

## GRACE Risk Score vs TIMI Risk Score

Luiza Rossi, Eduardo Maffini da Rosa, Marina Bertoni Guerra

Universidade de Caxias do Sul - UCS, Caxias do Sul, RS - Brazil

### Dear Editor,

Our group of coronary artery disease studies read and discussed with interest the article by Correia et al<sup>1</sup>. Referring to the study, we would like to know the authors' opinion on the following: 1) In our clinical practice, we have the impression

### Keywords

Acute coronary syndrome; myocardial infarction; GRACE; TIMI.

that the evolution of patients no longer reflects the natural history of the disease, but the therapeutic potential of the intervention, i.e., the occurrence of death or acute myocardial infarction (AMI) meets the quality and the conditions of the treatment than those aspects of the natural history of the disease<sup>2</sup>; 2) unstable angina and acute myocardial infarction are diseases with different prognoses, and because of that, we find that they could not be placed in the same sample group. Finally, with respect to the score, we think that, the way it was applied in this study, it reflects much more the risk of reinfarction than the risk of developing infarction from a chest pain referred to an emergency center<sup>3,4</sup>.

### Mailing address: Luiza Rossi •

Rua Francisco Getúlio Vargas, 1130 - Petrópolis - 95070-560 - Caxias do Sul, RS - Brazil

E-mail: rossiluiza@hotmail.com, marina.guerra@hotmail.com

Manuscript received July 22, 2010; revised manuscript received July 22, 2010; accepted August 17, 2010.

## References

1. Correia LC, Freitas R, Bittencourt AP, Souza AC, Almeida MC, Leal J, et al. Valor prognóstico do escore de risco GRACE versus escore de Risco TIMI em síndromes coronarianas agudas. *Arq Bras Cardiol.* 2010;94(5):613-9.
2. Anderson JL, Adams CD, Antman EM, Bridges CR, Califf RM, Casey DEJ, et al. ACC/AHA 2007 Guidelines for the Management of Patients With Unstable Angina/Non-ST-Elevation Myocardial Infarction: a Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines for the Management of Patients With Unstable Angina/Non-ST-Elevation Myocardial Infarction) Developed in Collaboration with the American College of Emergency Physicians, the Society for Cardiovascular Angiography and Interventions, and the Society of Thoracic Surgeons Endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation and the Society for Academic Emergency Medicine. *J Am Coll Cardiol.* 2007;50(7):e1-157.
3. Antman EM, Cohen M, Bernink PJ, McCabe CH, Horacek T, Papuchis G, et al. The TIMI risk score for unstable angina/non-ST elevation MI: a method for prognostication and therapeutic decision making. *JAMA.* 2000;284(7):835-42.
4. Lyon R, Morris AC, Caesar D, Gray S, Gray A. Chest pain presenting to the emergency department--to stratify risk with GRACE or TIMI? *Resuscitation.* 2007;74(1):90-3.

## Authors' response

### Dear Sirs,

In the Letter to the Editor section, Rossi et al. suggest that the likelihood of recurrent cardiovascular outcomes in patients with acute coronary syndromes is determined by the therapeutic strategies used, which do not influence the clinical picture on the risk of subsequent events. This proposal leads us to the deterministic thinking that properly applied therapies prevent, universally, the incidence of cardiovascular events in this clinical setting. However, this is not the reality observed in cohort studies that evaluate the prognosis of patients with acute coronary syndromes. For example, in the

validation cohorts of TIMI and GRACE scores, despite the use of contemporary therapies of proven benefit, the risk of recurrent ischemic events occurred in proportion to the result of risk scores<sup>1,2</sup>. Furthermore, the reasoning that the patients' outcome depends entirely on the treatment leads us to believe that maximum and uniform therapeutic strategies should be implemented. However, this thinking goes beyond the paradigm of personalized medicine, in which the therapy should be individualized according to patient's baseline risk. In fact, the absolute risk reduction from therapy is proportional to the clinical probability of the event to be prevented. This probability is estimated exactly by the patient's clinical characteristics, which are usually grouped in multivariate models in the form of scores. Therefore, these multivariate

models are useful not only as prognostic markers but also as a form of choosing an individualized therapeutic strategy. In this context, considering that antithrombotic and interventional strategies reduce the risk of recurrent ischemia and increase the risk of hemorrhagic events, clinical decision trees should be used to weigh the risk-benefit ratio of the therapies indicated.

While reducing the risk of recurrent ischemia, antithrombotic and interventional strategies also increase the risk of hemorrhagic events<sup>3</sup>. Because of that, clinical decision trees should be used to weigh the risk-benefit ratio of therapies proposed. To this purpose, the risk estimate by prognostic scores represents an important component of clinical reasoning.

Later on, Rossi et al. argue that unstable angina and infarction are heterogeneous conditions and could not be studied together. At first, we must remember that the type of infarction considered in the study concerned was the one without ST-segment elevation. According to scientific evidence, the definition of myocardial infarction by elevated markers of myocardial necrosis is just one variable among many risk predictors. In the multivariate analysis of the

GRACE registry, for example, the presence of elevated markers of myocardial necrosis represents a variable with smaller predictive power than the presence of characteristics such as ST segment deviation, Killip > 1, hypotension and age > 50 years<sup>2</sup>. This demonstrates that the admission diagnosis (unstable angina or myocardial infarction without ST elevation) does not significantly different patients' prognosis. For this reason, virtually all observational and interventional studies include, at the same time, these two clinical conditions.

Finally, Rossi et al. argue that the scores are better applied to the scenario of acute coronary syndromes for patients with chest pain in the emergency room. We agree with that statement, since the scores derived from populations with the first clinical condition<sup>1,2</sup>. Therefore, our study was restricted to patients with a well-characterized condition, such as acute coronary syndromes without ST-segment elevation. That is, the inclusion criteria for this study limited the target population to individuals with objective evidence of ischemia, as described in the methodology. Thus, our conclusions limited to patients with acute coronary syndromes and should not be extrapolated to the general scenario of an acute chest pain.

## References

1. Antman EM, Cohen M, Bernink PJ, McCabe CH, Horacek T, Papuchis G, et al. The TIMI risk score for unstable angina/non-ST elevation MI: a method for prognostication and therapeutic decision making. *JAMA*. 2000;284(7):835-42.
2. Granger CB, Goldberg RJ, Dabbous O, Pieper KS, Eagle KA, Cannon CP, et al. Predictors of hospital mortality in the global registry of acute coronary events. *Arch Intern Med*. 2003;163(19):2345-53.
3. Subherwal S, Bach RG, Chen AY, Gage BF, Rao SV, Newby LK, et al. Baseline risk of major bleeding in non-ST-segment-elevation myocardial infarction: the CRUSADE (Can Rapid risk stratification of Unstable angina patients Suppress ADverse outcomes with Early implementation of the ACC/AHA Guidelines) bleeding score. *Circulation*. 2009;119(14):1873-82.