

Supplementary Table 1 Reported cases of ovarian teratoma related anti-NMDAR encephalitis

N°	Authors	year of pub	Journal	Country	No. of cases with OT	Age/(date onset)	Clinical presentation										Abnormal EEG	
							Prodrome	Prodrome time to psychosis,day	PB	Speech	Seizures	Movement disorder	Decreased level of consciousness	Autonomic dysfunction	central hypoventilation	normal/abnormal	focal or diffuse or disorganized activity	
1	Giné Servén, E.	2019	Clinical Case Reports	Spain	3	17	headaches	within 1d	Yes	Yes		Yes		Yes			Yes	
2						23	No		Yes									
3						35	No		Yes	Yes		Yes	Yes	Yes	Yes			
4	Li, W.	2019	Medicine (United States)	China	1	23				Yes	Yes					abnormal	Yes	
5	Sancho-Saúco, J.	2019	Journal of Obstetrics and Gynaecology	Spain	2	27					Yes		Yes	Yes		normal		
6						33	fever, headache	3d			Yes		Yes					
7	Curnow, S.R.	2019	Pediatric Neurology	Australia	1	14	No		Yes							abnormal		
8	Chung, S.-H.	2019	Journal of Obstetrics and Gynaecology	Korea	2	21	headache				Yes	Yes				abnormal		
9						36	headache	1d	Yes									
10	Poorthuis, M.	2019	Neurology: Neuroimmunology and NeuroInflammation	Netherlands	1	32	vertigo, nausea, vomiting	4d	Yes	Yes		Yes						
11	Treidl, L.	2019	Neuropsychiatrie	Österreich	1	18			Yes		Yes	Yes	Yes	Yes	Yes	abnormal		
12	Kaminski, J.A.	2019	European Journal of Neurology	Germany	1	18			Yes									
13	Chiu, H.-C.	2019	Taiwanese Journal of Obstetrics and Gynecology	Taiwan	2	27	vomiting, headache, fever	14d	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
14						28	fever	7d	Yes		Yes		Yes	Yes	Yes	abnormal	Yes	
15	Kalam, S.	2019	Practical Neurology	UK	1	34					Yes	Yes		Yes	Yes	abnormal	Yes	
16	Seward, S.	2019	Journal of American College Health	USA	2	18	headache	7d			Yes	Yes	Yes					
17						34	fainting	7d	Yes				Yes					
18	Barth, A.	2019	Neuropediatrics	USA	1	17			Yes								No	
19	Matsuoka, S.	2019	Clinical and Experimental Obstetrics and Gynecology	Japan	2	31	fever, headache	11d	Yes	Yes					Yes			
20						18	headache	14d	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
21	Guanyabens-Buscà, N.	2019	Revista de Neurologia	Spain	3	17	headaches, general discomfort		Yes	Yes		Yes				abnormal	Yes	
22						23	No		Yes	Yes						abnormal		
23						35	No		Yes	Yes	Yes	Yes	Yes	Yes		abnormal		
24	Hashimoto, R.	2019	Case Rep Neurol Med	Japan	1	19	headache, fever	3d	Yes		Yes	Yes	Yes		Yes			
25	Inayat, F.	2019	Cureus	USA	1	34	No		Yes		Yes	Yes	Yes	Yes	Yes	abnormal	Yes	
26	Li, W.	2019	Medicine (Baltimore)	China	1	23					Yes		Yes					
27	Wada, N.	2018	Medicine (United States)	Japan	1	31			Yes	Yes	Yes							
28	Urriola, N.X.	2018	Journal of Clinical Neuroscience	Australia	1	26	imbalance, nausea, vomiting	1d										
29	Salehi, N.	2018	The American journal of case reports	USA	1	21	headach	2d	Yes	Yes	Yes	Yes		Yes	Yes	abnormal	Yes	
30	Schutt-Ainé, K.	2018	Neurodiagnostic Journal	Canada	1	20			Yes			Yes				abnormal	Yes	
31	Lwanga, A.	2018	Neuroradiology Journal	USA	1	26					Yes	Yes		Yes	Yes	abnormal	Yes	
