**Abstract:**

A cardio-metabolic score predicts long-term all-cause mortality after acute coronary syndrome

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Background: If it is well known that "metabolic markers" are strong predictors of outcome in stable coronary artery disease, few data are available about their prognostic power "early" after an acute coronary syndrome (ACS).

Purpose: Aim of the present study was to assess the prognostic power of an early determination of metabolic markers after an ACS and to develop a "cardio-metabolic" score for the prediction of all-cause mortality.

Methods: A model was derived from a cohort of 510 patients (pts), admitted to an in-hospital cardiac rehabilitation program after an ACS; the model was then validated in an other similar cohort of 510 pts. A Cox regression analysis was used to identify independent prognostic predictors for 3-year mortality. A ROC analysis was used to identify the best cut-off of each independent marker, then points were assigned to each predictor by multiplying the regression coefficient by 10 and rounding to nearest integer, and a mortality score was developed. The predictive model based on this score was evaluated by a ROC analysis and the areas under the curves were calculated in both the derivation and validation cohorts.

Results: Main characteristics of the derivation cohort were age 64 ± 12 years, male gender in 75%, mean left ventricular ejection fraction 51 ± 11 %, revascularization in 80%; hypertension, smoking, diabetes and chronic obstructive pulmonary disease were present in the history in 301 (59%), 298 (58%), 107 (21%) and 33 (6%) respectively. At the cardiac rehabilitation admission, all patients received blood tests, in average 12 days after the ACS symptom onset. At a median follow-up of 3 years, all cause mortality was 8.6%.

A Cox regression analysis identified uric acid (HR 1.19, p=0.045), LDL-cholesterol (HR 1.016, p=0.017), age (HR 1.063, p=0.000) and LVEF (HR 0.950, p=0.000) as independent predictors of mortality. The best cut-off values were then identified and the following points were assigned to each variable in order to develop a predictive model: uric acid =7 mg/dl (7 points), LDL-cholesterol >102 mg/dl (11 points), age > 67 years (15 points) and LVEF <52% (9 points). The model showed an area under the curve of 0.811 (CI 0.744-0.878, p=0.000). In the validation cohort, the area under the curve was 0.744 (CI 0.691-0.798, p=0.000). The mortality rates in the derivation and validation cohorts were 2% and 1% in pts with a score of 0 to 11, 10% and 17% in pts with a score of 12 to 24 and 31% in both cohorts in pts with a score ≥25.

Conclusion: Seric levels of uric acid and LDL-cholesterol, early evaluated after an ACS, are strong predictors of long-term all-cause mortality, independent of age and LVEF. A "cardio-metabolic" score is useful for prediction of all-cause mortality after ACS and an aggressive management of metabolic risk early after ACS is advisable.