

Fatty liver disease in obese patients with COVID-19: a tale of two pandemics?

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We read with interest the recent excellent review by Barison *et al.*,¹ which described the increased risk of severe COVID-19 in patients with established cardiovascular disease (CVD) and cardiovascular risk factors. The authors reiterate the particular importance of implementing cardioprotective lifestyle measures, including weight management, in CVD patients during the COVID-19 pandemic. They also highlight the potential for statin-induced liver injury in COVID-19 patients with CVD who are undergoing treatment with specific antiviral agents. We wish to draw attention to another hepatic complication which often co-exists with CVD and which is of significance in the context of the current pandemic.

Non-alcoholic fatty liver disease, recently renamed by an international consensus panel as metabolic-associated fatty liver disease (MAFLD), affects up to 1 billion patients worldwide.² This parallels the massive global increase in central obesity which has reached pandemic proportions. Despite the recognized association between MAFLD and atherosclerotic CVD, it is frequently overlooked in the assessment and management of patients with more traditional CVD risk factors. Putative underlying mechanisms which mediate the link between fatty liver disease and CVD include endothelial dysfunction, systemic inflammation, and insulin resistance.³ Furthermore, patients with MAFLD have a worse prognosis after experiencing an acute coronary syndrome.³

A recently published review article discusses the challenges faced by patients with pre-existing chronic medical conditions, including CVD and diabetes, during the current global pandemic.⁴ These vulnerable patients are more likely to develop severe COVID-19 requiring prolonged hospitalization and intensive care management. The clinical outcomes in obese COVID-19 patients are worse, and the fatality rate is higher in this group. The authors recommend that the weight gain associated with prolonged societal lockdown measures be addressed by concerted efforts to promote healthy eating and physical activity.⁴ This is especially important in the obese population, many of whom will also have evidence of MAFLD.

A study by Zheng *et al.*⁵ found that the presence of obesity in COVID-19 patients with MAFLD predicted a six-fold increased risk of severe disease. This association was independent of the presence of diabetes, dyslipidaemia, and hypertension. It has been proposed that the mechanism of increased severity of infection in patients with

MAFLD and hepatic fibrosis may relate to an amplified cytokine storm observed in many patients with critical COVID-19 disease.⁶

While older individuals have borne the greatest burden of severe illness, some younger patients with obesity have also registered adverse outcomes from infection with SARS-CoV-2. MAFLD may be an important co-factor in the development of severe disease in the younger population. In a prospective study from China of 327 adults screened for fatty liver by computed tomography, Zhou *et al.*⁷ found by multivariable logistic regression analysis that younger patients (<60 years) with MAFLD were more likely to have severe COVID-19 than elderly patients.

The world is currently experiencing two parallel pandemics which may collide in the patient with MAFLD. We advocate for greater awareness among the cardiovascular community of the links between obesity, fatty liver disease, and severe COVID-19, and for greater investment in public health efforts which facilitate lifestyle behavioural changes in this population.

Conflict of interest: none declared.

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