The features of COVID-19 patients with detectable viral RNA in blood, the risk factors of viral RNAemia, and its influence on the prognosis remain unclear.

This is a post-hoc analysis of data prospectively collected in a randomized, controlled, open-label trial (LOTUS China, ChiCTR2000029308). A total of 199 patients aged 18 years or older with pneumonia caused by SARS-CoV-2, which was confirmed via RT-PCR with respiratory specimens were included in the LOTUS study. All the patients met the criteria of an oxygen saturation (SaO2) of 94% or less while they were breathing ambient air or PaO2/FiO2 at or below 300 mg Hg on enrollment. Plasma specimens were collected on day 1, 5, 10, 14, 21, 28 after enrollment.

In total, 192 severe COVID-19 patients were included in this study. 36.9% of them showed detectable SARS-CoV-2 viral RNA in plasma during hospitalization. Baseline viral load in throat swabs and anal swabs were positively associated with viral load in plasma. Disease severity at baseline (odds ratio 2.20, 95%CI 1.15-4.20; p=0.017) and prior corticosteroids therapy for underlying diseases (4.56, 1.10-18.94; p=0.037) were risk factors for developing viral RNAemia in severe COVID-19 patients. Severe and prolonged lymphopenia, dysfunction of coagulation characterized by high level of D-dimer, and multi-organ dysfunction including ARDS, acute kidney injury and acute liver injury, were more prominent in the patients with viral RNAemia compared with those without. Compared with COVID-19 patients without viral RNAemia, those with viral RNAemia have higher risk for invasive mechanical ventilation support (6.87, 2.24-21.08; p<0.001), ICU admission (7.80, 2.61-23.31; p<0.001), and in-hospital death (4.48, 1.73-11.62; p<0.001).

### References