

790 Clinical Correlates of Electrocardiography in Acute Myocardial Infarction

Wednesday, March 22, 1995, 10:30 a.m.–Noon
Ernest N. Morial Convention Center, Room 91

10:30

790-1 The Admission Electrocardiogram-Characteristics Identifying a Subgroup at Increased Risk for Reinfarction

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In previous studies we have shown good correlation between different patterns of the admission ECG's and outcome in acute myocardial infarction (AMI). The current study assesses the correlation between patterns of the admission ECG and occurrence of reinfarction within 30 days of admission in 2603 pts with AMI enrolled in 25 centers in Israel for the GUSTO trial. All pts were admitted within 6 hours from onset of symptoms and received either STK or tPA intravenously. Only pts with ST elevation and positive T waves were included. Pts were allocated into 2 groups based on the absence (group A; 1232 pts) or presence (group B; 1371 pts) of distortion of the terminal portion of the QRS on the admission ECG: i.e. emergence of the J point at a level above the lower half of the R wave in leads with qR configuration or disappearance of the S wave in leads with an Rs configuration. There were no differences between the groups in the prevalence of previous angina, AMI, diabetes mellitus, hypertension, current smoking, anterior infarction, or the time elapsed from onset of symptoms to therapy. Using logistic regression model, only the following parameters were found to be independent predictors for reinfarction:

	Odds Ratio	95% Confidence Interval	P value
Initial ECG Pattern	2.59	1.31-5.13	0.006
Q wave on admission	2.32	1.15-4.68	0.05
Hypertension	2.05	1.10-3.84	0.02
Diabetes Mellitus (yes vs. no)	1.95	0.99-3.82	0.05

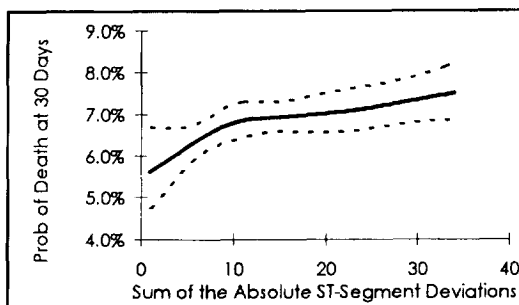
Distortion of the terminal portion of the QRS on the admission ECG is associated with significantly higher risk for reinfarction in pts with AMI undergoing thrombolytic therapy.

10:45

790-2 Baseline Electrocardiogram Predicts 30-day Mortality Among 32,812 Patients with Acute Myocardial Infarction Treated with Thrombolysis

K. Michael Zabel, William R. Hathaway, Eric D. Peterson, Christopher B. Granger, Paul W. Armstrong, Douglas Morris, Galen S. Wagner, Robert M. Califf, GUSTO Investigators *Duke University Medical Center, Durham, NC*

To determine the initial electrocardiographic variables predictive of survival among patients with acute myocardial infarction, we analyzed the baseline 12-lead ECGs in 32,812 patients enrolled into the GUSTO trial. All patients had ≥ 0.1 mV of ST segment elevation in at least one lead and received thrombolytic therapy. Those with LBBB or ventricular rhythm were excluded from analysis. Clinical follow-up was $>99.5\%$ complete. 2218 (6.8%) patients died within 30 days of the initial ECG. Death within 30 days was more common in patients with RBBB (17%), LAFB (14%), and LPFB (17%), than in those with a normal conduction pattern (6%). Patients with ECG evidence of previous MI in a location distinct from the acute MI had a higher risk of death (9.8% vs. 5.9%) than those without prior infarction ($p < 0.0001$). The variable having the greatest univariate predictive power for 30-day survival was the sum of the absolute ST-segment deviation in each lead ($\chi^2 = 341$), as shown in the following mortality curve.



Other ST segment variables that predicted 30-day survival were the sum of ST-segment elevation in each lead ($\chi^2 = 287$), the maximum ST elevation in any one lead ($\chi^2 = 257$), and the number of leads with ST elevation ($\chi^2 = 250$). When multivariate modeling was performed the sum of the absolute ST deviations, number of leads with ST elevation, prior ECG MI, RBBB, and LAFB each added independent prognostic information.

