

A Novel, Biomarker-Based Prognostic Score in Acute Ischemic Stroke: the CoRisk Score

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Objective: We aimed to derive and externally validate a copeptin-based, parsimonious score, to predict unfavorable outcome 3 months of an acute ischemic stroke (AIS).

Background: Early and accurate outcome prognostication in acute ischemic stroke can individualize counseling of patients and relatives. Copeptin plasma levels measured upon admission to the emergency room were associated with disability and mortality at 3 months. Copeptin is a promising biomarker that may, as part of a prognostic score, contribute valuable information to outcome prediction in acute ischemic stroke.

Design/Methods: The derivation cohort consisted of patients with AIS enrolled prospectively at the University Hospital of Basel, Switzerland. The validation cohort was prospectively enrolled after the derivation cohort at the University Hospitals of Bern and Basel, Switzerland, as well as Frankfurt a.M., Germany. The score components were: copeptin levels, age, NIHSS, and recanalization therapy ("CoRisk Score"). Copeptin levels were measured in plasma drawn within 24 hours of AIS, and before any recanalization therapy. The primary outcome of disability and death at 3 months was defined as modified Rankin scale 3-6.

Results: Overall, 1102 patients were included in the analysis; the derivation cohort contributed with 319 patients, the validation cohort with 783. An unfavorable outcome was observed among 436 patients (40%). For the 3-month prediction of disability and death, the CoRisk Score was well calibrated in the validation cohort, where the area under the receiver operating characteristic curve was 0.819 (95%-confidence interval [CI]: 0.787-0.849). The calibrated CoRisk-Score correctly classified 75% of patients (95%-CI: 72%-78%). The net reclassification index between the calibrated CoRisk-Score with and without copeptin was 46% (95%-CI: 32%-60%).

Conclusions:

The biomarker-based CoRisk-Score for the prediction of disability and death was externally validated, well calibrated, and performed better than the same score without copeptin.