32	Ferreira, M.G.	2018	Medicine (United States)	Spain	1	31	headach, general malaise	3d	Yes	Yes	Yes	Yes	Yes	Yes	Yes	abnormal	Yes	
33	Martin, A.L.	2018	Journal of Pediatric and Adolescent Gynecology	USA	1	13	fever, headache, nausea, vomiting, phonophobia	4d	Yes	Yes	Yes	Yes	Yes			abnormal	Yes	
34	Beecher, G.	2018	Neurology	Canada	1	23			Yes							abnormal	Yes	
35	Lee, K.W.	2018	Medicine (United States)	Taiwan	1	28	abdominal pain, vomiting, diarrhea	2d	Yes	Yes	Yes	Yes	Yes	Yes	Yes	abnormal	Yes	

36	Hébert, J.	2018	Canadian Journal of Neurological Sciences	Canada	1	29	word- finding difficulties	6d	Yes	Yes	Yes	Yes			abnormal	Yes	
37	Chourasia, N.	2018	Pediatric Neurology	USA	1	32	headach				Yes						
38	Uchida, Y.	2018	Neuropsychiatric Disease and Treatment	Japan	1	20	fever, headache	7d	Yes		Yes		Yes		abnormal		
39	Leel, N.	2018	BMJ Case Reports	UK	1	7			Yes	Yes		Yes	Yes		Yes	abnormal	Yes
40	Abuzaid, M.	2018	Cureus	Saudi Arabia	1	21	headache, flu-like illness	2d	Yes	Yes		Yes			normal		
41	Bhat, P.	2018	J Community Hosp Intern Med Perspect	USA	1	26			Yes	Yes		Yes	Yes				
42	Mitra, A. D.	2018	Autops Case Rep	USA	1	22			Yes								
43	Sato, M.	2018	JA Clin Rep	Japan	2	17	headache, fever	5d	Yes	Yes	Yes	Yes		Yes	Yes		
44						28			Yes	Yes	Yes						
45	Vasenina, E.E.	2017	Zhurnal Nevrologii i Psihatrii imeni S.S. Korsakova	Russia	1	28	general exhaustion	10d	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
46	Reyna-Villasmil, E.	2017	Medicina Clinica	Ecuador	1	23	fever, headache		Yes	Yes	Yes				abnormal	Yes	
47	Uchida, Y.	2017	Journal of the Neurological Sciences	Japan	1	21			Yes				Yes		abnormal		
48	Liang, Z.	2017	Medicine (United States)	China	2	17	fever, dizziness	7d		Yes					normal		
49						16			Yes		Yes	Yes	Yes		abnormal	Yes	
50	Kumari, K.	2017	Türk Anesteziyoloji ve Reanimasyon Derneği Dergisi	India	2	26	headache, decreased sleep		Yes		Yes	Yes	Yes		Yes	abnormal	Yes
51						24	headach		Yes		Yes	Yes			abnormal		
52	Ueda, J.	2017	Epileptic Disorders	China	1	22	amnesia, headache		Yes		Yes	Yes	Yes	Yes	Yes	Yes	
53	Niu, C.	2017	Chinese Medical Journal	China	1	22	fever, headache	18d			Yes	Yes					
54	Aung, T.	2017	Pediatrics in Review	USA		16			Yes			Yes		Yes	normal		
55	van der Meulen, A.A.E.	2017	Clinical Neurophysiology	Netherlands	1	42	fever, headache, diarrhea, vomiting				Yes	Yes	Yes		Yes	abnormal	Yes
56	Mutti, C.	2017	Neurological Sciences	Italy	1	31			Yes	Yes	Yes			Yes	abnormal	Yes	
57	Maggio, M.C.	2017	Journal of Medical Case Reports	Italy	1	14			Yes	Yes	Yes	Yes					
58	Mariotto, S.	2017	Neurological Sciences	Italy	1	25	flu-like symptoms		Yes						abnormal	Yes	
59	Omata, T.	2017	Brain and Development	Japan	2	14			Yes			Yes		Yes			
60						11			Yes			Yes	Yes				
61	Demma, L., Norris, S., Dolak, J.	2017	International Journal of Obstetric Anesthesia	USA	1	28	fever	4d	Yes		Yes			Yes	Yes		
62	Kataoka, H.	2017	Medicine (United States)	Japan	1	29			Yes		Yes	Yes	Yes	Yes	Yes		
63	Zhang, X.	2017	Chinese Medical Sciences Journal	China	2	20	headach		Yes		Yes	Yes	Yes		abnormal	Yes	
