Analysis of lymphocyte subpopulations and circulating immunoglobulin levels in patients with critical COVID-19 disease: preliminary data from a prospective single-center cohort study.

Dott.ssa GIULIA CANTÙ (1), Dott.ssa ELEONORA BALZANI (1), Dott. DAVIDE LOMBARDO (1), Dott.ssa ALICE GIACCONE (1), Dott.ssa GIULIA D'ANTONIO (1), Dott.ssa VALENTINA SANNA (1), Dott.ssa FRANCESCA RUMBOLO (2), Dott. GABRIELE SALES (1)(3), Dott. UMBERTO SIMONETTI (1)(3), Prof. VITO FANELLI (1)(3), Dott.ssa GIORGIA MONTRUCCHIO (1)(3), Prof. LUCA BRAZZI (1)(3)

(1) Department of Surgical Sciences, University of Turin, Italy, Italia.

(2) Clinical Microbiology and Virology Laboratory, Department of Laboratory Medicine, 'Città della Salute e della Scienza' Hospital, Turin, Italy,, Italia.

(3) Anestesia e Rianimazione 1U, Department of Anesthesia, Intensive Care and Emergency, 'Città della Salute e della Scienza' Hospital, Turin, Italy, Italia.

Argomento: COVID-19

BACKGROUND: The ongoing studies on immunity in COVID-19 are to date inconclusive. Lymphocyte subpopulations and circulating levels of immunoglobulins (IgA, IgM e IgG) might represent a possible host's immunological response to viral lung damage.

OBJECTIVE: To compare the effectiveness of lymphocyte subpopulations and immunoglobulin levels to standard biomarkers and MR-proADM in predicting mortality in COVID-19-patients.

METHODS: Between March 2020 and June 2021, all adult patients hospitalized for SARS-CoV-2 pneumonia in the ICUs of "Città della Salute e della Scienza" Hospital, Turin, were enrolled. All biomarkers were assessed within 48 hours of admission ("predictive value") and on days 3 and 7. Univariate analysis and generalized linear model for repeated measures were used to assess any potential statistical significance.

RESULTS: 209 critical COVID-19-patients were enrolled (SOFA 7, IQR 4-9; SAPS II 52, IQR 41-59; MuLBSTA 11, IQR 9-13). ICU and overall mortality were 55.5% and 60.8%, respectively. The 64.1% of patients contracted a superinfection during ICU stay, 9.6% of them within the first 48 hours from admission, 29.2% of them presented septic shock. MR-proADM, PCT, LDH, D-dimer, NT-proBNP, myoglobin, troponin, neutrophil and lymphocyte count were significantly different between survivors and non-survivors. Lymphocyte subpopulations, and immunoglobulin have shown no statistical significance (Table 1). In the analysis of trends, statistical significance emerged only for MR-proADM (T0 p= 0.0002; T3 p <.0001; T7 p <.0001). When assessing lymphocyte subpopulations and immunoglobulin levels trends in the first week of ICU-stay, no statistically significant values were found.

CONCLUSIONS: In critical COVID-19-patients, conventional biomarkers may stratify mortality risk, and MR-proADM represents the best biomarker. On the contrary, in our cohort, levels of IgA, IgM e IgG, and lymphocyte subpopulations (except for natural killers) were not correlated with mortality. These findings need confirmation in larger studies, with a less severe comparison population, and

considering potentially confounding factors (namely superinfections).