

Homocysteine (Hcy) Assessment to Predict Outcomes of Hospitalized Covid-19 Patients: The Results of a Multicenter Study

Oliva G¹, Lugara M¹, Coppola MG¹, Tirelli P¹, Guida A¹, Bologna C¹, de Sena A¹, Madonna P¹ and Ponti G²

¹Internal Medicine, Asl Napoli1 Centro, Hospital of the sea, Naples, Italy

²Division of Clinical Pathology, Department of Surgical, Medical, Dental and Morphological Sciences with Interest in Transplant, Oncological and Regenerative Medicine, University of Modena and Reggio Emilia, Modena, Italy

Background: Hcy has been reported as a potential predictive biomarker for COVID-19 infection severity in many studies. Hyperhomocysteinemia is related to many virus infection outcomes. Recent data confirmed the value of Hcy in predicting the risk of severe pneumonia.

Materials and Methods: Our retrospective cohort study, including 313 COVID-19 hospitalized patients (female 34.8%; mean age 62 years), also included a broad panel of clinical laboratory data collected. Of the enrolled patients, 10.9% died during hospitalization.

Results and Discussion: Hcy was found to be the strongest predictor of Covid-19 critical-progression leading to death. Univariate analysis demonstrated that age (OR 1.04), Hcy (OR 1.06), and Neutrophil/Lymphocyte count ratio (OR 1.03) were significant predictors of critical progression leading to death and RBC (OR 0.68) and Lymphocytes count (OR 0.23) with benign outcome. ROC analysis indicated Hcy cut off of 16 $\mu\text{mol/L}$ for predicting COVID-19 infection outcome (sensitivity 40% and specificity 84%); patients with Hcy levels $>16 \mu\text{mol/L}$ had significantly increased risk of in-hospital mortality ($p=0.002$) both as a continuous and dichotomic value. Hcy is an effective predictive biomarker for hospitalized COVID-19 patients' outcome. Hcy may be a valuable biomarker to help clinicians to identify patients who are at higher risk for severe COVID-19 infection.

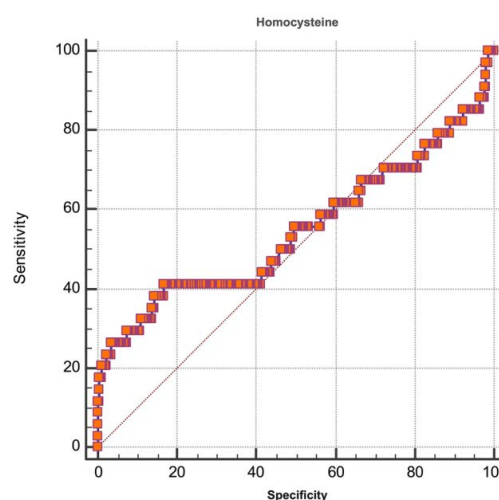


Figure 1: Receiver operating characteristic (ROC) curve for predicting in-hospital mortality using the homocysteine concentration. Area under the curve is 0.55 (cut-off: >16.4 , Se: 41%, Sp: 83%).

References

- 1 Ponti G, Ruini C, Tomasi A (2020) Homocysteine as a potential predictor of cardiovascular risk in patients with COVID-19. *Med Hypotheses* 143: 109859.
- 2 Ponti G, Maccaferri M, Ruini C, Tomasi A, Ozben T (2020) Biomarkers associated with COVID-19 disease progression. *Crit Rev Clin Lab Sci* 57: 389-399.