Comparison of PCI Procedure and Outcomes in Patients With Myocardial Strain Abnormalities (Differences in TIMI Risk Score)

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Background: TIMI Risk score for STEMI is a convenient, bedside, clinical score for risk stratification. However, it is not well known the difference between PCI procedure. The purpose of this study was to assess the PCI procedure and outcomes in patients with STEMI whether there is a difference in three TIMI Risk Score groups: low risk (0–4points), intermediate risk (5–7points) and high risk (8points and over).

Methods: From April 2007 to March 2013, we analyzed total 400 patients with STEMI expect for cases of cardiopulmonary arrest on arrival and surgical treatment, stent thrombosis, in hospital case.

Results: Complex culprit lesion rates case had more high risk group such as ostial lesion (low 5.6% vs. intermediate 5.6% vs. high 19.3%, p=0.0004), bifurcation lesion (low 8.5% vs. intermediate 14.9% vs. high 18.1%, p=0.05), left main lesion (low 0% vs. intermediate 1.4% vs. high 9.6%, p<0.0001), usage of intra aortic balloon pump (IABP) (low 9.6% vs. intermediate 11.3% vs. high 38.5%, p<0.0001). In-hospital mortality was high rate in high risk group (low 1.2% vs. intermediate 4.9% vs. high 16.8%, p<0.0001). There was a statistically significant difference in survival between all risk groups in 30-days and one-year follow-up (Log rank p<0.0001). Outcome rates at 2 year follow up for TLR free MACCE (All cause death, myocardial infarction, stroke, target lesion revascularization) Kaplan-Meier methods were low 7.2% vs. intermediate 17.5% vs. high 29.5% (Log rank p<0.0001).

Conclusion: The higher TIMI risk score, the rate of complex lesions such as LMCA, bifurcation and ostial is higher and prognosis is poor.

Impact of Different Subtypes of Microvascular Dysfunction on Myocardial Strains in ST-segment Elevation Myocardial Infarction Patients Treated With Reperfusion Therapy

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Background: Presence of microvascular dysfunction (MD) has been regarded as a key prognostic factor for ST-segment elevation myocardial infarction (STEMI) patients who received reperfusion therapy. Cardiac Magnetic Resonance Imaging (CMR) can differentiate subtypes of MD, i.e. solo microvascular obstruction (MVO) or MVO with intramyocardial hemorhage (IMH), which theoretically have different effects on myocardial movements in infarction zone. This study aimed to disclose the relationship between subtypes of MD and changes of myocardial strain in reperfused STEMI patients.

Methods: Sixty-three STEMI patients who received primary percutaneous coronary intervention within 12 hours form the basis of this study. MD and its subtypes were defined by CMR using T2-weighted and late-gadolinium-enhancement imaging technologies within 1 week after STEMI onset for each patient. Myocardial strains were measured on the same day of the CMR examination by 2D speckle-tracking echocardiography (2DSTE), where peak systolic segmental circumferential (CS), radial (RS), and longitudinal (LS) strains were calculated, respectively.

Results: A total of 1134 segments were measured by 2DSTE. An infarction necrosis with more than 50% transmural percentage caused significant decreasing of myocardial strain compared to normal myocardium in all three dimensions (CS: 10.16±20.15 vs. 20.15±7.50; RS:18.52±13.88 vs. 39.07±2.54; LS:7.67±7.27 v.s 17.10±6.57, p<0.001 in all comparisons). The existence of solo MVO had a trend to further decrease the strains circumferentially and longitudinally compared to necrotic segments without MD (CS: 7.99±7.21 v.s 10.16±20.15; LS: 5.81±7.67 v.s 7.67±7.27, both p<0.05). However, when MVO was accompanied with IMH, the deterioration of the strains became significantly worse in this two dimensions (CS 4.29±1.96 v.s 10.16±20.15; LS 4.12±1.66 v.s 7.67±7.27, both p<0.001).

Conclusion: The existence of MD, especially IMH can cause remarkably exacerbation of the myocardial movement on the basis of the infarction, which can explain the worse prognosis in this subgroup of patients as observed by former studies.

