

the A+W group (39%, 12%, 19% vs 22%, 39% and 39%, $p = 0.003$). 20 A pts vs only 4 A + W pts showed angina pectoris in the follow up ($p = 0.011$), while there was no significant difference in the occurrence of other morbid events. Thus, we conclude that A + W leads to a more favourable remodeling of the coronary tree after thrombolysis, facilitating thrombus regression and improving angina symptoms. The effects on other clinical events should be investigated in a large trial.

973-67 The Value of Immediate Coronary Angiography With Primary PTCA Standby in the Triage and Treatment of Acute Myocardial Infarction at Community Hospitals Without Heart Surgery: Experience in 305 Cases

Thomas P. Wharton, Nancy S. McNamara, James M. Schmitz, Frank A. Fedele, Alan R. Gladstone, Mark I. Jacobs. *Exeter Hospital, Exeter, NH*

Recent studies support the value of immediate coronary angiography in risk stratification and triage of patients with acute myocardial infarction (AMI). Early knowledge of coronary anatomy can identify patients (pts) at high risk who require early bypass surgery, and can spare unnecessary thrombolytic therapy in pts who have patent vessels after aspirin and heparin, occlusion of minor branches, or mistaken diagnosis. These benefits may enhance the therapeutic value of primary PTCA. We examined the outcomes of immediate coronary angiography in 305 consecutive pts with suspected AMI who underwent emergent cath with PTCA standby at two community hospitals without on-site bypass surgery. CHF was present in 37%, 15% presented in shock, and 9% in ventricular fibrillation. Only 25% were "low-risk" (age < 70, EF > 45%, 1-2 vessel disease); 36% were > 65 yo; 31% were women.

Results: PTCA was performed in 217 pts (71%). Procedure success rate was 94%, median time to reperfusion 93 min, reocclusion rate 6%, reinfarction rate 3.7%, in-hospital mortality 6.8% (2.9% in non-shock pts). No pt needed emergency CABG because of PTCA complications. Patent arteries (TIMI-3 flow) were not dilated. Of the 88 pts who did not have PTCA, 81 (27% of the entire group) would not have benefited from lytic therapy: the artery was patent on the first angiogram in 50 pts and was a small or secondary vessel in 4; the diagnosis of AMI was discovered to be incorrect in 12, and 15 had life-threatening coronary anatomy that required immediate transfer (with IABP) for bypass surgery. 30% had bypass surgery within 24 h. Another 6 had lesions unsuitable for PTCA; intracoronary urokinase achieved patency in 3 of these. The in-hospital mortality of this no-PTCA group was 1.1%, including surgery. The entire cohort of 305 patients had an in-hospital mortality rate of 3.4% (shock mortality 22%, non-shock mortality 2.0%).

Conclusion: Immediate catheterization with PTCA standby in suspected AMI can be performed safely and effectively in community hospitals without cardiac surgery. Initial angiography enabled informed therapeutic decisions, including early selection of highest risk pts for bypass surgery and avoidance of the risk and expense of lytics in an important fraction of the population.

973-68 Cardiogenic Shock After Acute Myocardial Infarction: Successful Bridge to Transplantation With the Implantable Left Ventricular Assist Device

Nicholas G. Smedira, Amit N. Patel, Rita Vargo, Robert E. Hobbs, James B. Young, Patrick M. McCarthy. *Cleveland Clinic Foundation, Cleveland, Ohio*

Acute myocardial infarction (AMI) complicated by cardiogenic shock is frequently fatal. In this setting, implanting LVADS as a bridge to transplantation is thought to be contraindicated because of small LV chamber size and friable myocardial tissue. From December, 1992 to July, 1995, 9 patients in cardiogenic shock at a mean of 6 days after an AMI received a HeartMate LVAD. The mean patient age was 49 yrs and 5 (55%) were female. Large anterior or anterior-lateral infarctions were present in all pts; 4 (44%) required CPR, 8 (89%) were on an IABP and 3 (33%) were supported by ECMO. Satisfactory LVAD inflow cannula position was confirmed by intraoperative TEE in all pts. There were no bleeding complications or ventricular disruptions secondary to LV apical cannulation. One pt with RV failure required RVAD support and two pts with severe pulmonary edema were managed by veno-veno ECMO (1 pt) and RVAD-ECMO (1 pt). Hemodynamics improved significantly in all pts.

	Pre-LVAD	Post-LVAD	p Value
CI (L/min/m ²)	1.8 ± 0.43	2.9 ± 0.68	0.002
LAP (mmHg)	22 ± 5.1	13 ± 3.4	0.008
RVEF (%)	22 ± 5.0	38 ± 11	0.031

Eight pts (89%) survived and were discharged from the ICU at a mean of 8 days (range:3-30). The one death from multiple organ failure and all major complications occurred in pts who had pre-LVAD CPR and needed an RVAD or ECMO. All pts were in NYHA FC I or II before transplant after a mean of

97 days (range:39-144) of support. All transplanted patients are alive. We believe the implantable LVAD can be used to treat cardiogenic shock after an AMI in young moribund patients provided that support is initiated before other organ injury.

