 2-year all-cause mortality differed between SxS tertile groups (6.6% vs. 4.1% vs. 1.4%; p=0.001).
Conclusions: In a real world patient population treated with second-generation drug-eluting stents, the Syntax Score was able to stratify risk for the occurrence of peri-procedural MI and all-cause mortality.



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Long term effect of sodium bicarbonate plus N-acetylcysteine in the setting of urgent PCI for STEMI

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Background: Contrast-induced nephropathy (CIN) represents a harmful complication of percutaneous coronary interventions (PCI) in the setting of ST-elevation myocardial infarction (STEMI),and its occurrence is associated with an increased incidence of Major Adverse Cardio-Cerebrovascular Events (MACCE).Several strategies of nephroprotection have been demonstrated to be effective in reducing the incidence of CIN in the acute setting,but no study has documented a long-term benefit in terms of reduced MACCE.Our aim was to demonstrate the efficacy of a strategy of hydration with sodium bicarbonate (SB) in addition to high-dose N-acetylcysteine (NAC) in the setting of urgent PCI for STEMI in reducing the incidence of long-term MACCE.
Methods: From June 2009 to September 2010,262 consecutive STEMI patients undergoing urgent PCI were prospectively enrolled and treated by SB-based hydration (154 mEq/L at 3 ml Kg-1 for 1 hour followed by 1 ml Kg-1 for 6 hours) (Group A).As controls,262 consecutive STEMI patients receiving 0.9% saline hydration (1 ml Kg-1 for 24 hours) before June 2009 were retrospectively enrolled (Group B).Both groups received high-dose NAC. CIN was defined as a ≥ 25% increase in serum creatinine at 48 hours.Primary composite endpoint at follow up (maximum 48, mean 22 ±20 months) was the incidence of MACCE expressed as the occurrence of death/myocardial infarction/stroke/need for revascularization.
Results: At baseline groups were comparable for clinical and procedural characteristics.The incidence of CIN was significantly reduced in group A as compared to group B (8.0 vs 14.1%, p=0.03, NNT 17).Primary combined end point at follow up was significantly reduced in group A as compared to group B (HR 0.65, C.I. 0.43-0.98; p=0.04 at Log Rank analysis).Similarly,SB-based hydration reduced also the following secondary endpoints: death/myocardial infarction/need for revascularization (HR 0.66 C.I. 0.44-0.99 p=0.04),death/myocardial infarction (HR 0.48 C.I. 0.26-0.90; p=0.02),death (0.46 C.I. 0.22-0.95; p=0.04).
Conclusions: SB hydration in addition to high-dose NAC in the setting of urgent PCI for STEMI reduces the long term rate of MACCE by a significant decrease in the rate of in-hospital CIN.

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Predictors of Contrast Induced Nephropathy in Patients with Chronic Kidney Disease after Percutaneous Coronary Intervention

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Background: Contrast-induced nephropathy (CIN), which is difficult to predict the occurrence, is a fatal complication in patients undergoing percutaneous coronary intervention (PCI). The aim of this study was to investigate the major predictors of CIN in those with chronic kidney disease (CKD) after coronary revascularization.
Methods: We enrolled consecutive 281 patients with CKD who had undergone PCI and retrospectively collected clinical, laboratory and angiographic data. CIN was defined as an increase in serum creatinine >25% or a decrease in the estimated glomerular filtration rate (eGFR) <25% from baseline in post procedural first 72 hours.
Results: Among all participants, CIN occurred in 50 (18%) patients. MI (54.0% vs. 29.9%, p=0.002) and shock (16.0% vs. 6.5%, p=0.042) were common in CIN patients than those without CIN. The patients who developed CIN had significantly higher V/CrCl (8.8 ± 8.7 vs. 5.8 ± 4.5, p=0.025) and lower eGFR (33.2 ± 15.6 vs. 39.9 ± 13.4, p=0.006) than those without CIN. Age, gender, the type of contrast media, LV EF, and the number of inserted stent were no significant differences between the two groups. CIN patients had a greater multivessel disease (88.0% vs. 72.7%, p=0.029) and disease of left main coronary artery (18.0% vs. 6.5%, p=0.021) than those without CIN. From the ROC curve analysis, the cutoff value of V/CrCl ratio to predict CIN was 6.0 (AUC=0.610, p=0.014). In multivariate logistic regression analyses, the development of CIN was strongly associated with female gender (adjusted HR 2.2: 1.1-4.6, p=0.028), MI (adjusted HR 2.8: 1.4-5.8, p=0.005), PCI for left main disease (adjusted HR 4.2: 1.5-11.8, p=0.008), and V/CrCl ≥6.0 (adjusted HR 3.8: 1.8-7.8, p<0.001) after adjusted for clinically and statistically important covariates.
Conclusions: Female gender, MI, PCI for left main disease, and V/CrCl ratio≥ 6.0 were major predictors of CIN in CKD patients undergoing PCI.

