

Supplementary Table 1: Clinical characteristics of all patients (including subjective improvement that does not necessarily reflect in a reduction of modified Rankin-scale score).

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Patient	Gender	Age at onset	Preexisting headache	Family history of headache	Neurological symptoms at onset	Therapy	mRS onset	mRS outcome	Neurological Outcome
1	F	73			Headache, aphasia	Steroids	2	2	No improvement
2	M	76	TTH	Positive	Vertigo, aphasia, disorientation, dysarthria, hemiparesis	Steroids	4	3	Improvement
3	M	17			Memory deficit, concentration problems, seizure	Steroids, plasmapheresis, rituximab, AED	3	2	Improvement
4	M	56	TTH	Positive	Memory deficit, concentration problems, seizure	Steroids, azathioprin, AED	3	2	Improvement

F 45 N/C Positive					Memory deficit, depression, vertigo, seizure	Steroids, AED, anterior temporal lobe resection left	5	2	Improvement
F 44					Memory deficit, seizure	Steroids, methotrexate, plasmapheresis, AED	3	2	Improvement
M 49 MO Positive					Memory deficit, depression, dysphagia, diplopia	Steroids, IVIG, azathioprine, AED	3	2	Improvement
M 38					Memory deficit, seizure	Steroids	3	2	Improvement
F 34 MO Positive					Memory deficit, concentration problems, emotional lability, fatigue	Steroids, plasmapheresis, azathioprine	3	3	Improvement

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M 46	N/C Positive				Concentration problems, headache, vertigo, aphasia, weakness left leg, loss of consciousness c/w seizures	Steroids	5	3	Improvement
M 78	N/K				Vertigo, weakness left leg, gait ataxia, disorientation, left hemianopia	Steroids	3		Lost of follow-up
F 77	Memory deficits	Steroids	3	2 Improvement					
M 22	Positive				Seizure, agitation, hyperkinesia, catatonia, psychosis	Steroids, immunoadsorption, rituximab, IVIG, AED	5	3	Improvement

M 58 TTH					Memory deficit, vertigo, diplopia, dysarthria, lack of energy, gait ataxia	Lost of follow-up	3		Lost of follow-up
M 56					Distal tetraparesis, upper limb neuropathic pain	Lost of follow-up	3		Lost of follow-up
M 65 TTH	Memory deficit	Steroids, IVIG	3	2 Impr					ovement
F 48 TTH Positive					Memory deficit, concentration problems, seizure	Steroids, plasmapheresis, rituximab, intratect, AED	3	3	Improvement
M 59 N/C	Memory deficit	Steroids	3	2 Improvemen					t
F 18 TTH					Memory deficit, concentration problems, seizure	Steroids, plasmapheresis, IVIG, AED	3	2	Improvement

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M 29 TTH Positive					Disorientation, aphasia, dysarthria, hyperkinesia, psychosis	Steroids, rituximab, azathioprine, IVIG	3	2	Improvement
M 65 TTH Positive	Seizure	AED 5 5	No improvement						
F 35					Memory deficit, seizure, headache	Steroids, IVIG, AED	3	2	Improvement
M 43 TTH					Memory deficit, seizure, depression	Steroids, AED	3	3	Improvement
M 32					Memory deficit, concentration problems, seizure, depression	Steroids, AED	3	2	Improvement
M 69 Positive					Memory deficit, disorientation, gait ataxia, resting	Steroids, plasmapheresis, rituximab	3	3	Improvement

					tremor, anxiety				
F 65 TTH					Memory deficit, seizure	Steroids, plasmapheresis, cyclophosphamide, AED	3	2	Improvement
F 75	Seizure AED 5 2	Improvement							
M 81					Memory deficit, seizure	Steroids, AED	5		Lost of follow-up
F 57	Seizure AED 1	Lost of follow-up							
F 67 MO	Seizure Steroids, AED 2 1	Improvement							
M 32	Positive Seizure					Steroids, plasmapheresis, rituximab, AED	1	1	Improvement
M 53 TTH					Memory deficit, seizure, ataxia	Steroids, azathioprin,	3	3	Improvement

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						mycophenolatmofetil			
M 46					Memory deficit, seizure	Steroids, AED	3	3	No improvement
M 40					Loss of consciousness, diplopia, sensorimotor tetraparesis	Steroids	5	3	Improvement
F 18 TTH					Memory deficit, seizure, aphasia	Steroids, plasmapheresis, rituximab, AED	5	3	Improvement
F 73 N/K					Memory deficit, seizure, headache, depression	Steroids, plasmapheresis, azathioprine, IVIG, AED	3	3	No improvement
M 52 TTH	Seizure	Steroids, rituximab, 1	1	Impro					vement

						AED			
F 39 TTH					Seizure, vertigo, aphasia, depression	Steroids, AED	2	1	Improvement
F 47 N/K					Aphasia, lack of energy, disorientation, visual deficits, gait ataxia, vertical palsy	Steroids, AED	4	4	No improvement
F 46 TTH Positive	Memory deficit					Steroids, plasmapheresis, rituximab, AED	3	2	Improvement

- TTH
- Tension-type headache
- MO
- Migraine without aura
- N/C
- Retrospectively not to classify

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N/K	-	Not known
AED	-	Antiepileptic drugs
IVIG	-	Intravenous immunoglobulins
mRS		Modified Rankin-scale score

Supplementary Table 2: Autoimmune encephalitis was diagnosed based on the presence of antibodies, typical MRI-findings, tumour occurrence, and evidence of autoimmune encephalitis in brain biopsy. The table further shows the earliest CSF findings of the study population.