974 Acute Myocardial Infarction: Predictors of Outcome

Tuesday, March 26, 1996, 3:00 p.m.-5:00 p.m.
Orange County Convention Center, Hall E
Presentation Hour: 3:00 p.m.-4:00 p.m.

974-54 RECPAM (RECURSIVE Partition and AMalgamation), a Novel Statistical Approach for Early Prediction of Outcome in Patients With Acute Myocardial Infarction

Fabrizio Carinci, Claudio Fresco, Aldo P. Maggioni, Antonio Nicolucci, MariaGrazia Franzosi, Gianni Tognoni. *M. Negri Institute, Milano and S. Maria Imbaro, Italy*

Aim of this study was to evaluate the ability of a new statistical approach to predict in-hospital outcome in pts with acute myocardial infarction (AMI). In pts enrolled to GISSI-2 study all the variables available at admission to CCU were used. In-hospital mortality was chosen as end-point. This method identifies homogeneous and distinct subgroups with respect to pre-specified criteria. The algorithm subdivides the population using the variables in a hierarchical approach, identifying for every division the variable and the cut off that most efficiently creates two subgroups with different outcome rate. The terminal subgroups are successively merged to create a set of classes statistically distinct with respect to the primary end-point. The following variables were submitted to the RECPAM algorithm: infarction site, Killip class, smoking habit, history of previous MI, hypercholesterolemia, hypertension, diabetes, age, gender, heart rate, blood pressure, familiar history of MI.

A total of 15 terminal subgroups were identified. In the lowest risk subgroup 4 events out of 1116 pts were recorded, while in the highest risk subgroup 226 events were recorded in 438 pts. After the amalgamation step RECPAM identified 7 classes with statistically different mortality. Compared with the lowest risk class, the six classes had an odd ratio of 5.4 (95%CI 3.0-9.8), 13.8 (95%CI 7.6-25.3), 22.0 (95%CI 12.0-40.2), 44.9 (95%CI 25.1-80.2), 91.5 (95%CI 50.7-165.0) and 208.6 (95%CI 114.8-379.0) respectively. In particular three subgroups in Killip 1 class had a statistically significant worse prognosis compared to one subgroup of pts who presented with Killip class 2 at entry.

In conclusion, RECPAM, using a tree structured algorithm, was able to identify very efficiently the in-hospital prognosis of pts with AMI from the available variables at CCU entry.

974-55 Centralized Systematic Adjudication of Clinical Endpoints in Multicenter Trials of Acute Coronary Syndromes Identifies Patients At High Risk for Adverse Clinical Outcomes

Kenneth W. Mahaffey, Christopher B. Granger, Lynn Woodlief, Barbara E. Tardiff, Shirley Bandy, Robert M. Califf. *Duke University Medical Center, Durham, NC*

A centralized Clinical Events Committee (CEC) adjudicated suspected reMIs (reMI) that were identified by computerized triggers applied to case report form data in the GUSTO-IIa trial. We compared the clinical outcomes for patients with suspected reMI about whom the CEC and investigator agreed there was a reMI and for patients about whom the CEC and investigator disagreed there was a reMI with the following results:

Outcome	Agreements		Disagreements	
	Both 'No'	Both 'Yes'	CEC 'Yes'	CEC 'No'
30-day Death	15 (7%)	20 (20%)	4 (13%)	14 (24%)
Recurrent Angina	61 (31%)	80 (80%)	13 (43%)	38 (64%)
Heart Failure	22 (11%)	26 (26%)	4 (13%)	9 (15%)
Shock	14 (7%)	21 (21%)	1 (3%)	9 (15%)
Total Patients*	195	100	30	59

*Not all patients with reMI had one of these outcome events.

The CEC and investigator disagreed in 23% of the cases with suspected reMI. When both agreed that reMI occurred, patients with reMI had higher rates of adverse outcomes compared with patients without reMI. For cases with disagreements, the CEC identified 36 cases meeting the definition for reMI that had intermediate rates for adverse events. The investigators identified 59 additional reMIs not meeting strict criteria used by the CEC for reMI but associated with a high incidence of adverse outcomes.

In conclusion, CEC adjudication identified patients at high risk for adverse events. Strict definitions applied by CEC failed to identify certain high risk events identified by investigators suggesting that refined definitions may be needed.

974-56 Is Gender An Independent Predictor of Angiographic & Adverse Outcomes Following Thrombolysis?

