1001-110   Impact of Time to Reperfusion on Microvascular Damage After Primary Coronary Angioplasty for Acute Myocardial Infarction

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Backgrounds: A distinctive coronary flow velocity (CFV) pattern characterized by diminished systolic antegrade flow and rapid diastolic deceleration rate (DDR) is thought to reflect a greater degree of microvascular damage in the risk area. We evaluated the impact of time to reperfusion on microvascular damage after primary coronary angioplasty for acute myocardial infarction (AMI).
Methods: We studied 73 patients with a first anterior wall myocardial infarction, without cardiogenic shock, who underwent primary coronary angioplasty within 12 hours (h) of onset. CFV parameters were assessed immediately after reperfusion using a Doppler guidewire. We measured systolic velocity integral (SVI) and DDR as makers of microvascular damage, according to the previous studies.
Results: Reperfusion was achieved within 2 h in 9 patients (12%). SVI was significantly higher in patients with early reperfusion (<2h vs. 4 to <6h and >/=6h, P = 0.003). Peak CPK was significantly lower in patients with early reperfusion (<2 h vs. 2 to <4 h, 4 to <6h, and >/=6h, P = 0.002). There were no differences in other clinical characteristics by time to reperfusion.
Conclusions: Time to reperfusion, within 2 h, is important for preventing microvascular damage, which results in reduced infarct size. However, after 2 h, microvascular damage after primary coronary angioplasty is not dependent on time to reperfusion in patients with anterior AMI.

CFV parameters and clinical results by time to reperfusion

	<2h (n=9, 12%)	2 to <4h (n=38, 52%)	4 to <6h (n=13, 18%)	>/=6h (n=13, 18%)	P value
SVI, cm	3.8±1.7	2.2±2.6	0.5±1.8	0.4±2.1	0.003
DDR, cm/sec^2	37±19	126±101	139±132	143±122	NS
Peak CPK, IU/L	2041±1229	5402±2374	5500±3011	4867±1777	0.002
LVEF at 1M, %	66±10	53±11	55±15	54±11	0.04

1001-111   Use of Glycoprotein IIb/IIIa Receptor Blockers Before and During Percutaneous Coronary Intervention for Acute Coronary Syndromes Versus Stable Angina in Consecutive Patients in Europe: Results of the International SHAKESPEARE Registry

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Background: In early 2001, the *ACC / AHA Task Force on Practice Guidelines* published revised guidelines for percutaneous coronary interventions (PCI). At this time, no data exist to help understand how these guidelines are implemented into clinical practice, especially the use of GP IIb/IIIa receptor blockers (IIb/IIIa). The SHAKESPEARE REGISTRY has been designed to fill this informational void.
Methods: Since February 2002 consecutive patients undergoing PCI have been included in the international SHAKESPEARE registry to document clinical practice in 30 centers in different countries of the European Society of Cardiology (France, Germany, Israel, Italy, Portugal, UK).
Results: Out of 3,117 consecutive patients undergoing PCI 1,798 patients (58%) had acute coronary syndromes (ACS), 19.5% acute STEMI, 7.8% acute NSTEMI, 30.3% unstable angina, 1,251 patients (42%) underwent PCI for stable angina. IIb/IIIa were given in 48% of the ACS patients and in 26% of the patients with stable angina. In patients with stable angina IIb/IIIa was given because the patients were considered high risk or because of technical difficult PCI.
Conclusion: The use of IIb/IIIa was high in consecutive patients undergoing PCI for ACS with 22% even before the start of the intervention and 48% during the procedure. In consecutive patients undergoing PCI for stable angina IIb/IIIa was given in only a minority before the intervention but in more than one quarter of the patients during the PCI procedure.