Patient	Antibodies	Titer	MRI	Tumour within 5 years	Histology	CSF		
						Cell count (normal up to 5/ μ l)	Protein (mg/dl)	Glucose (mg/ml)
1	NMDA-R	N/A ¹	DWI superior frontal gyrus left	Tubal carcinoma		345	93	59
2	NMDA-R	N/A ¹	Generalized atrophy, microangiopathy	Tonsillar carcinoma		32	75	51
3	NMDA-R	1:3200	DWI frontal right and periventricular			2	50	54
4	NMDA-R and LGI1	N/A ¹ and 392pmol l ⁻¹	FLAIR hyperintensity bitemporal			N/A	N/A	N/A
5	CV2 and CASPR2	N/A ¹ and 321pmol l ⁻¹	FLAIR hyperintensity mesial temporal lobe, basal ganglia			1	30	60
6	CASPR2	6019pmol l ⁻¹	FLAIR hyperintensity mesial temporal lobe, hippocampal sclerosis left			2	23	60
7	Ma1	N/A ¹	FLAIR hyperintensity bilateral mesial temporal lobe			5	81	57
8			FLAIR hyperintensity and DWI bilateral hippocampus, white matter, periventricular, contrast enhancing			65	55	95
9	CASPR2	804pmol l ⁻¹	Empty sella			3	26	62

10			FLAIR hyperintensity mesial temporal lobe			13	90	81
11	NMDA-R	1:100	FLAIR hyperintensity temporal, parietal, occipital left, frontal right			1	53	64
12	NMDA-R	N/A ¹	Cortical atrophy, microangiopathy			1	33	57
13	NMDA-R	1:500	Normal			560	71	62
14	Ma1	N/A ¹	FLAIR hyperintensity periventricular (3rd ventricle), medial thalamus, superior and inferior colliculi	Colon carcinoma		0	74	59
15	Hu	N/A ¹	Microangiopathy	Small cell lung cancer		4	31	72
16	Hu	N/A ¹	FLAIR hyperintensity bilateral mesial temporal lobe	Small cell lung cancer		3	48	63
17	LGI1	1:100	FLAIR hyperintensity left mesial temporal lobe		AE	4	58	68
18			Hippocampal lesion right after biopsy		AE	15	706	N/A
19	NMDA-R	N/A ¹	FLAIR hyperintensity and atrophy bilateral hippocampus	Acute myeloic leukemia		11	377	N/A
20	NMDA-R	1:320	FLAIR hyperintensity left parahippocampal gyrus and fornix, right temporal lobe, left medial frontal gyrus			9	46	60
21	NMDA-R	1:32	FLAIR hyperintensity and sclerosis left hippocampus			1	48	70
22			DWI left parahippocampal gyrus, entorhinal gyrus, lateral			4	31	55

			and posterior temporal lobe					
23	LGI1	1:100	FLAIR hyperintensity bilateral hippocampus			1	48	56
24			Hippocampal sclerosis left	Hodgkin lymphoma, malignant melanoma		82	59	N/A
25	NMDA-R	1:1000	FLAIR hyperintensity bilateral hippocampus, bilateral cerebellum	Prostatic cancer		32	601	48
26	LGI1	1:100	FLAIR hyperintensity bilateral hippocampus, periventricular			2	35	83
27	LGI1	1:100	Microangiopathy			0	42	73
28	NMDA-R	1:1000	N/A			5	124	74
29	Hu	1:1000	FLAIR hyperintensity bilateral hippocampus, right amygdala			14	758	N/A
30	NMDA-R	1:32	Cortical DWI right temporal, parietal, occipital, microangiopathy, old MCA stroke left			1	117	57
31	Ma 2	1:10000	FLAIR hyperintensity left hippocampus, amygdala, posterior insula, anterior temporal lobe	Testicular cancer		0	34	65
32	GAD	N/A ¹	Normal			2	147	58
33	Ma2	N/A ¹	FLAIR hyperintensity mesial temporal lobe		AE	9	35	N/A

34	NMDA-R	N/A ¹	FLAIR hyperintensity raphe nuclei, pons, anterior medulla, cervicothoracic myelom			83	31	66
35	NMDA-R	1:100	FLAIR hyperintensity and DWI frontal right, left cerebellar			5	39	47
36	LGI1	1:320	Parietal atrophy, migroangiopathy			4	34	72
37	LGI1	1:10	Normal			2	39	61
38	CASPR2	205pmol l ⁻¹	FLAIR hyperintensity left mesial temporal lobe			N/A ²	N/A ²	N/A ²
39	NMDA-R	1:10	FLAIR hyperintensity bilateral thalamus			N/A ²	N/A ²	N/A ²
40	GAD	>300U/ml	FLAIR hyperintensity right hippocampus, parahippocampal gyrus, insula, amygdala			4	53	58

- DWI

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Alteration in diffusion weighted imaging sequence
- FLAIR

-

Fluid attenuated inversion recovery
- AE

-

Autoimmune encephalitis in brain biopsy
- N/A

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No information available

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- N/A¹ - Titer not available, positive according to documentation
- N/A² - Values not available, unremarkable according to documentation