

# Baseline characteristics, management practices and in-hospital outcomes of patients hospitalized with acute coronary syndromes in the Global Registry of Acute Coronary Events (GRACE)

The GRACE study is a multinational observational prospective registry that describes the epidemiology, management, and outcomes of patients with the spectrum of ACS. Unlike the restricted populations enrolled in randomized clinical trials, the GRACE population comprises unselected patients with STEMI, NSTEMI and UA. The aim of this article is to summarize the initial findings, focusing specifically on the clinical and demographic characteristics of these patients, their management and hospital-associated outcomes.

## Results

This report is based on data from 11,543 patients enrolled in the registry, of whom 30% had STEMI, 25% NSTEMI, 38% unstable angina, 4% "other cardiac" diagnoses and 3% "non-cardiac" diagnoses. Approximately half of the patients were aged 65 years or older, most had a history of smoking (45% were smokers at admission), and over 50% had a history of hypertension. Patients admitted for STEMI were younger than those admitted for NSTEMI or UA, and the rates of previous MI, angina, stroke, or myocardial revascularization were much higher in patients with UA than those with an infarction. Over 20% of patients with STEMI were on prior aspirin therapy, compared with 57% of

those with UA. Nearly 10% of patients were participating in a clinical trial involving antiplatelet, antithrombin or anticoagulation agents before the qualifying episode of ACS.

At least 90% of patients received aspirin during the index hospitalization and approximately 75% received beta-blockers. Surprisingly, 23% of patients failed to receive any form of heparin during the first 24 hours after admission. However, most received UFH during the period of hospitalization and 40 to 50% received LMWH. Thrombolytic therapy was used in 47% of patients with STEMI, and PCI in 40% (Table 1); 38% of STEMI patients failed to receive any form of reperfusion therapy.

The in-hospital mortality rate was higher in patients with a myocardial infarction compared with those with UA (Figure 1). A significant proportion of patients experienced recurrent angina pectoris with or without ECG changes (Figure 2). Stroke was a relatively rare event. Major bleeding (mainly vascular access site, gastrointestinal and intracranial) occurred less frequently in the UA group than in the STEMI or NSTEMI groups. Hospital length of stay was highest in patients with STEMI (median 8 days) compared with NSTEMI (6 days) and UA (5 days;  $P < 0.0001$ ).

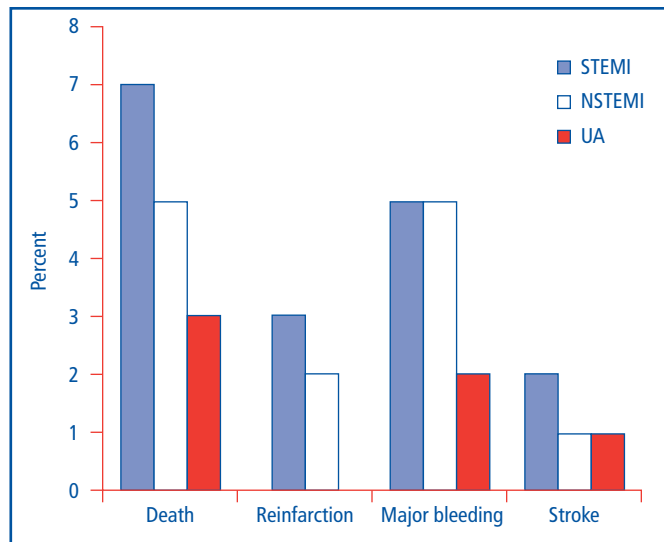
**Table 1.** In-hospital treatments (all  $P < 0.0001$  across the ACS groups). Adapted from P.G. Steg. *Am J Cardiol* 2002; 90: 358-63

Treatment (some patients received more than one treatment)	STEMI (n = 3419)	NSTEMI (n = 2893)	UA (n = 4397)
Aspirin (%)	95	91	90
Beta-blocker (%)	81	78	74
LMWH (%)	41	51	46
UFH (%)	66	61	47
Thrombolytic agent (%)	47	5	4
GP IIb/IIIa inhibitor (%)	23	20	7
GP IIb/IIIa inhibitor without PCI (%)	5	8	2
GP IIb/IIIa inhibitor during PCI (%)	51	51	28
Calcium blocker (%)	15	29	38
PCI (%)	40	28	18
Coronary angiography (%)	55	53	42
CABG (%)	4	10	5

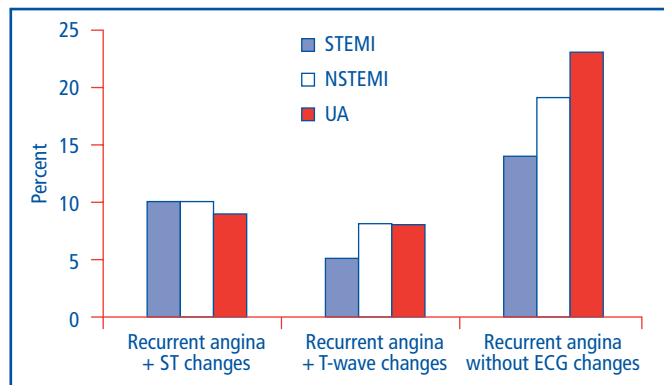
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**Figure 1.** Hospital outcomes (highly significant differences across the three groups for all outcomes [P=0.0002 for reinfarction; all others P<0.0001])



**Figure 2.** In-hospital recurrent angina (P<0.0001 across the three groups for each type of recurrent ischemia)

## Discussion

The strict inclusion and exclusion criteria employed in randomized clinical trials result in highly selected populations of patients, and tend to be conducted in restricted geographical locations. Elderly patients and women, for example, tend to be under-represented in clinical trials. By contrast, patients enrolled in the multinational GRACE registry are more representative of those seen in everyday clinical practice in various countries throughout the world. In this study, around half of the patients were aged over 65 years, a common cut-off point used in clinical trials, and one-third were female.

In this study, the rate of in-hospital recurrent angina with ST-segment changes was between 8% and 10%. Given that recurrent ischemia is an indicator of a poor prognosis, these data demonstrate that improved therapeutic strategies are still needed to reduce the risk of in-hospital treatment failure.

Interestingly, despite data demonstrating the benefit of GP IIb/IIIa inhibitors in ACS patients,<sup>1-4</sup> only a minority of patients received this treatment. Less than 30% of UA patients who underwent PCI received a GP IIb/IIIa inhibitor. In patients not undergoing PCI, only 8% of NSTEMI and 2% of unstable angina patients received GP IIb/IIIa antagonists. Similarly, only a

minority of STEMI patients underwent primary angioplasty, and 38% failed to receive any form of reperfusion therapy, a figure that clearly shows considerable room for improvement in the treatment of these patients.

## References

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