	ACS (n=1,798)	Stable Angina (n=1,251)	p
Age (years)	64	64	ns
Male gender	74.8 %	78.1 %	<0.01
Prior MI	19.9 %	32.4 %	<0.01
GP IIb/IIIa before PCI	22.1 %	3.5 %	<0.01
Abciximab	7.4 %	1.3 %	<0.01
Tirofiban	3.7 %	0.9 %	<0.01
Eptifibatide	10.9 %	1.8 %	<0.01
GP IIb/IIIa during PCI	48.1 %	26.2 %	<0.01
Abciximab	21.2 %	14.3 %	<0.01
Tirofiban	8.2 %	1.4 %	<0.01
Eptifibatide	10.7 %	6.3 %	<0.01
Stent	75.7 %	74.8 %	ns
Bleeding complication	6.5 %	5.9 %	<0.01
Hospital mortality	2.9 %	0.4 %	<0.01

1001-112   Prognostic Value of the Absolute Degree of ST-Segment Elevation of the ECG at Baseline and After Primary Angioplasty: Analysis From the CADILLAC Trial

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Background: In pts with AMI undergoing reperfusion therapy, ST-segment resolution (STR), as calculated by relative reduction of ST elevation (STE) from the pre to the post reperfusion ECG, has been found to correlate strongly with survival. Whether the *absolute* degree of STE on the pre and post ECG is prognostically important is undetermined.
Methods: In CADILLAC, 2,082 pts were prospectively randomized to PTCA vs. stenting, each ± abciximab. Paired ECGs within 4 hours pre and post PCI with >1 mm baseline STE without bundle branch block, paced rhythm, ectopy, missing leads or artifact were available in 700 patients and analyzed by an independent core ECG laboratory.
Results: LAD infarction and lower baseline LVEF (p=0.01) were both associated with greater degrees of STE on the pre and post ECG. Additional correlates of residual STE on the post procedure ECG alone included hypertension, 3 vessel ds., smaller reference vessel diameter, larger balloon to artery ratio, and pre and post TIMI 0/1 flow (p<0.05 for all). The incidence and impact of different degrees of pre and post PCI STE of 1-year mortality appear in the table.
Conclusions: The magnitude of ST elevation pre and post PCI are both strongly and continuously predictive of late mortality after percutaneous intervention for AMI. In particular, >2 mm of STE on the post PCI ECG (present in nearly 1 in 6 pts) is a particularly ominous finding. The extent of STE should be considered when assessing baseline risk and the results of therapeutic interventions for AMI.

STE pre PCI	<2 mm	2 to <3 mm	3 to <4 mm	>4mm	P value
Incidence	22%	28%	19%	31%	-
1-year mortality	2.6%	3.1%	6.9%	7.5%	0.05
STE post PCI	<0.5mm	0.5 to <1 mm	1 to <2 mm	>2mm	P value
Incidence	32%	27%	25%	16%	-
1-year mortality	3.2%	3.3%	4.6%	12.4%	0.0002

1001-113   Improved Efficiency in Both Initial Reperfusion Therapy and Subsequent Acute Myocardial Infarction Care Through Commitment to Emergency Department-Initiated Primary Percutaneous Coronary Intervention

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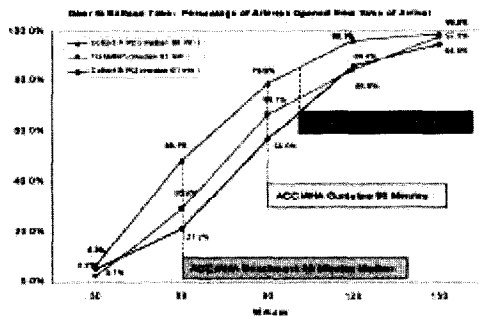
Study objective. Demonstrate improved efficiency of initial and subsequent in-hospital care following emergency department physician (ED)-initiated primary angioplasty (1'PCI) in ST-elevation infarction (STEMI).
Methods. An observational study was undertaken comparing outcomes of patients receiving process improvement initiative supported, ED-directed 1'PCI to prior treatment by a mix of ED and cardiologist co-determined thrombolysis and 1'PCI.
Results. 287 patients were treated. Median door-to-balloon time (MDBT) improved from 88 to 61 minutes (P<0.0001). Necessary subsequent in-hospital interventions (PCI or CAB) occurred in 65% of thrombolytic patients, versus 3% of 1'PCI patients, and 1% 1'PCI patients after process change (P< 0.0001). Median length of stay decreased from four days (thrombolytic) and three days (1'PCI) at baseline, to two days (1'PCI) postintervention (P<0.0001). Improved effectiveness outcomes included beta-blocker: 83% to 95% (P=0.0039), angiotensin-converting-enzyme inhibitor: 58% to 86% (P<0.0001), and antilipid therapy: 68% to 86% (P=0.0039). Favorable trends occurred in survival (98.8%)

and 30-day major adverse cardiac events (MACE) (4.9%).

