**Clinical performance of paraoxonase-1-related variables and novel markers of inflammation in coronavirus disease-19. A machine learning approach**

**Abstract:** SARS-CoV-2 infection produces a response of the innate immune system causing

oxidative stress and a strong inflammatory reaction termed ‘cytokine storm’ that is one of the

leading causes of death. Paraoxonase-1 (PON1) protects against oxidative stress by hydrolyzing lipoperoxides. Alterations in PON1 activity have been associated with pro-inflammatory mediators such as the chemokine (C-C motif) ligand 2 (CCL2) and the glycoprotein galectin-3. We aimed to investigate the alterations in the circulating levels of PON1, CCL2 and galectin-3 in 126 patients with COVID-19 and their interactions with clinical variables and analytical parameters.

A machine learning approach was used to identify predictive markers of the disease. For comparisons, we recruited 45 COVID-19 negative patients and 50 healthy individuals. Our approach identified a synergy between oxidative stress, inflammation and fibrogenesis in positive patients that is not observed in negative patients. PON1 activity was the parameter with the greatest power to discriminate between patients who were either positive or negative for COVID-19, while their levels of CCL2 and galectin-3 were similar. We suggest that the measurement of serum PON1 activity may be a useful marker for the diagnosis of COVID-19.