UKE Paper of the Month Januar 2022

Multi-organ assessment in mainly non-hospitalized individuals after SARS-CoV-2 infection: The Hamburg City Health Study COVID programme

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ABSTRACT:

Aims Long-term sequelae may occur after SARS-CoV-2 infection. We comprehensively assessed organ-specific functions in individuals after mild to moderate SARS-CoV-2 infection compared with controls from the general population.

Methods and results Four hundred and forty-three mainly non-hospitalized individuals were examined in median 9.6 months after the first positive SARS-CoV-2 test and matched for age, sex, and education with 1328 controls from a population-based German cohort. We assessed pulmonary, cardiac, vascular, renal, and neurological status, as well as patient-related outcomes. Bodyplethysmography documented mildly lower total lung volume (regression coefficient −3.24, adjusted P=0.014) and higher specific airway resistance (regression coefficient 8.11, adjusted P=0.001) after SARS-CoV-2 infection. Cardiac assessment revealed slightly lower measures of left (regression coefficient for left ventricular ejection fraction on transthoracic echocardiography −0.93, adjusted P=0.015) and right ventricular function and higher concentrations of cardiac biomarkers (factor 1.14 for high-sensitivity troponin, 1.41 for N-terminal pro-B-type natriuretic peptide, adjusted P≤0.01) in post-SARS-CoV-2 patients compared with matched controls, but no significant differences in cardiac magnetic resonance imaging findings. Sonographically non-compressible femoral veins, suggesting deep vein thrombosis, were substantially more frequent after SARS-CoV-2 infection (odds ratio 2.68, adjusted P,0.001). Glomerular filtration rate (regression coefficient −2.35, adjusted P=0.019) was lower in post-SARS-CoV-2 cases. Relative brain volume, prevalence of cerebral microbleeds, and infarct residuals were similar, while the mean cortical thickness was higher in post-SARS-CoV-2 cases. Cognitive function was not impaired. Similarly, patient-related outcomes did not differ.

Conclusion Subjects who apparently recovered from mild to moderate SARS-CoV-2 infection show signs of subclinical multiorgan affection related to pulmonary, cardiac, thrombotic, and renal function without signs of structural brain damage, neurocognitive, or quality-of-life impairment. Respective screening may guide further patient management.

STATEMENT:

Not only is this paper an example for a large interdisciplinary UKE-project, we also analysed sequelae of mild to moderate SARS-CoV-2 infections in a comprehensive multi-organ assessment for the first time.

BACKGROUND:

The study is based on the interdisciplinary Hamburg City Health Study and was carried out with the support of the Free and Hanseatic City of Hamburg with the participation of more than 10 UKE clinics and institutes