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The Impact of Weekend and Holiday Versus Weekday Presentation on the Reperfusion Therapy and Clinical Outcomes in Acute Myocardial Infarction Patients

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Background: The aim of this study is to compare clinical outcomes among patients visited hospital with acute myocardial infarction on weekends and holiday during absence of available emergency procedure staff, and those visited on weekdays during working time when available practitioners stay in hospital.
Methods: A total of 13,582 patients diagnosed as AMI from Korean Acute Myocardial Infarction Registry were enrolled in this study. The patients were divided into 3 groups; Patients visited hospital on day time (8am to 6pm) of weekdays (group 1, n=6007), on night time (6pm to 8am) of weekdays (group2, n=3744), on weekend or holiday (group 3, n=3831). Primary end-point was in-hospital mortality. Secondary end-point was major adverse cardiac events (MACE) at one year.
Results: Patient visited hospital on weekends were less likely to undergo invasive cardiac procedures than those were admitted on weekdays (In STEMI patients, primary PCI was done 78.5% of Group1 vs. 73.1% of group2 vs. 69.1% of group3, p<0.001. In NSTEMI patients, early invasive therapy was done in 49.5% of Group 1 vs. 48.5% of Group2 vs. 40.7% of Group 3, p=0.000). In-hospital mortality was observed as 4.9% in Group 1 and 5.3% in Group 2 and 6.0% in Group 3 (p=0.055). On comparison with group of patients visited on day time of weekdays and those on night time of weekday, in-hospital mortality was not different (4.9% vs. 5.3%, p=0.319). On comparison with night time on weekdays and weekend or holiday, in-hospital mortality also was not different (5.3% vs. 6.0%, p=0.212). However compared to group of patients visited hospital on day time of weekday, patients visited on weekend or holiday group had higher in-hospital mortality (4.9% vs. 6.0%, p=0.016). MACE for one year occurred 1883 patients (17.2% of group 1 vs 18.5% of group 2, 19.2% of group3, p=0.081).
Conclusions: The patients visited hospital on weekend and holiday presented with AMI had worse clinical outcome than those visited on weekday. However it was not different between nighttime of weekdays and weekend.

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Impact of hyperglycemia on myocardium at risk and salvage in patients with ST elevation myocardial infarction and the association with exenatide treatment

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Background: Hyperglycemia upon admission in patients with ST-segment myocardial infarction (STEMI) is associated with larger infarct size and adverse prognosis. However, the association of hyperglycemia with area at risk and myocardial salvage has been insufficient studied. Also, exenatide, a glucagon-like-peptide analogue that is known to increase the cellular glucose uptake and reduce the level of blood glucose, has demonstrated to be cardioprotective in STEMI patients undergoing primary percutaneous coronary intervention (PCI). Thus, the aim of this study was to evaluate the association of hyperglycemia with area at risk and salvage index in STEMI patients treated with primary PCI, and assess the interaction between glycemic state and cardioprotective effect of exenatide.
Methods: In this post-hoc study 210 STEMI patients randomized to exenatide or placebo were stratified on the basis of diabetes status and glucose level upon admission. Cardiovascular magnetic resonance was used to measure area at risk and final infarct size.
Results: One-hundred-and-twenty-five (60%) patients had normoglycemia and 85 (40%) hyperglycemia. Patients with hyperglycemia had larger area at risk (33±11 % of left ventricle (LV) versus 30±11 %LV; p=0.027) and final infarct size (12±7 %LV versus 9±6 %LV; p=0.024) than patients with normoglycemia The salvage index did not differ between the groups (0.72±0.15 versus 0.71±0.13; p=0.75), and the infarct size was not different adjusting for area at risk (p=0.54). Among patients with normoglycemia treatment with exenatide resulted in increased salvage index of 10% compared to placebo (p=0.08), and 14% among patients with hyperglycemia (p=0.017), but there was no interaction (p=0.71).
Conclusions: The presence of hyperglycemia upon admission in STEMI patients is related to a larger final infarct size, which can be explained by an equally larger area at risk, but not by a reduction in myocardial salvage index. Also, the cardioprotective effect of exenatide treatment is independent of glucose level upon admission.

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Clinical Profile And Impact Of A Family History Of Premature Coronary Artery Disease On Long-term Clinical Ischemic Events In Patients Undergoing PCI For STEMI: Analysis From The HORIZONS-AMI Trial. Revascularization And Stents In Acute Myocardial Infarction) Trial.