Table 1. Univariate and multivariate analysis of determinants of CIN in CKD patients after percutaneous coronary intervention

	Univariate analysis	Multivariate analysis			
	p value	β Coefficient	p value	Exp (B)	95% CI
Age ≥75	0.636	-0.345	0.349	0.7	0.3-1.5
Female gender	0.132	0.802	0.028	2.2	1.1-4.6
MI	0.002	1.036	0.005	2.8	1.4-5.8
DM	0.233	0.107	0.793	1.1	0.5-2.5
Type of contrast	0.641	0.190	0.595	1.2	0.6-2.4
V/CrCl ≥6.0	0.002	1.331	<0.001	3.8	1.8-7.8
Number of inserted stent (≥2)	0.753	-0.089	0.805	0.9	0.5-1.9
Shock	0.042	0.564	0.318	1.8	0.6-5.3
PCI for LM	0.012	1.424	0.008	4.2	1.5-11.8

MI = myocardial infarction; DM = diabetes; V/CrCl = the ratio of the contrast media volume to the creatinine clearance; PCI = percutaneous coronary intervention; LM = disease of left main coronary artery

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Prognostic value of acute kidney injury immediately after primary percutaneous coronary intervention in patients with ST segment elevation myocardial infarction

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Background: The pattern and prognostic impact of acute kidney injury (AKI) immediately after primary percutaneous coronary intervention (PCI) in patients with ST segment elevation myocardial infarction (MI) has not been well established.

Methods: Between November 2005 and November 2011, 971 eligible patients (712 men; mean age = 62.8±12.2 year-old) were analyzed in this study. AKI was defined using absolute change in serum creatinine (SCr; SCr within 24-hour after primary PCI minus admission SCr), AKI was categorized as no AKI (SCr change, <0.3mg/dL), mild AKI (SCr change, 0.3-<0.5 mg/dL), moderate AKI (SCr change, 0.5-<1.0 mg/dL), and severe AKI (SCr change, ≥1.0mg/dL). The 12-month major adverse cardiac events (MACEs) were defined as death, recurrent MI, and revascularizations.
Results: Overall, 9.6% had AKI by SCr including 5.7% with mild AKI, 2.5% with moderate AKI, and 1.4% with severe AKI. The patients with AKI were more likely to be female, and had a higher Killip class, more often diabetics, lower left ventricular ejection fraction, lower hemoglobin levels, and higher N-terminal pro-brain natriuretic peptide levels (NT-proBNP). During the 12-month follow-up, 9.3% (n=96) MACE occurred. The 12-month MACEs for those with mild, moderate, and severe AKI were 25.0%, 40.9%, and 70.0% compared with 8.6% in those without AKI. Kaplan-Meier survival curve showed that there was significant difference in 12-month MACEs according to the severity of AKI (log-rank p <0.001). The patients with AKI had a significantly higher 12-month MACEs compared with those without AKI (30.1% versus 7.0%, p <0.001). In Cox proportional hazards model, presence of AKI (hazard ratio [HR] 2.803, 95% confidence interval [CI] 1.359–5.782; p=0.005) in addition to Killip class >2 (HR 1.913, 95%CI 1.023–3.580; p=0.042), serum glucose levels (HR 1.005, 95%CI 1.002–1.007; p<0.001), and log-transformed NT-proBNP levels (HR 1.205, 95%CI 1.031–1.409; p=0.019) was an independent predictor of 12-month MACEs after adjusting for confounding variables.
Conclusions: The AKI immediately after primary PCI is common and associated with poor prognosis, particularly in post-MI patients with heart failure. Further efforts are required in these patients.

TCT-353

Long-term Clinical Outcomes in Patients with Renal Insufficiency After Sirolimus-eluting Stent Implantation: Five-year Follow-up Results of the J-Cypher Registry

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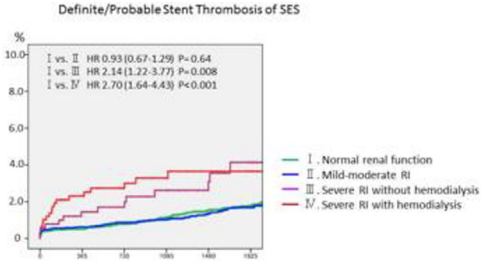
Background: We sought to evaluate the impact of baseline renal function on clinical outcomes in sirolimus-eluting stent (SES) recipients in the real-world registry.
Methods: The design of the j-Cypher Registry was a multicenter prospective enrollment of consecutive patients who underwent SES implantations from 41 centers in Japan. We reviewed 5-year clinical outcomes of 10 775 patients who had undergone SES implantation exclusively and successfully between August 2004 and December 2006. The patients were stratified into 4 groups according to their estimated glomerular filtration rate (eGFR): Group I, eGFR ≥60 ml/min/1.73m2 (normal renal function); Group II, eGFR <60 and ≥30 ml/min/1.73m2 (mild-moderate renal insufficiency [RI]); Group III, eGFR <30 ml/min/1.73m2 and not on hemodialysis (HD) (severe RI without HD); and Group IV, renal failure treated with HD (severe RI with HD).
Results: The rate of all-cause death increased with the deterioration in renal function. For all-cause death, hazard ratio (HR) and 95% confidence interval (95%CI) were as follows: I vs. II, HR 2.16, 95%CI 1.89-2.47, p<0.001; I vs. III, HR 7.02, 95%CI 5.85-8.42, p<0.001; I vs. IV, HR 10.71, 95%CI 9.15-12.53, p<0.001. The TLR rates of non-severe RI groups were low and similar: I vs. II, HR 0.92, 95%CI 0.82-1.03, p=0.16; I vs. III, HR 1.27, 95%CI 0.99-1.63, p=0.06; I vs. IV, HR 3.58, 95%CI 3.04-4.22, p<0.001. The rates of stent thrombosis are shown in the figure.
Conclusions: The effect of RI on coronary intervention results with SES is heterogeneous in each clinical event.



