Supplementary Material

Resilience of Alzheimer's Disease to COVID-19

Supplementary Material 1. RT-PCR methods of COVID-19 diagnosis.

Individuals confirmed to have COVID-19 by SARS-CoV-2 real-time reverse transcriptase–polymerase chain reaction (RT-PCR) were eligible for inclusion in this study. Data were collected at Wuhan Red Cross Hospital that provided care for these patients. Data from electronic health records were summarized using a standardized data collection form. Two researchers independently reviewed the data collection forms for accuracy.

Specimens (nasopharyngeal swabs) were collected at multiple time points in the first 2 weeks following study enrollment and tested by RT-PCR for the presence of SARS-CoV-2. After collection, the throat swabs were placed into a collection tube with 200 μL of virus preservation solution, and total RNA was extracted within 2 h using the respiratory sample RNA isolation kit (Union hospital, Tongji Medical University, Huazhong university of Science and Technology and ADICON clinical laboratory). After standing at room temperature for 30 min, the collection tube was centrifugated at 8000 rpm/min for a few seconds. The suspension was used for RT-PCR assay of SARS-CoV-2. RT-PCR assay was performed under the following conditions: incubation at 50°C for 15 min and 95°C for 15 min, 45 cycles of denaturation at 94°C for 15 s, and extending and collecting fluorescence signal at 55°C for 45 s. RT-PCR cycle threshold values were collected. A cycle threshold value (Ct-value) less than 40 was defined as a positive test result. The cycle threshold value correlates with the number of copies of the virus in a biological

sample, in an inversely proportional and exponential manner. Sequencing of PCR products of the RNA-dependent RNA polymerase (RdRp) gene were used to construct phylogenetic trees. (CoV-N-P: 5' FAM-TTGCCCCCAGCGCTTCA-BHQ1 3'; CoV-N-F: 5' TTGGGGACCAGGAACTAAT 3'; CoV-N-R: 5' GAAGGTGTGACTTCCATGC 3'; ORF1ab-P: 5' HEX-TCCCACCCAAGAATAGCATAGATGC-BHQ1 3'; ORF1ab-F1: 5' TTTAGATATATGAATTCACAGGGA 3'; ORF1a-R1: 5' ACCAACACCCAACAATTTAAT 3'; RNP-F: AGATTTGGACCTGCGAG ; RNP-R: ACTGAATAGCCAAGGTGAG; RNP-P: 5' Cy5-TCCACAAGTCCGCGCAGAG-BHQ2 3')

Supplementary Material 2. CT diagnosis methods of COVID-19.

All COVID-19 patients were from WRCH and were imaged with1-mmslice thickness CT on a Siemens SOMATOM go.Top 64 scanner (Siemens Healthineers, Suzhou, China). Scanning field of view (FOV) 413×413 mm, tube voltage 130 kV, tube current 138 mA, pitch 0.6, reconstruction layer thickness 1.5 mm. Lung window reconstruction was performed using high-resolution algorithm. After inhaling, the patient held his breath to acquire images, and the scanning range was from the lung tip to the lung bottom. All CT images were reviewed by two fellowship-trained cardiothoracic radiologists with approximately five years of experience each (FF, SH) using a viewing console. Imaging was reviewed independently and final decisions reached by consensus are reported. No negative control cases were examined. For each patient, the chest CT scan was evaluated for the following characteristics: 1) presence of ground-glass opacities, 2) presence of consolidation, 3) laterality of ground-glass opacities and consolidation, 4) number of lobes affected where either ground-glass or consolidative opacities were present, 5)

degree of involvement of each lung lobe in addition to overall extent of lung involvement measured by means of a "total severity score" as detailed below, 6) presence of nodules, 7) presence of a pleural effusion, 8) presence of thoracic lymphadenopathy (defined as lymph node size of ≥10 mm in short-axis dimension), 9) airways abnormalities (including airway wall thickening, bronchiectasis, and endoluminal secretions), 10) axial distribution of disease (categorized as no axial distribution of disease, central "peribronchovascular" predominant disease, or peripheral predominant disease), and 11) presence of underlying lung disease such as emphysema or fibrosis. Other abnormalities, including linear opacities, opacities with a rounded morphology, opacities with a "reverse halo" sign, opacities with a "crazy-paving" pattern, and opacities with intralesional cavitation, were noted. Ground-glass opacification was defined as hazy increased lung attenuation with preservation of bronchial and vascular margins, whereas consolidation was defined as opacification with obscuration of margins of vessels and airway walls. Each of the 5 lung lobes was visually scored from 0 to 5 as: 0, no involvement; 1, <5% involvement; 2, 25% involvement; 3, 26%-49% involvement; 4, 50%-75% involvement; 5, >75% involvement. The total CT score was the sum of the individual lobar scores and ranged from 0 (no involvement) to 25 (maximum involvement). The amount of time between the initial appearance of patient symptoms and the date of admission as well as the date of the initial chest CT examination was noted for each patient.