Supplemental Digital Content

Supplemental Text 1. Patient Management and Study Sites

The study was conducted in the ICUs of Vancouver General and Surrey Memorial Hospitals in metropolitan Vancouver, British Columbia, Canada, both of which are affiliated with the University of British Columbia and function in a closed ICU model with fellowship-certified intensivists in attendance. Patients with COVID-19 were managed according to guidelines from the British Columbia COVID-19 therapeutics consortium and aligned with international guideline recommendations from the Surviving Sepsis Campaign.14 The primary sedative of choice was intravenous propofol with second line agents including intravenous narcotics and/or benzodiazepines. Intravenous norepinephrine was the primary vasopressor with secondary choices being vasopressin or epinephrine. Patients underwent radial arterial cannula insertion as part of routine care to enable hemodynamic monitoring, and serial sampling of arterial blood for biomarker measurements. Mechanical ventilation settings were titrated to achieve normoxemia (arterial oxygen tension 80 to 100mmHg) and normocapnia (arterial carbon dioxide tension 35 to 45mmHg) unless a diagnosis of acute respiratory distress syndrome (ARDS) was denoted in accordance with the Berlin criteria15, in which case lung protective ventilation was used (tidal volume 6ml/kg). Anti-pyrexial therapy using enteral administration of acetaminophen was used to maintain core body temperature (monitored with esophageal or bladder temperature probes) < 38.5oC. A normal sodium concentration ([Na+] 135 – 145mmol/L) and head of bed elevation of 30o was maintained at all times.

Supplemental Figure 1. Association of neurological biomarkers and PaO2:FiO2 ratio and ARDS diagnosis in COVID-19 patients. A-D) Correlations between GFAP, t-tau, UCH-L1 and NF-L concentrations and subjects' admission PaO2:FiO2 ratio. Results of Spearman rank correlation test are displayed. **E-F)** Upon study admission, 11 patients with COVID19 were diagnosed with ARDS vs 16 who were not. Graph displays plasma levels of GFAP, tau, UCH-L1 and NF-L dichotomized ARDS diagnosis. Median with interquartile ranges shown. Significant difference determined by Mann Whitney U-test with all significant p-values displayed.