

Cerebral magnetic resonance tomography

Patients received structural MRI on a 3 T scanner (Magnetom Prisma, Siemens Medical Solutions) with a 64-channel head coil using a protocol with the following sequences: sagittal 3D T1-weighted MPRAGE before and after contrast agent administration, sagittal 3D FLAIR SPACE, axial susceptibility weighted imaging (SWI), axial proton density + T2 double echo, dynamic susceptibility contrast (DSC) perfusion imaging and diffusion mesoscopic imaging (DMI) with 61 diffusion-encoding directions and b-factors of 1000 and 2000 s/mm². Imaging was evaluated by a board-certified neuroradiologist (27 years of experience in neuroimaging). To assess atrophy voxel-based morphometry was performed (1).

Supplemental Table 1: Demographics

	Mean \pm SD [range] or N (%) all patients	Mean (SD) [range] or N (%) Subgroup of patients with ¹⁸F-FDG PET
Sex male/female	11 (36%) / 20 (64%)	5 (36%) / 9 (64%)
Age (years)	53.6 \pm 12.0 [24 – 75]	56.3 \pm 7.2 [42 - 73]
Years of education	13.6 \pm 2.6 [8 - 18]	13.2 \pm 3.0 [8 - 18]
Δ positive PCR - examination (days)	202.3 \pm 57.5 [90 – 316]	185.0 \pm 52.9 [107 - 254]
Δ positive PCR - ¹⁸ F-FDG- PET (days)		198.0 \pm 63.5 [106 - 314]

Supplemental Table 2: Clinical Characteristics

	N (%) all patients	N (%) Subgroup of patients with ¹⁸F-FDG PET
Disease severity score¹		
1	9 (29%)	3 (21%)
2	12 (39%)	6 (43%)
3	6 (19%)	2 (14%)
4	4 (13%)	3 (21%)
Degree of actual disability²		
0	0 (0%)	0 (0%)
1	19 (61%)	7 (50%)
2	3 (10%)	1 (7%)
3	9 (29%)	6 (43%)
Neurological symptoms during acute COVID-19		
Disturbed olfaction	22 (71%)	11 (79%)
Disturbed gust	26 (84%)	11 (79%)
Headache	11 (35%)	6 (43%)
Vertigo	9 (29%)	3 (21%)
Transient confusion	7 (23%)	3 (21%)
Actual neurological symptoms		
Poor attention	31 (100%)	14 (100%)
Memory impairment	31 (100%)	14 (100%)

Impaired multi-tasking	31 (100%)	14 (100%)
Word finding difficulties	27 (87%)	12 (86%)
Fatigue	24 (77%)	11 (77%)
Pre-existing conditions		
Hypertension	7 (23%)	6 (43%)
Diabetes mellitus	2 (6%)	1 (7%)
Renal insufficiency	3 (10%)	2 (14%)
Malignancy	1 (3%)	1 (7%)
Migraine	5 (16%)	3 (21%)
Depression	3 (10%)	2 (14%)
¹ Disease severity score: (1) no pneumonia; (2) pneumonia, outpatient treatment; (3) pneumonia, inpatient treatment; (4) ARDS, endotracheal ventilation at ICU ² Degree of actual disability: (0) no relevant restrictions; (1) relevant restrictions but able to work; (2) reduction of work quota necessary; (3) inability to work and restriction of daily life activities		