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Background: Family history of premature coronary artery disease (FHC) is a well-known risk factor for the occurrence of CAD. Despite this fact, the clinical profile and prognosis of patients with FHC presenting with STEMI undergoing primary percutaneous coronary intervention (PCI) is unknown.
Methods: A total of 3602 pts presenting with STEMI in the HORIZONS-AMI trial underwent PCI. Angiographic and ischemic clinical outcomes were assessed at 30 days and 3 years according to FHC.
Results: FHC was present in 1059/3601 pts (29.4%). Pts with FHC were more likely to be younger (56.7 years vs. 62.1 years, p<0.0001), current smoker (52.4% vs. 43.5%, p<0.0001), have dyslipidemia (47.7% vs. 41.1%, p=0.0003), were less likely to have diabetes (14.1% vs. 17.5%, p=0.01) or peripheral vascular disease (3.1% vs. 5.0%, p=0.01), and had shorter time for symptoms to presentation time (100 minutes vs. 120 minutes, p=0.002). There was no difference in the severity of extend of CAD at baseline according to FHC. Pts with FHC had better angiographic results after PCI, with higher rates of TIMI 3 flow (93.8% vs. 90.6%, p=0.002), myocardial blush grade 2 or 3 (83.2% vs. 78.0% p=0.0008), less slow reflow (0.8% vs. 2.1%, p=0.006) and abrupt closure (0.1% vs. 0.6%, p=0.05). The unadjusted 30-day and 3-year mortality rates were lower in pts with FHC compared to no FHC (1.8% vs. 3.0%, p=0.046 and 4.8% vs. 7.7%, p=0.002, respectively), while other ischemic endpoints were similar between the two groups. By multivariable analysis, the presence of FHC was not an independent predictor of death at 3 years (HR [95%C] = 0.87 [0.60, 1.25], p=0.45).
Conclusions: Patients with STEMI in whom FHC was present were younger and (surprisingly) more often smokers. Despite better acute angiographic results after PCI in patients with compared to without PCI, the presence of FHC was not an independent predictor of long-term death or event-free survival.

	Family History of CAD (N=1059)	No Family History of CAD (N=2542)	Relative Risk [95% CI]	p value
30-day event				
MACE	48 (4.5%)	151 (6.0%)	0.76 [0.55,1.05]	0.09
Death	19 (1.8%)	75 (3.0%)	0.60 [0.36,1.00]	0.046
Cardiac	17 (1.6%)	68 (2.7%)	0.60 [0.35,1.01]	0.05
Reinfarction	15 (1.4%)	51 (2.0%)	0.70 [0.39,1.24]	0.22
Ischemia-driven TVR	26 (2.5%)	59 (2.3%)	1.05 [0.66,1.67]	0.82
Ischemia-driven TLR	26 (2.5%)	53 (2.1%)	1.17 [0.73,1.88]	0.50
Definite or probable stent thrombosis	20 (2.1%)	56 (2.5%)	0.84 [0.50,1.39]	0.49
3-year event				
MACE	210 (20.6%)	547 (22.5%)	0.90 [0.77,1.05]	0.18
Death	49 (4.8%)	188 (7.7%)	0.61 [0.45,0.84]	0.002
Cardiac	27 (2.6%)	112 (4.6%)	0.57 [0.37,0.87]	0.008
Reinfarction	67 (6.7%)	173 (7.4%)	0.90 [0.68,1.20]	0.48
Ischemia-driven TVR	140 (14.0%)	320 (13.7%)	1.02 [0.84,1.25]	0.84
Ischemia-driven TLR	107 (10.7%)	257 (11.0%)	0.97 [0.78,1.22]	0.81
Definite or probable stent thrombosis	48 (5.2%)	108 (5.0%)	1.03 [0.73,1.45]	0.87

Value are presented as n (%); CAD=coronary artery disease; MACE=major adverse cardiac event; CI=confidence interval; TVR=target vessel revascularization; TLR=target lesion revascularization.

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Effect of Thrombus Burden and its Residue on No-reflow Phenomenon After Manual Thrombectomy in ST-elevation Myocardial Infarction Patients