Conclusions. ED-initiated 1'PCI for STEMI significantly improved efficiency of care as measured by MDBT, need for subsequent in-hospital intervention, and length of stay. Effectiveness measures demonstrating improvement or favorable trends included discharge medications, survival and MACE.

	No USD (n=80)	USD (n=80)	Change	p value
10' saline	31.4%	30.7%	---	0.32
20' saline	40.0%	41.0%	---	0.30
10' A	29.0%	34.1%	17.6%	0.0052
20' A	39.6%	44.8%	13.1%	0.0041
10' A+H	26.3%	36.1%	37.3%	0.0009
20' A+H	37.0%	48.5%	31.1%	0.00025

POSTER SESSION

1002   Acute Coronary Syndromes: Outcome

Sunday, March 30, 2003, 9:00 a.m.-11:00 a.m.
McCormick Place, Hall A
Presentation Hour: 9:00 a.m.-10:00 a.m.

1001-208   Multivessel Percutaneous Intervention for ST-Segment Elevation Myocardial Infarction: The Mayo Clinic Experience

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Introduction: The optimal treatment for patients presenting with ST segment elevation myocardial infarction (STEMI) with multiple critical stenoses is not established. In the current era of coronary stenting, with improved procedural outcomes, the simultaneous revascularization of multiple critical lesions may be a reasonable therapeutic strategy. **Methods:** We performed a retrospective analysis of the Mayo Clinic cardiac catheterization laboratory database to compare procedural and clinical outcomes following percutaneous coronary intervention (PCI) between 1995 and 2000 in patients with STEMI who underwent multivessel PCI (n=24) with others who underwent only infarct related artery (IRA) PCI (n=431). **Results:** Baseline variables were similar for the multivessel PCI and IRA PCI groups; the multivessel PCI group had significantly higher percentages of prior by-pass patients (21% vs. 8%, p=0.04) and of IIb/IIIa use (75% vs. 50%, p=0.02). Procedural success was similar between the two groups (83% vs. 82%). Logistic regression analysis of procedural success adjusted for age, gender, and prior bypass surgery failed to show that multivessel intervention was a factor (OR 1.22, 95% CI 0.63, 1.52; p=0.57). Mean follow-up of successfully treated patients was 2.2 ± 1.5 years in the multivessel intervention group and 2.7 ± 1.7 years in the single vessel intervention group (p= 0.21). The 3-year mortality was not different between the two groups (11.1% vs. 12.9% in the single vessel intervention group). Cox analysis of survival free of MI or target vessel revascularizations adjusted for age, gender and the presence of prior by pass surgery showed a hazard ratio of 1.51 (95% CI 0.76, 3.01; p=0.24) for the multivessel PCI group. **Conclusion:** Multivessel PCI in STEMI was feasible and safe with similar procedural and long term clinical outcomes as compared with IRA PCI for patients with multiple critical lesions. Prospective, randomized studies evaluating this important clinical observation are necessary.

1001-209   There Is Synergism of Aspirin/Heparin With Low Frequency Ultrasound for Clot Lysis: Potential for Clinical Application in Acute Coronary Syndromes

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Background: Aspirin (A) and/or heparin (H) are commonly used in acute coronary syndromes and urgent coronary interventions. Low frequency high-intensity ultrasound (USD) has been proven to be efficacious and synergistic with various anti-thrombotic and fibrinolytic agents for in-vitro and in-vivo clot lysis. However, there is currently little data on the possible synergism of aspirin with therapeutic USD for thrombus dissolution. **Methods:** Human blood clots from a single donor (n=160, age 3-6 hours, mean weight 316±23 mg) were incubated in normal saline and exposed to USD (27 kHz, 30 W, TIMI3, Santa Clara, CA) or no USD for 10 and 20 minutes. Clots were treated in solutions containing aspirin (Lysoprin, Rafa, Israel, 100mg/L) alone, and in combination with heparin (1,000 U/L). The concentrations of A & H were similar to those used as loading doses in clinical practice. The absolute percent of clot weight reduction and the relative incremental effect of USD exposure (D) were calculated. Results (Table). **Conclusions:** 1) low frequency high-intensity ultrasound significantly increases in-vitro clot lysis and is synergistic with aspirin alone or combined with heparin; 2) the highest incremental effect of ultrasound on clot lysis with the combination of aspirin and heparin; and 3) these findings suggest that transcutaneous low frequency ultrasound in combination with ASA and/or heparin has potential in the treatment of acute coronary syndromes.