We conclude that an ECG at the time of presentation contains substantial prognostic information which can be used to help stratify risk among thrombolytic-treated patients with acute myocardial infarction.

11:00

790-3 ECG Changes During the First 48 Hours of Myocardial Infarction are Similar in Pts with TIMI 2 and TIMI 3 and Differ from Pts with TIMI 0/1

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It has been suggested that the ECG development (ST segment, QRS score) of acute myocardial infarction (MI) pts with TIMI 2 flow is closer to TIMI 0/1 than to TIMI 3. To study this, 358 acute MI pts treated with thrombolytic therapy were investigated. Sum of ST deviation (Σ ST) and QRS score of the 12 lead ECG were calculated at 3 time points during the first 48 hours: ECG 1: on admission (mean 90 min after onset of MI), ECG 2: mean 9 hours after MI, and ECG 3: mean 36 hours after MI. ECG's were related to the TIMI flow determined from the last view of angiography 60 and 90 min after start of thrombolytic therapy.

Results:

ECG		TIMI		TIMI			
		2	3	0/1	2/3		
N		46	248	64	294		
Σ ST (mm)	1	16.1	ns	15.5	ns	15.6	
	2	6.5	ns	5.3	10.2	***	5.5
	3	5.1	ns	4.7	6.1	*	4.8
QRS-score	1	2.9	ns	2.9	2.6	ns	2.9
	2	3.9	ns	4.5	4.5	ns	4.4
	3	5.1	ns	5.2	6.3	**	5.2

*p < 0.05; **p < 0.01; ***p < 0.0001

Conclusion: TIMI 2 patients have significantly less ECG changes at 9 hours and later than patients with TIMI 0/1 flow. Electrocardiographically, patients with TIMI 2 flow behave like pts with TIMI 3 flow.

11:15

790-4 The Prognostic Importance of Anterior ST-Segment Depression in Inferior Myocardial Infarctions: Results in 16,185 Patients

Eric D. Peterson, William R. Hathaway, K. Michael Zabel, Lynn H. Woodlief, Christopher B. Granger, Galen S. Wagner, Eric J. Topol, Eric R. Bates, Robert M. Califf *Duke University Medical Center, Durham, NC*

The prognostic significance of anterior ST-segment depression (ST DEP) in patients with an acute inferior MI remains controversial, in part because of limited sample size in previous studies. Using data from the GUSTO trial, we investigated the clinical outcomes of 16,185 patients with inferior MI. 12,019 (74.3%) of these patients had at least 0.1 mV ST DEP in leads V1-V3 on initial EKG as determined by Core Lab review. Patients with anterior ST DEP were older and more likely to be female or have a history of smoking. Patients with anterior ST DEP also had significantly higher peak CPK levels (mean 2,520 vs. 1,216 ng/dL, $p < 0.01$). Of the 7,455 (46%) patients with an inferior MI who received cardiac catheterization, those with anterior ST DEP had similar rates of LAD disease (24.8% vs 24.9%, $p > 0.5$), and multivessel disease (31.1% vs. 29.4%, $p > 0.25$), but a significantly lower mean LV ejection fraction (53.8% vs. 56.4%, $p < 0.01$) compared with those without ST DEP. In-hospital complications and 30-day mortality results as a function of the sum of anterior ST DEP are displayed below:

Sum of Anterior ST DEP (mV)	% Killip $\geq 3^*$	% 2°-3° AV Block*	% Reinfarction	% 30-day Mortality*
None (n = 4,166)	3.9	9.6	3.4	3.2
0.1-0.2 (n = 4,449)	5.3	11.2	4.4	3.6
0.3-0.4 (n = 3,328)	5.6	11.9	4.3	4.4
≥ 0.5 (n = 4,244)	9.2	14.5	4.6	6.6

*p < 0.001 comparing inferior MI patients with and without anterior ST DEP

Conclusion: Among inferior MI patients, the presence of anterior ST-segment depression predicted larger infarctions and predicted worse post-MI LV function. Although the overall rates of complications and mortality were low in inferior AMI patients, these risks increased substantially with increasing anterior ST depression. Thus, the magnitude of anterior ST de-