

PREDICTING COVID-19 ACUTE KIDNEY INJURY (AKI): THE ROLE OF URINARY BIOMARKERS. BERGAMO ICU EXPERIENCE.

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Background: AKI is common in patients affected by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), occurring approximately in 20-40% of cases(1) and it is independently correlated with mortality. Urinary biomarkers (tissue inhibitor of metalloproteinases-2 and insulin-like growth factor binding protein 7) measured by Nephrocheck® (NC) may play a role in early AKI detection(2).

Aim: evaluate whether NC is able to predict the development of AKI in SARS-CoV-2 patients.

Methods: We prospectively enrolled seventeen mechanically ill ventilated SARS-CoV-2 patients, admitted to our ICU between March and April 2020. NC was performed at two time-points: at 4-6 hour and at 24 hours after ICU admission. NC > 0.3 and ≥ 2 defined a high or highest risk of development AKI in the following 12 hours, respectively(3). Serum creatinine, urine output, central venous pressure (CVP) were collected daily for 7 days. AKI was defined using full Kidney Disease Improving Global Outcomes (KDIGO) criteria. The statistical analysis was made using the Mann-Whitney test.

Results: Twelve patients and two patients had NC value > 0,3 and ≥ 2 at ICU first sample, respectively. Four patients (23%) developed AKI and two patients needed CRRT. In four patients (23%) NC values normalized at 24 h. A NC value at admission ≥ 2 has a strong correlation with the development of AKI and a progression to AKI stage ≥ 2 ($p = 0,02$). Patients with NC > 0,3 at admission have central venous pressure (CVP) values higher than patients with NC < 0,3 ($p < 0,05$).

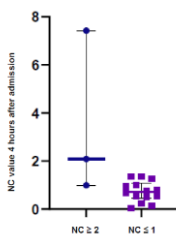


Fig. 1

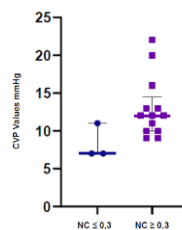


Fig. 2:

Conclusion: Although a small study population, our data suggest that a NC value ≥ 2 at ICU admission is associated to a high risk of AKI. High CVP levels are associated to higher levels of NC, suggesting a role of high CVP in predicting AKI risk.

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2. Fanelli V, Fiorentino M, Cantaluppi V, Gesualdo L, Stallone G, Ronco C, et al. Acute kidney injury in SARS-CoV-2 infected patients. Critical Care. 2020.
3. Bihorac A, Chawla LS, Shaw AD, Al-Khafaji A, Davison DL, DeMuth GE, et al. Validation of cell-cycle arrest biomarkers for acute kidney injury using clinical adjudication. Am J Respir Crit Care Med. 2014;

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