C. Michael Gibson, Carolyn H. McCabe, Susan J. Marble, Robert N. Piana, Christopher P. Cannon, Eugene Braunwald for the TIMI 4 Investigators. *Brighton and Women's Hospital, Boston MA*

Demographic data from 104 women (♀) and 289 men (♂) TIMI 4 pts were examined to determine if there are gender related differences in angiographic and clinical outcomes following thrombolysis. ♀ had lower Corrected TIMI Frame Counts (CTFC) (i.e. faster velocity) (34.6 ± 15.4 vs 40.8 ± 21.2, p = 0.04), smaller minimum lumen diameters (MLD) (0.76 ± 0.32 vs 0.88 ± 0.41 mm, p = 0.019), & smaller normal vessel diameter (3.11 ± 0.88 vs 3.48 ± 0.93 mm) compared with ♂. The body surface area (BSA) of ♀ was 13% smaller than that of ♂ (1.75 ± 0.19 vs 1.98 ± 0.18 m², p < 0.001). Once BSA was corrected for, there was no gender differences in the CTFC (♀ = 20.4 ± 10.0, ♂ = 20.6 ± 10.8 frames/m²), MLD (♀ = 0.45 ± 0.19, ♂ = 0.45 ± 0.21 mm/m²), or normal vessel diameter (♀ = 1.81 ± 0.58, ♂ = 1.76 ± 0.47 mm/m²). There were also no significant differences between ♀ vs ♂ in TIMI flow grade distribution, % stenosis, frequency of 3 vessel dz, h/o previous MI, and culprit vessel location. ♀ were older than ♂ (64.4 ± 9.3 vs 56.8 ± 10.7, p = 0.0001). The risk of an adverse outcome (AO = death, recurrent MI, severe CHF, shock, EF < 40%) for ♀ (37/104, 35.6%) was > than ♂ (64/289, 22.1%, p = 0.007), but pts with AOs were also smaller (1.85 ± 0.22 vs 1.94 ± 0.20 m², p < 0.001). In a multivariable model of AO, BSA (p = 0.03) & age (p = 0.025) were independent predictors of AO while gender was not. **Conclusions:** Once BSA and age were corrected for, no differences were observed between ♀ & ♂ in arterial dimensions, flow velocities, and adverse outcomes.

974-57 Usefulness of Serial ECG Monitoring to Risk Stratify Chest Pain Patients With A Nondiagnostic Initial ECG

Francis M. Fesmire, Robert F. Percy, Jim B. Bardonner, Frank B. Calhoun, Jeffery V. Atkins. *University of Tennessee, Chattanooga, TN; University of Florida, Jacksonville, FL*

Risk stratification of patients admitted for chest pain is important for optimal triage and management. We evaluated changes seen in ≥ 2 contiguous leads on automated serial ECG monitoring (SECG) during the emergency department (ED) evaluation of 415 admitted chest pain patients whose initial ECG was nondiagnostic for injury or ischemia for predicting acute myocardial infarction (AMI) and life-threatening complications (LT Comp). Diagnostic changes (DxΔ) on SECG were defined as new injury, ischemia, or BBB. Nondiagnostic changes (NonDxΔ) were non-dx T wave inversions, normalization of inverted T waves, and non-dx ST Segment deviations of ≥ 1 mm. Patients with a DxΔ SECG had a 7.4 times greater risk of AMI (P < 0.001) and a 7.3 times greater risk of LT Comp (P < 0.001) as compared to the sum total of all other patients. Patients with a NonDxΔ SECG had a 2.2 times greater risk of AMI (P = 0.03) and a 1.7 times greater risk of LT Comp (P = NS) as compared to patients with a no change (NoΔ) SECG.

	AMI	LT Comp
DxΔ (N = 35)	19 (54.3%)	10 (28.6%)
NonDxΔ (N = 86)	11 (12.8%)	5 (5.8%)
NoΔ (N = 297)	17 (5.7%)	10 (3.4%)

Conclusion: SECG monitoring during the ED evaluation effectively stratifies admitted chest pain patients with a nondiagnostic initial ECG into high and low risk groups for AMI and LT Comp.