Prognostic Factors Associated With Ischemic Preconditioning in Patients Presenting with Acute Myocardial Infarction: Results from a Tunisian Registry

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Background: When occurring before a myocardial infarction, ischemic preconditioning is associated with lesser infarct size in animals. In humans, prognostic significance of ischemic episodes preceding acute myocardial infarction (AMI) is not well understood. We sought to study prognostic features associated with ischemic preconditioning in patients admitted for AMI.

Methods: We retrospectively reviewed data from a Tunisian registry including 1386 patients hospitalized in our center for AMI between January 1998 and January 2012 and discharged either by thrombolysis, primary percutaneous coronary intervention or conservative therapy. The overall population was divided into Preconditioning Group and Inaugural Group according to the occurrence of symptomatic ischemic episodes in the 24 hours preceding the AMI or not. Population characteristics and prognostic features were compared in the two groups.

Results: Out of the study population, 383 (27.6%) patients were part of the Preconditioning Group. Compared with the patients in the Inaugural Group, patients in the Preconditioning Group had more frequently arterial hypertension (35.2% vs. 28%, p=0.011), diabetes mellitus (40.5% vs. 33.5%, p=0.012) and a history of coronary artery disease (CAD) (18.3% vs. 8%, p<0.0001). The recourse to inotropic agents for low output was significantly lower in the Preconditioning Group (13.3% vs. 15.2%, p=0.015) and in-hospital mortality was lower compared to that in the Inaugural Group (1.2% vs. 10.1%, p=0.028). No significant difference could be identified between the two groups regarding age, gender, occurrence of ventricular arrhythmias and angina recurrence. In multivariate analysis, features independently associated with ischemic preconditioning were a history of CAD (HR: 2.38, 95% CI: 1.66-3.33, p<0.0001) and diabetes mellitus (HR: 1.34, 95% CI: 1.04-1.71, p=0.021).

The absence of ischemic preconditioning was independently associated to in-hospital death (HR: 0.52, 95% CI: 0.3-0.9, p=0.02).

Conclusion: In our study, ischemic preconditioning is independently related to dia- betes and a history of CAD. The absence of ischemic preconditioning is independently related to in-hospital death in patients admitted for AMI.

A New Risk Score to Predict Bleeding Events in ST Elevation Myocardial Infarction Patients Underwent Primary Percutaneous Coronary Intervention

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Background: Acute Coronary Syndrome with ST-Elevation Myocardial Infarction (STEMI) has high mortality rate, and it is greatly increased when bleeding events occur. Standard management of STEMI also increase the possibility of bleeding. Early identification of patients with high risk of bleeding is important for optimization of STEMI care.

Methods: A retrospective cohort study, done in National Cardiovascular Center Harapan Kita, Indonesia in STEMI patients underwent primary PCI. Bleeding event was defined with definition from Bleeding Academic Research Consortium (BARC). Risk score was created by assignment of variables that included in the final model according to their Odds Ratio (OR) values.

Results: 579 samples fit the inclusion and exclusion criteria. Bleeding events occurred in 42 patients (7.3%). The complete variables included are: Female gender, Killip class 3/4, age ≥ 62 y.o, white blood cell ≥12.000, creatinine ≥1.5, body mass index ≥ 25, multiple coronary lesion, femoral access, and temporary pace maker (TPM) implantation. These variables are converted into two types of scoring system: the complete and the alternative model. Complete model contains all of the variables, and alternative model discards variables related to interventional procedures for early stratification before pci. Area under the ROC curves are 0.82 and 0.84, respectively. For each scoring system, four categories (low, moderate, high, and very high) were made according to increased bleeding probability.

Conclusion: A new scoring system quantifies risk for in-hospital bleeding events in STEMI patients undergoing primary PCI, which might be able to enhance baseline risk assessment for STEMI care.

Role of Coronary Collateral Circulation in Myocardial Infarct Size in ST-segment Elevation Myocardial Infarction Patients Underwent Primary Percutaneous Coronary Intervention

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Background: Primary percutaneous coronary intervention (PCI) conducted immediately by an expert operator is a primary reperfusion strategy in acute ST-segment elevation myocardial infarction (STEMI) patient. Although fully aware of the importance of early diagnosis and reperfusion in patients with STEMI, time delays are...