1002-093   Prevalence of Diabetes in Acute Coronary Syndromes: The Effects of Gender and Age

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Background: Women with Acute Coronary Syndrome (ACS) are at significantly higher risk of coronary mortality than men with ACS, a difference that is most apparent in younger age groups. It has been hypothesized that diabetes mellitus (DM), a well-known risk factor for coronary disease and death, may contribute to the higher mortality rate in younger women with coronary artery disease (CAD). Although it has been demonstrated that women with CAD have significantly higher rates of DM than men, it is unknown whether this gender discrepancy in DM prevalence varies by age. We hypothesize that women age 30 - 74 years with ACS would have higher prevalence rates of known DM than men, and that this female predilection for diabetes would be most apparent in younger age groups. **Methods:** We prospectively reviewed 600 charts of patients age 30 - 74 years who were admitted to the Coronary Care Unit or General Cardiac Care Unit at Yale New Haven Hospital with suspected ACS, defined as unstable angina (UA) or myocardial infarction (MI). ACS was confirmed in 314 patients whose charts were then examined for history of DM to determine whether prevalence varied by gender or age. **Results:** Of the 314 patients aged 30 - 74 years with confirmed ACS, women had significantly higher rates of known DM than men (51% of women versus 27% of men, p<0.0001 for ACS; 48% of women versus 20% of men, p<0.0002, for MI only). Further analysis revealed that the gender difference in DM prevalence was confined to patients below the age of 65. In this group, 53% of women with ACS had DM versus 21% of men (p<0.001), 48% of women with MI had DM versus 13% of men (p=0.0001), and 60% of women with UA had DM versus 35% of men (p=0.05). Above 65 years, gender differences in the prevalence of DM were no longer significant. **Conclusion:** The prevalence of DM is significantly higher in women with CAD than men, and this gender difference is specific to patients below age 65 years. Whether the higher prevalence of DM in younger women contributes to their higher cardiac-related mortality requires further study.

1002-100   Impact of High-Sensitivity C-Reactive Protein on Long-Term Mortality of Acute Myocardial Infarction in the Reperfusion Era

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Background: Because C-reactive protein (CRP) measured shortly after the onset of acute myocardial infarction is associated with infarct size, prognostic value of CRP is controversial. However, reduction of CRP was accelerated by reperfusion and CRP peaked around 3 days after the onset. Therefore, CRP, which was measured at stable phase in acute myocardial infarction patients treated predominantly with reperfusion therapies, may be independent of infarct size and may predict long-term mortality. **Purpose:** To examine whether CRP levels, which were measured at stable phase, are associated with infarct size or not and to determine the impact of CRP on long-term mortality of acute myocardial infarction in the reperfusion era. **Methods:** We studied 1309 patients with acute myocardial infarction enrolled in Osaka Acute Coronary Insufficiency Study between April 1998 and Jun 2001. CRP was measured at 14 days or later (mean, 25 days after the onset). The patients were followed for a mean 522 days. **Results:** Reperfusion therapies were performed in 90.0% of patients. Patients in the highest quartile of CRP (>0.38 mg/dl) were older, had higher prevalence of diabetes mellitus, and had higher Killip classes than patients in lower 3 quartiles (<0.38 mg/dl). Multivariate logistic regression analysis revealed that CRP was independently associated with age and absence of revascularization therapies but was not associated with peak CK≥3000IU/L. Patients in the highest quartile had higher long-term all-cause mortality and cardiovascular mortality rates than patients in lower 3 quartiles (8.9% versus 2.0%, p<0.001; 6.4% versus 0.8%, p<0.001). Multivariate logistic regression analysis revealed that the highest quartile was an independent predictor of long-term all-cause mortality (odds ratio, 4.84; 95% confidence interval, 1.37 to 17.1) and cardiovascular mortality (odds ratio, 10.8;