974-58 Histopathologic Comparison of Culprit Vs. Non-Culprit Lesions in the Same Patient: Multivessel Atherectomy Tissue Analysis in Acute Coronary Syndromes

Samin K. Sharma, Saeed Siddiqui, Billie Fyfe, Ram Bongu, Srinivas Duvvuri, Jonathan D. Marmor, Thomas P. Cocke, John A. Ambrose. *Mount Sinai Hospital, NY*

Histopathology analysis of tissues obtained by directional coronary atherectomy (DCA) in pts with unstable angina and myocardial infarction has shown a higher incidence of thrombus, inflammation and lipids as compared to the tissues obtained from stable pts. In some of these pts, with multivessel disease, significant non-culprit lesion may also exist and the histopathology of

these non-culprit lesions has not been described. **Methods:** We describe the histopathology results of paired tissues obtained by DCA of 12 culprit and 12 non-culprit lesions in 12 pts with acute coronary syndromes and multivessel DCA. Tissues were analyzed for sclerosis, cellularity, matrix, cholesterol clefts/foam cells, inflammatory cells, calcification, thrombus and deep wall components. **Results:**

Characteristics	Culprit Lesions (n = 12)	Non-culprit Lesions (n = 12)	p
Intimal hyperplasia	33%	25%	ns
Cholesterol cleft/Foam cell	66%	25%	0.055
Inflammatory cells	50%	16%	0.1
Calcification	33%	58%	ns
Media/Adventitia	41%	16%	ns
Thrombus	41%	0%	0.04

Conclusions: Atherectomy tissue analysis of culprit lesion reveals a higher incidence of cholesterol clefts/foam cells and thrombus than in non-culprit lesions in the same patients. These data are consistent with prior autopsy studies suggesting that, in comparison to stable plaques, lipid-laden plaques are more prone to thrombotic complications resulting in acute coronary syndromes.

974-59 Recovery of Left Ventricular Function After Coronary Thrombolysis Is Predicted by Rapid Changes in Both Creatine Kinase MM Isoforms and ST Segments

Donatella Ferrini, Marcello Galvani, Filippo Ottani, Ottorino Capatano, Franco Rusticali, Paul R. Eisenberg¹, Dana R. Abendschein¹. *Divisione di Cardiologia and Fondazione Sacco, Forli, Italy; ¹ Washington University, St. Louis, MO*

To determine whether improvement of LV function after coronary thrombolysis can be predicted by changes in plasma profiles of creatine kinase (CK) isoforms and ST segments, which have been shown to be associated with recanalization, we monitored two-lead ST segments continuously and assayed plasma CK-MM isoforms every 60 min over 3 hrs after the start of lytic therapy in 31 patients with AMI. Criteria for reperfusion were rapid decrease of ST elevation > 50% (ST criteria) and rates of increase of tissue isoform (MM 3%) > 0.18% min (MM criteria). Wall motion score index (WMSI-16 segments) and infarct zone WMSI (IZ-WMSI) were calculated from 2-D echoes at baseline (< 3 hrs) and at 2 months. Improvement in LV function defined as decreases in IZ-WMSI > 20%, was present in 19 (55%) and absent in 12 (45%) patients.

IZ-WMSI ≥ 20%	MM Criteria	ST Criteria	Both Criteria
PPV	78%	76%	90%
NPV	100%	100%	100%

PPV = positive predictive value; NPV = negative predictive value.

Infarct artery patency (TIMI-3) assessed within 5 days was 95% in pts with both MM and ST criteria vs 60% in pts who met only one, or neither criterion (p < 0.05). WMSI at 2 months was 1.3 ± 0.3 vs 1.7 ± 0.3 (p < 0.001), respectively. Thus, improvement in LV function best predicted by concurrent rapid resolution of ST elevation and accelerated appearance of MM3, which probably reflects restoration of adequate perfusion.

974-60 Angiographic Assessment of Myocardial Perfusion Does Not Correlate With Scintigraphic Detection of Viability

Anatoly Langer, Shaun G. Goodman, Dmitry Mironov, Michael R. Freeman. *St. Michael's Hospital, Toronto, ON, Canada*

Angiographic assessment of myocardial perfusion in territory of infarct related artery is frequently described by TIMI flow. Recently frame count (FC) has been suggested as a more precise measurement. Accordingly, we studied the relationship between FC and scintigraphic evidence of myocardial viability based on thallium uptake after rest injection in 46 pts with recent AMI who underwent coronary angiography within 21 days. FC was from initial injection of contrast to first opacification of the entire vessel. Thallium uptake was assessed visually (0-normal, 1-mildly, 2-moderately, and 3-severely reduced, 4-absent) in 7 anterior and 6 posterior segments subserved by infarct related artery.

No relationship (r = 0.17, p = 0.26) was found between FC and thallium score. Similarly, normalization of FC by culprit FC/non-culprit FC (r = 0.01, p = 0.9) and normalization for heart rate (r = -0.1, p = 0.3) or perfusion pressure (mean arterial pressure - LVEDP) did not reveal relationship (r = -0.29, p = 0.2). Lack of relationship between FC and thallium score was also seen in pts with TIMI II or TIMI III patency: FC was greater in 10 pts with TIMI II (147.5 ± 38.96) than in 36 pts with TIMI III flow (81.58 ± 26.02, p =

TUESDAY POSTER