CARDIOVASCULAR FLASHLIGHT

doi:10.1093/eurheartj/ehaa637

Acute kidney injury associated with COVID-19: a prognostic factor for pulmonary embolism or co-incidence?

Seyed Soheil Saeedi Saravi[1,2,†], Massimo Barbagallo [2,†], Martin F. Reiner[2], Hans R. Schmid[2], Jonas Rutishauser[2,3], and Jürg H. Beer[1,2*]

[1]Center for Molecular Cardiology, University of Zurich, Schlieren, Switzerland; [2]Department of Internal Medicine, Cantonal Hospital Baden, Baden, Switzerland; and [3]Department of Endocrinology, Diabetes, and Metabolism, University Hospital Basel, University of Basel, Switzerland

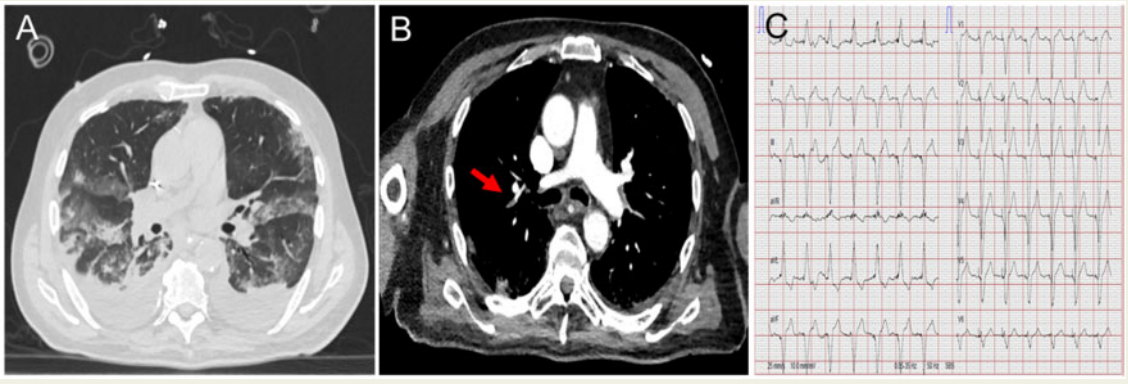
* Corresponding author. Department of Internal Medicine, Cantonal Hospital Baden, Im Ergel 1, 5404 Baden, Switzerland. Email: hansjuerg.beer@ksb.ch

†These authors contributed equally to this work.

Supplementary Data

An 81-year-old gentleman presented with fever (39.1°C), cough, dysuria, and urinary tract infection, which warranted antibiotic therapy. Medical history included insulin-dependent type 2 diabetes mellitus, arterial hypertension, and third-degree atrioventricular block with an implanted pacemaker. The patient was intubated and required mechanical ventilation for severe respiratory failure (Horowitz index of 64.2 mmHg) 6 days after hospitalization. SARS-CoV-2 polymerase chain reaction (PCR) test on nasopharyngeal swabs was positive and chest computed tomography (CT) illustrated bilateral ground-glass opacities (*Panel A*). Laboratory tests showed a remarkable increase in the inflammatory cytokine interleukin-6 (270.6 pg/mL) and C-reactive protein (CRP; 222.7 mg/L). In the second week, he developed acute kidney injury (AKI) [creatinine, 296 µmol/L; blood urea nitrogen (BUN), 14.6 µmol/L, and estimated glomerular filtration rate (eGFR) 16 mL/min/1.73 m^2], and consequently continuous haemodialysis was initiated. Fifteen days later, D-dimer levels were strikingly elevated (15 293 µg/L), and CT pulmonary angiography revealed segmental pulmonary embolism (PE) in the right upper lobe (*Panel B*) without signs of right ventricular failure (Supplementary material online, *Video 1*). ECG showed new onset of atrial fibrillation (*Panel C*). Anticoagulation with unfractionated heparin was implemented. The patient remained in the intensive care unit until recovery of pulmonary function, but dialysis continued for 24 days to be prepared for discharge.

Although causes of PE and AKI are multifactorial, common mechanisms such as the proinflammatory cytokine storm, endothelial injury, hypercoagulability, and direct infection of both endothelial and epithelial cells in the kidney may underlie a prognostic and predictive role for AKI for PE in patients with severe COVID-19.



Conflict of interest: The authors have submitted their declaration which can be found in the article Supplementary material online.

Supplementary material is available at *European Heart Journal* online.