Improvement of outcome prediction of hospitalized patients with COVID-19 by a dual marker strategy using high-sensitive cardiac troponin I and copeptin

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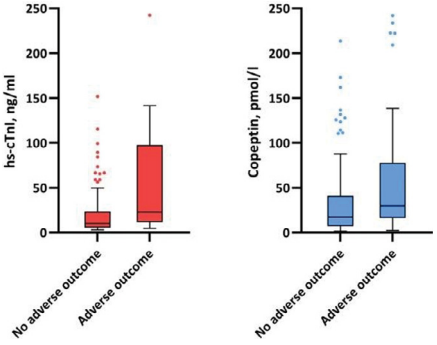
Background: COVID-19 has been associated with a high prevalence of myocardial injury and increased cardiovascular morbidity. Copeptin, a marker of vasopressin release, has been previously established as a risk marker in both infectious and cardiovascular disease.

Purpose: Investigate the prognostic impact of copeptin and high-sensitive cardiac troponin I (hs-cTnI) in COVID-19.

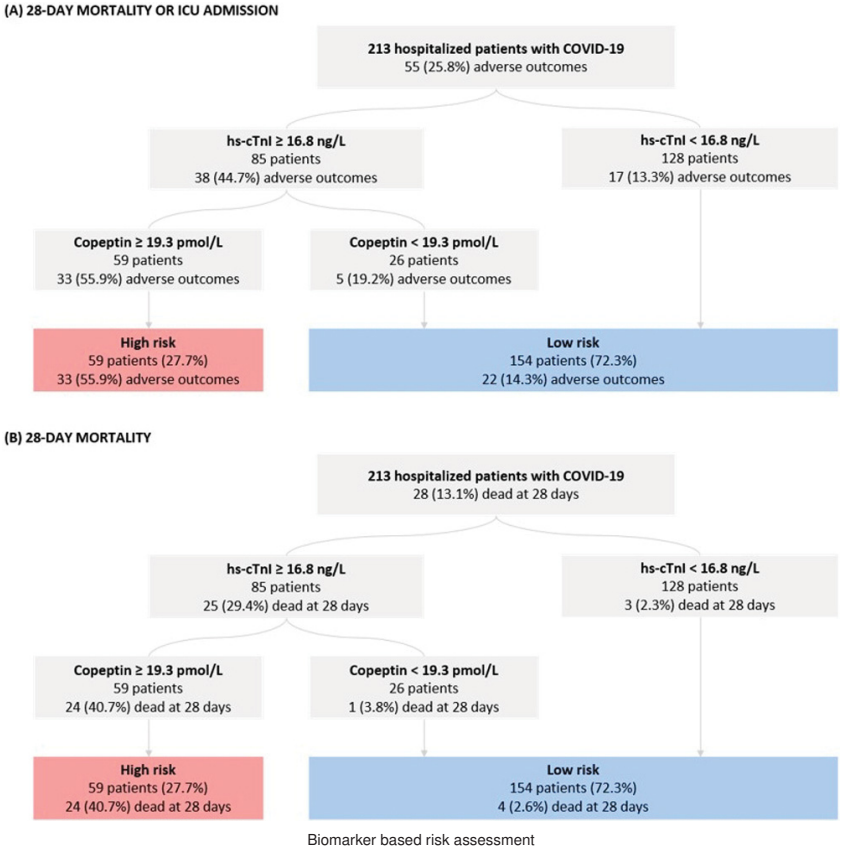
Methods: This prospective, observational study of patients with laboratory-confirmed COVID-19 infection was conducted from June 6th to November 26th, 2020 in a tertiary care hospital. Copeptin and hs-cTnI levels on admission were collected and tested for their association with the primary composite endpoint of ICU admission or 28-day mortality.

Results: A total of 213 eligible patients with COVID-19 were included of whom 55 (25.8%) reached the primary endpoint. Median levels of copeptin and hs-cTnI at admission were significantly higher in patients with an adverse outcome (Copeptin 29.6 pmol/L, [IQR, 16.2–77.8] vs 17.2 pmol/L [IQR, 7.4–41.0] and hs-cTnI 22.8 ng/L [IQR, 11.5–97.5] vs 10.2 ng/L [5.5–23.1], P<0.001 respectively). ROC analysis demonstrated an optimal cut-off of 19.6 pmol/L for copeptin and 16.2 ng/L for hs-cTnI and an increase of either biomarker was significantly associated with the primary endpoint. The combination of raised hs-cTnI and copeptin yielded a superior prognostic value to individual measurement of biomarkers and was a strong prognostic marker upon multivariable logistic regression analysis (OR 4.274 [95% CI, 1.995–9.154], P<0.001). Addition of copeptin and hs-cTnI to established risk models improved C-statistics and net reclassification indices.

Conclusion: The combination of raised copeptin and hs-cTnI upon admission is an independent predictor of deterioration (ICU admission) or 28-day mortality in hospitalized patients with COVID-19.



Copeptin and hs-cTnI in COVID-19



Biomarker based risk assessment