Supplemental Table 3: Neurocognitive test battery

Domain and corresponding single tests	All patients		Subgroup of patients with ¹⁸ F-FDG PET	
	Mean z-score ± SD	N (%) ≤ -1.5 SD	Mean z-score ± SD	N (%) ≤ -1.5 SD
Verbal Memory	-0.13 ± 0.82	2 (6.5 %)	0.04 ± 0.73	0
Hopkins Verbal Learning Test revised (HVLTR): learning (Scores)	-0.10 ± 0.84	3 (10 %)	0.149 ± 0.88	1 (7 %)
HVLTR: del. Recall (Scores)	-0.41 ± 1.11	7 (23 %)	-0.31 ± 1.02	3 (21 %)
HVLTR: recognition (Scores)	0.11 ± 0.99	4 (13 %)	0.26 ± 0.88	1 (7 %)
Visual Memory	-0.35 ± 1.14	7 (22.5 %)	-0.11 ± 0.88	1 (7.2 %)
Brief Visual Memory Test (BVMT): learning (Scores)	-0.41 ± 1.31	7 (23 %)	-0.09 ± 1.20	2 (14 %)
BVMT: del. Recall (Scores)	0.37 ± 1.22	4 (13 %)	0.21 ± 1.04	1 (7 %)
BVMT: recognition (Scores)	-0.60 ± 1.39	8 (26 %)	-0.45 ± 1.28	2 (14 %)
Processing Speed	0.48 ± 0.90	1 (3.2 %)	0.60 ± 1.06	1 (7.2 %)
Color-Word Interference reading (Time (s))	0.48 ± 0.95	1 (3 %)	0.43 ± 1.22	1 (7 %)
Color-Word Interference: naming (Time (s))	0.75 ± 1.08	2 (6 %)	0.90 ± 1.16	1 (7 %)

Symbol-Digits-Modalities Test (Time (s))	0.20 ± 1.21	2 (6 %)	0.47 (1.28)	1 (7 %)
Attention	0.85 ± 0.98	0 (0.0 %)	1.08 ± 1.05	0
Trail Making Test A (Time (s))	1.28 ± 1.75	3 (10 %)	1.96 ± 1.62	0
Digit Span forward (Scores)	0.42 ± 1.04	0 (0.0 %)	0.22 ± 1.01	0
Executive function	0.32 ± 0.74	0 (0.0 %)	0.41 ± 0.75	0
Digit Span backward (Scores)	0.17 ± 1.61	0 (0.0 %)	0.54 ± 2.16	0
Semantic fluency: animals (semantic) (Scores)	0.00 ± 0.91	2 (6 %)	-0.29 ± 0.65	0
Phonemic fluency: S-words (phonemic) (Scores)	-0.09 ± 1.11	2 (6 %)	0.21 ± 0.91	1 (7 %)
Color-Word Interference: interference (Time (s))	0.51 ± 0.74	0 (0.0 %)	0.59 ± 0.80	0
Trail Making Test B (Time (s))	1.03 ± 1.26	0 (0.0 %)	1.40 ± 1.29	0
Composite Score	0.20 ± 0.71	1 (3.2 %)	0.36 ± 0.68	0

Supplemental Table 4: Other tests

	Mean score ± SD [range]	N (%) below critical cutoff	Mean score ± SD [range]	N (%) beyond critical cutoff
Montreal Cognitive Assessment (MoCA) (norm: ≥ 26)	26.55 ± 2.19 [2 - 30]	9 (29 %)	26.80 ± 2.04 [24 - 30]	4 (29 %)
Würzburg Fatigue Inventory in Multiple Sclerosis: sum score (WEIMuS) (norm: ≤ 33)	39.77 ± 12.33 [16 - 65]	19 (61 %)	39.90 ± 13.00 [16 - 61]	8 (57 %)
WEIMuS: cognitive fatigue (norm: ≤ 17)	21.23 ± 7.17 [6 - 35]	21 (67 %)	20.60 ± 8.03 [6 - 33]	9 (64 %)
WEIMuS: physical fatigue (norm: ≤ 16)	18.47 ± 6.25 [6 - 30]	13 (42 %)	19.20 ± 5.78 [10 - 28]	7 (50 %)
Geriatric Depression Scale (GDS) (norm: ≤ 7)	3.94 ± 2.60 [0 - 10]	4 (13 %)	3.36 ± 2.24 [1 - 8]	2 (14 %)