Validation of the Zwolle score for selection of very low-risk STEMI patients treated with primary angioplasty

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Background: The Zwolle risk score was designed to stratify the actual in-hospital mortality risk of ST-elevation myocardial infarction (STEMI) patients treated with primary percutaneous coronary intervention (p-PCI) but, also, for decision-making related to patients location in an intensive care unit or not. Since the GRACE score continues being the gold-standard for individual risk assessment in STEMI in most institutions we assessed the specificity of both scores for in-hospital mortality.

Methods: We assessed the accuracy of Zwolle risk score for in-hospital mortality estimation as compared to the GRACE score in all patients admitted for STEMI in 3 tertitary hospitals. Patients with Zwolle risk score <3 would qualify as "low risk", 3–5 as "intermediate risk" and ≥ 6 as "high risk". Patients with GRACE score <140 were classified as low-risk. Specificity, sensitivity and classification were assessed by ROC curves and the area under the curve (AUC).

Results: We included 4,446 patients, mean age 64.7 (13.6) years, 24% women and 39% with diabetes. Mean GRACE score was 157.3 (4.9) and Zwolle was 2.8 (3.3). In-hospital mortality was 10.6% (471 patients). Patients who died had higher GRACE score (218.4±4.9 vs. 149.6±37.5; $p<0.001$) and Zwolle score (7.6±4.3 vs. 2.3±2.18; $p<0.001$); a statistically significant increase of in-hospital mortality risk, adjusted adjusted by age, gender and revascularization, was observed with both scores (figure). A total of 1,629 patients (40.0%) were classified as low risk by the GRACE score and 2,962 (66.6%) by the Zwolle score; in-hospital mortality was 1.6% and 2.7%, respectively. Moreover, the was a significant increase of in-hospital mortality rate according to Zwolle categories (2.7%; 13.0%; 41.6%)The AUC of both score was the same (p=0.49) but the specificity of GRACE score <140 was 43.1% as compared to 72.6% obtained by Zwolle score <3; patients accurately classified was also lower with the GRACE score threshold (48.8% vs. 73.7%).

Conclusions: Selection of low-risk STEMI patients treated with p-PCI based on the Zwolle risk score has higher specificity than the GRACE score and might be useful for the care organization in clinical practice.