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Background: Large thrombotic burden is a well-known predictor of no-reflow phenomenon and mortality in ST-elevation myocardial infarction (STEMI). However, limited data are available on the clinical significance of residual thrombus after thrombectomy. Therefore, we aimed to investigate the effectiveness of manual thrombectomy in decreasing thrombus burden, and the effect of residual thrombus on myocardial perfusion after thrombectomy.
Methods: A multicenter, randomized, prospective trial including 479 acute myocardial infarction (MI) patients was conducted to compare the efficacy and safety of the everolimus- and zotarolimus-eluting stents for coronary lesions. After excluding 197 non-STEMI patients, 283 STEMI patients undergoing primary percutaneous intervention (PCI) were studied. The no-reflow phenomenon incidence after primary PCI was compared between the small thrombus burden (n=138) and large thrombus burden (n=145) groups, defined by a thrombus score of $\geq$3. Aspiration thrombectomy was performed in 71 large thrombus group patients (49%), and the no-reflow incidence in this group was compared based on thrombectomy treatment and pre-stenting residual thrombus. No-reflow phenomenon was defined by a final TIMI flow grade of $\leq$2 or myocardial blush grade of $\leq$1.
Results: No-reflow phenomenon occurred frequently in the large thrombus burden patients without thrombectomy, followed by those who underwent thrombectomy, and the small thrombus burden group (33.8% vs. 18.9% vs. 10.1%, p<0.001). Fifteen patients with pre-stenting residual thrombus had a higher no-reflow incidence than those without visible pre-stenting thrombus (66.7% vs. 15.7%, p<0.001). Multilogistic analysis revealed a baseline TIMI flow grade of $\leq$1 (odds ratio [OR] 2.929, confidence interval [CI] 1.064–8.062), Killip class 2 or 3 (OR 2.452, CI 1.100–5.466), pre-stenting residual thrombus (OR 7.997, CI 2.186–29.253), and distal embolization (OR 3.859, CI 1.252–11.893) were independent no-reflow phenomenon predictors.
Conclusions: Aspiration thrombectomy substantially reduces no-reflow phenomenon incidence in STEMI patients with large thrombus burden. However, residual thrombus after thrombectomy increases no-reflow phenomenon occurrence.

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Low Event Rates At Long-term Follow-up In The Randomized Myocardial Infarction XAMI Trial Comparing First And Second Generation Drug Eluting Stents

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Background: Despite initial data of efficacy, concerns were raised regarding the risk of increased very late stent thrombosis (VLST) using first generation drug eluting stents (DES) compared to bare metal stents in patients with ST-elevation acute myocardial infarction (STEMI). Though second generation DES have shown even increased efficacy and lower rates of VLST in stable angina patients, no randomized data was available in STEMI. The XAMI trial (XienceV stent vs Cypher stent in primary PCI for Acute Myocardial Infarction) is the first randomized trial presenting three year follow-up data of second generation DES in STEMI patients.
Methods: 625 patients (all-comers) treated with primary PCI for STEMI were randomized 2:1 to everolimus-eluting stents (EES) or sirolimus-eluting stents (SES). Exclusion criteria were minimal. The primary endpoint was major adverse cardiac events (MACE), consisting of cardiac death, non-fatal myocardial infarction or any target vessel revascularization (TVR) at one year. Secondary endpoints included MACE at 3 years and stent thrombosis rates.
Results: At one year, non-inferiority of the primary endpoint was shown: 4.0% (EES) versus 7.7% (SES) (p = 0.048), suggesting superiority of the EES. Definite and/or probable stent thrombosis rate was low, 1.2% (EES) versus 2.7% (SES) (p=0.21). Radial approach was used in over 50 % of patients as was thrombus aspiration. First medical contact to balloon inflation time was a median of only 75 minutes. At three years, MACE rate was 8.0% (EES) versus 10.5% (SES) (p=0.30). Cardiac death rate was low at 2.5% (EES) versus 2.7% (SES) (p=0.86) as was overall target lesion revascularization (TLR) rate at 2.3%. Definite and/or probable stent thrombosis rate between one and three year was low with 1.1% for EES and only 0.5% for SES.
Conclusions: This contemporary all-comer STEMI trial showed very low cardiac mortality, TLR and stent thrombosis rates at three year follow-up with both first and second generation DES. With these low event rates no advantage of second generation DES could be seen.

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Clinical Utility of Peak Creatine Kinase-MB Measurements in Predicting Left Ventricular Dysfunction and Clinical Outcomes After First Anterior Myocardial Infarction: An INFUSE-AMI Sub-study

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Background: Primary PCI for STEMI may lead to rapid washout of CK-MB. There is insufficient information correlating peak CK-MB to infarct size.
Methods: NFUSE-AMI randomized pts with anterior STEMI undergoing bivalirudin supported primary PCI to intralesion abciximab vs. no abciximab and to manual thrombus aspiration vs. no aspiration. In 311 pts left ventricular (LV) ejection fraction (EF) and infarct size (as a percentage of total LV mass) were evaluated by cardiac magnetic resonance imaging (cMRI) at 30 days and compared to peak CK-MB. Pts were clinically followed for 1-year.
Results: Median peak CK-MB was 240 IU/L (IQR: 126 to 414) which was strongly correlated with infarct size evaluated by cMRI (Figure). Pts in the highest peak CK-MB tertile had significantly larger infarct size (32.3% vs. 21.7% vs. 5.7%, p<0.001) and lower LVEF (41.5% vs. 48.4% vs. 52.1%, p<0.001) than patients in the middle and lowest tertiles. Peak CK-MB of 200 IU/L predicted both a large infarct size (>20% of LV mass: sensitivity 94%, AUC 0.86) and LVEF <40% (sensitivity 91%, AUC 0.78). Furthermore, peak CK-MB was an independent predictor of 1-year