Management of acute coronary syndromes. Variations in practice and outcome: findings from the Global Registry of Acute Coronary Events (GRACE)

Over the past decade advances have been made in the treatment of ACS based on the results from randomized clinical trials and published treatment guidelines.[1] The degree to which evidence-based treatments are applied in the "real world," and their effect on outcomes in the broad spectrum of patients seen in clinical practice, is uncertain. The aim of this study is to investigate variations in the management of ACS patients and the subsequent impact on hospital outcomes using unselected data from the ongoing multinational GRACE study.

Results

This study is based on data from 11,543 ACS patients, of whom 38% had a final diagnosis of UA, 30% STEMI, 25% NSTEMI, and 7% other or non-cardiac diagnoses. The mean age for all ACS categories was similar, 65±13 years, two-thirds were male (66%), one-third had a history of MI, and almost 10% were participants in a clinical trial. Patients with a prior MI and those who had undergone a previous cardiac catheterization were more likely to present to teaching than non-teaching hospitals and to sites with access to a cardiac cath lab than to sites without facilities.

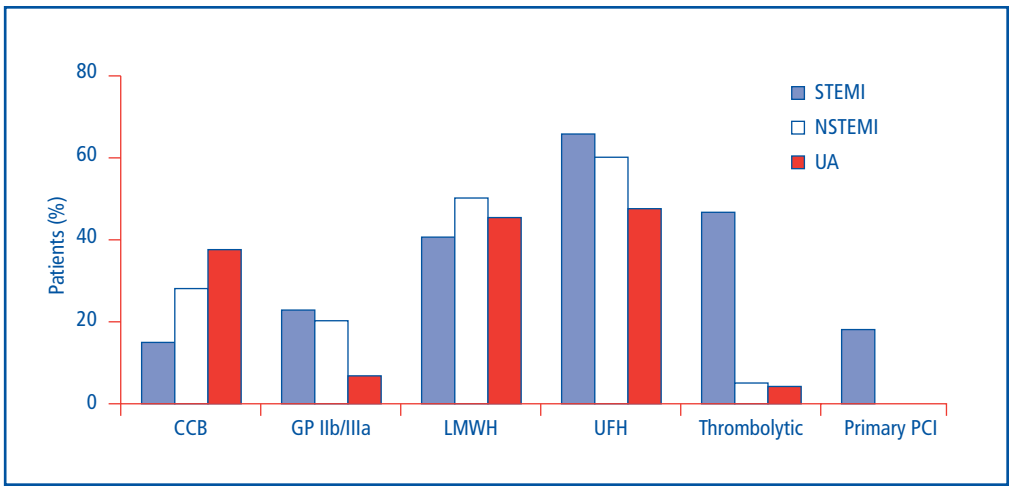
Aspirin use was adopted widely across all hospital types and geographic regions, with over 90% of patients receiving this treatment. LMWH was used less frequently in the United States than in other regions (Europe, Argentina/Brazil, Australia/New Zealand/Canada). By contrast, PCI and GP IIb/IIIa inhibitors were used more frequently in the United States than in other regions. PCI, GP IIb/IIIa inhibitors and calcium-channel blockers were used more frequently ($P<0.01$) in teaching hospitals and hospitals with on-site catheterization facilities compared with non-teaching hospitals and those without catheterization facilities. By comparison, LMWH was used less frequently ($P<0.0001$) in teaching hospitals and in sites with a cath lab. At discharge, a higher percentage of patients received ACE inhibitors in hospitals without access to a cath lab ($P<0.0001$). The use of statins and beta-blockers was lower in non-teaching hospitals and in centres without a cath lab ($P<0.0001$). The use of antiplatelet agents and anticoagulants was lower in non-teaching than teaching hospitals ($P<0.0001$).

When stratified according to type of ACS, calcium-channel blockers were used most frequently in UA patients (Figure 1). Forty-seven percent of STEMI patients received thrombolytic therapy and 18% underwent primary PCI. LMWH was used most often in NSTEMI patients and UFH in STEMI patients (Figure 1).

The highest rates of death and reinfarction were seen in patients with an MI (Figure 2). No differences were observed in these rates when analyzed by hospital type (teaching/non-teaching; cath lab/no cath lab).

Figure 1.

Treatment stratified by baseline condition



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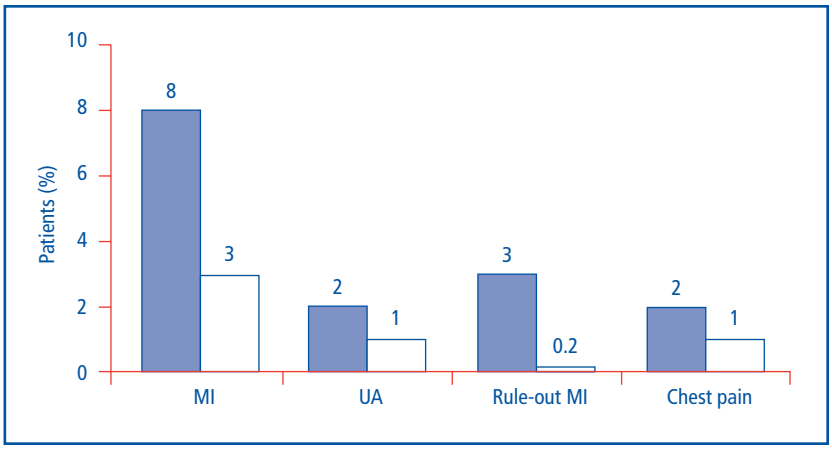

Figure 2.
Rates of death and reinfarction according to final diagnosis

Discussion

The results from this study reveal differences in the management of STEMI, NSTEMI and UA patients according to type of hospital and geographic location. Over 90% of patients received an antiplatelet agent regardless of type of ACS, a result that is in line with current treatment guidelines.[2,3] LMWH was used more frequently in non-teaching hospitals and in those without catheterization facilities. However, this pattern may change as data emerge supporting the role of LMWH in PCI and with GP IIb/IIIa inhibitors.[4,5]

When analyzed by baseline condition (STEMI, NSTEMI and UA), beta-blockers were used consistently across the three groups and thrombolytic therapy was used primarily in STEMI patients. In accordance with current guidelines,[3] LMWH was used most often in NSTEMI patients. Of note, UFH was used more frequently than LMWH in all three groups despite clinical trial data demonstrating the superior efficacy of enoxaparin over UFH.[6,7]

In the GRACE study the overall hospital death rate for STEMI was 7%, which is slightly lower than the 9% reported in the NRMI 3 study.[8] The results from NRMI 1, 2 and 3 showed a gradual decline in the hospital mortality rate during the 1990s and the results from this study lend further support to this finding.[8] The hospital mortality rates for NSTEMI and UA in the present study (6% NSTEMI, 3% UA) are similar to those reported in the OASIS registry (5%).[9]

At discharge ACE inhibitors were prescribed more frequently in hospitals without access to a cath lab compared to those with access. Beta-blockers, statins and GP IIb/IIIa inhibitors were prescribed more frequently in teaching hospitals and sites with access to a cath lab compared with non-teaching hospitals and those without a cath lab. The low rate of use of GP IIb/IIIa inhibitors in non-teaching hospital and sites without a cath lab may reflect the fact that this therapy is best established in the setting of PCI.

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