TCT-354

Utility Of The National Cardiovascular Data Registry (NCDR) Risk Score In A Veterans Affairs (VA) Hospital To Predict 3 Year Mortality

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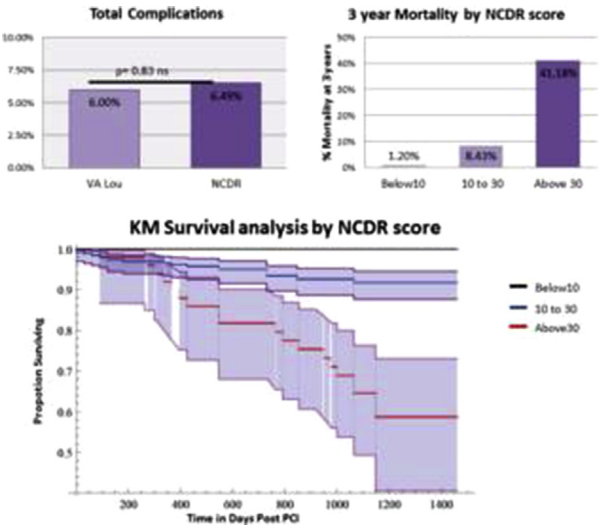
Background: We report outcomes of PCIs done without onsite cardiac surgery and compare them to contemporary outcomes using the National Cardiovascular Data Registry (NCDR) database. The NCDR Risk score is a useful tool to predict the risk of in-patient mortality after PCI. We wanted to evaluate if this score is applicable to a VA population and assess its use in predicting outcomes.
Methods: Major complications from the 400 cases(365 retrospective) were compared to contemporary data from published NCDR database. NCDR risk scores were calculated for all the patients and these were co-related with their outcomes. Kaplan Meier (KM) Survival Analyses of low (<10), intermediate (10 to 30) and high (>30) NCDR score patients was performed with 3 year mortality data.
Results: The patients were predominantly older males with multiple risk factors. There were no in-patient deaths and only 1 patient required emergent CABG and overall complication rates were similar to NCDR. Only 1 of the 83 (1.2%) patients with a NCDR score <10 died while 21 of the 52 (40.4%) with a score >30 died within 3 years. KM survival analyses of patients were stratified by NCDR score confirmed significant increase in the 3 year mortality of the patients with higher scores. This is the first report using the NCDR score in a VA population.



Conclusions: PCI outcomes at the VA Louisville without onsite surgery are comparable to NCDR. The NCDR score provides a convenient and efficient way of predicting long term outcomes after PCI in the VA and can assist improved resource utilization within VA for PCI.

TCT-355

The Risk of Kidney Injury With Coronary Artery Bypass Grafting Compared With Percutaneous Coronary Intervention

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Background: Reliable evaluation of absolute and relative risk of kidney injury after coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI) are unavailable. Therefore, we evaluated the risk of kidney injury after coronary artery bypass grafting (CABG) as compared with that after percutaneous coronary intervention (PCI) in patients with multivessel coronary artery disease.
Methods: Using a cohort from the ASAN-multivessel registry, we analyzed a total of 5095 patients with multivessel coronary artery disease: 2473 patients had PCI and 2622 patients had CABG. We used propensity-score matching to compare the rates of the primary endpoint (death from any causes or chronic dialysis) at 5 year. After propensity-score matching, there were 1717 matched pairs of patients, and with no significant differences were present between the two groups for any of the covariates.
Results: During the hospitalization for index procedure, CABG group has higher incidence of acute kidney injury stage 2 or 3 (0.7% vs. 4.7%, P<0.001). At long-term, serum creatinine level (1.13±0.88mg/dL vs. 1.14±0.79mg/dL, P=0.76) was not different, but estimated glomerular filtration rate was significantly lower in CABG group (68.2±23.3 vs. 73.3±23.2, P<0.001). Regarding clinical outcomes, the risk of the primary end point at 5 years was significantly lower in PCI group than CABG group (hazard ratio [HR], 0.55; 95% confidence interval [CI], 0.43–0.70, P<0.001). The risk of any dialysis was also lower in PCI group (HR 0.59; 95% CI 0.35-0.99, P=0.044), mainly due to the lower risk of temporary dialysis (HR 0.27; 95% CI 0.10-0.73, P=0.01) but not due to the risk of chronic dialysis (HR 0.27; 95% CI 0.10-0.73, P=0.01) between two revascularization treatment.