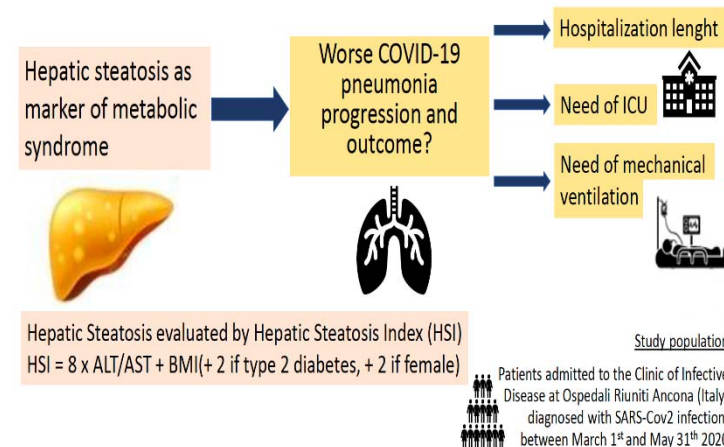**TITLE: Impact of hepatic steatosis on COVID-19 outcome**

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Research activity description: At least seven relatively large-scale case studies have reported the clinical features of patients with COVID-19 in China as summarized. These data indicate that 2–11% of patients with COVID-19 had liver comorbidities and 14–53% cases reported abnormal levels of alanine aminotransferase and aspartate aminotransferase (AST) during disease progression. Moreover, in a large cohort including 1099 patients, more severe patients had abnormal liver aminotransferase levels than did non-severe patients with disease. In a retrospective case series of 1591 consecutive patients with laboratory-confirmed COVID-19 referred for ICU admission in Lombardy, Italy, only 3% of these patients had an history of chronic liver disease while no data on transaminases values have been reported. However 68% had at least 1 comorbidity (hypertension 49%, cardiovascular disease 21%, hypercholesterolemia 18%, type 2 diabetes 17%) indicating a large prevalence of the component of the metabolic syndrome. Hepatic steatosis can be considered a hallmark of the metabolic syndrome and is characterized by specific modifications of the metabolic profile. The gold standard for the

Does preexisting metabolic syndrome condition the severity of disease in patients infected with SARS-Cov2?

Hepatic steatosis as marker of metabolic syndrome → Worse COVID-19 pneumonia progression and outcome? → Hospitalization lenght / Need of ICU / Need of mechanical ventilation

Hepatic Steatosis evaluated by Hepatic Steatosis Index (HSI)
HSI = 8 x ALT/AST + BMI(+ 2 if type 2 diabetes, + 2 if female)

Study population
Patients admitted to the Clinic of Infective Disease at Ospedali Riuniti Ancona (Italy) diagnosed with SARS-Cov2 infection, between March 1st and May 31th 2020

measurement of hepatic fat is 1H-magnetic resonance spectroscopy (1H-MRS). This system is not generally available, thus various clinical indices are increasingly used to predict steatosis including the so-called hepatic steatosis index (HSI) that might serve as surrogate parameters for liver fat content and also as rough clinical estimates of abnormal insulin sensitivity and secretion. In a preliminary report from China, patients with NAFLD had higher risk of disease progression, higher likelihood of abnormal liver function from admission to discharge and longer viral shedding time when compared with non-NAFLD subjects.

Aims

Primary aim: To evaluate if hepatic steatosis measured by HSI is associated with a more severe disease profile in patients with COVID-19 in Italy;

Secondary aim: To evaluate the association between hepatic steatosis measured by HSI and lipid concentration and composition.

Patients enrollment was finished on May 31st and clinical data are now under evaluation.

Collaborators: Cardiometabolic Risk Unit, Institute of Clinical Physiology, CNR, Pisa, Italy.