64						22			Yes								
65	Uchida, Y.	2017	Journal of the Neurological Sciences	Japan	1	20	headach		Yes				Yes		abnormal		
66	Nakamoto, R.	2017	Clinical Nuclear Medicine	Japan	1	38			Yes								
67	Pattanayak, P.	2017	Clinical Nuclear Medicine	USA	1	33			Yes		Yes						
68	Wang, Y.-P.	2017	Journal of Shanghai Jiaotong University (Medical Science)	China	3	16			Yes		Yes	Yes	Yes				
69						17	fever, headache		Yes			Yes	Yes				
70						26	fever				Yes		Yes				
71	Terada, A.	2017	Gynecology and Minimally Invasive Therapy	Japan	2	40			Yes		Yes	Yes					
72	Gastañaga-Holguera, T.	2017	Revista Chilena de Obstetricia y Ginecologia	Spain	1	22			Yes								
73	Jasińska-Mikołajczyk, A.	2017	Postepy Psychiatrii i Neurologii	Poland	1	46			Yes	Yes	Yes			Yes	abnormal		
74	Doden, T.	2017	Internal Medicine	Japan	1	24			Yes		Yes	Yes	Yes	Yes	Yes	abnormal	
75	Wójtowicz, R.	2017	Aktualności Neurologiczne	Poland	1	23	fever, headache	2d	Yes		Yes	Yes	Yes	Yes	Yes	Yes	

76	Alexander, S.	2017	Asian Journal of Pharmaceutical and Clinical Research	India	1	17	headach, fever		Yes		Yes						
77	Vasena, E.E.	2017	Zhurnal Nevrologii i Psihiatrii imeni S.S. Korsakova	Russia(1)	1	28			Yes		Yes						
78	Fauzi, N.A.M.	2017	Proceedings of Singapore Healthcare	Malaysia	1	21	fever, headache	7d	Yes		Yes	Yes	Yes	Yes	Yes	abnormal	Yes
79	Jones, B.P.	2017	BJOG: An International Journal of Obstetrics and Gynaecology	UK	1	29			Yes		Yes		Yes	Yes		abnormal	
80	Ahmad, J.	2017	Cureus	USA	1	26			Yes		Yes	Yes		Yes		abnormal	
81	Hernaiz-Goni, P.	2017	Rev Neurol	Spain	1	27			Yes		Yes					abnormal	Yes
82	Voice, J.	2017	Arch Womens Ment Health	USA	1	17	fatigue	7d	Yes	Yes		Yes	Yes	Yes			
83	Mathai, S.K.	2016	New England Journal of Medicine	USA	1	27	nausea, palpitations	7d	Yes	Yes	Yes	Yes		Yes	Yes	abnormal	
84	Vanya, M.	2016	Idegygyaszati Szemle	Hungary	1	25			Yes		Yes	Yes	Yes	Yes		normal	
85	Jandu, A.S.	2016	Journal of the Intensive Care Society	UK	1	35					Yes				Yes	abnormal	
86	Abdul-Rahman, Z.M.	2016	Journal of Medical Case Reports	Australia	1	25	flu-like symptoms, headache	14d	Yes		Yes	Yes	Yes	Yes	Yes	abnormal	Yes
87	Rozier, M.	2016	Pediatric Neurology	USA	1	14			Yes		Yes	Yes		Yes			
88	Solis, N.	2016	Journal of Clinical Virology	USA	1	29	fever, headache	5d	Yes		Yes	Yes		Yes	Yes		
89	Clara, J.A.	2016	American Journal of Medicine	USA	1	31			Yes	Yes	Yes	Yes				abnormal	Yes
90	Kaneko, C.	2016	Brain and Nerve	Japan	2	14			Yes	Yes		Yes					
91						34			Yes		Yes		Yes				
92	Hong, K.	2016	Chinese Journal of Contemporary Neurology and Neurosurgery	China	2	28	fever, headache, 恶心, 呕吐	7d	Yes	Yes	Yes	Yes	Yes	Yes	Yes	abnormal	
93						31	fever	10d	Yes		Yes	Yes	Yes	Yes	Yes	abnormal	Yes
94	Xu, T.-D.	2016	Chinese Medical Sciences Journal	China	1	21			Yes			Yes	Yes	Yes	Yes	abnormal	Yes
95	Shen, Y.	2016	Chinese Journal of Contemporary Neurology and Neurosurgery	China	1	17	fever	2d		Yes	Yes	Yes	Yes	Yes	Yes	abnormal	
96	Gao, X.	2016	International Journal of Clinical and Experimental Medicine	China	1	17			Yes		Yes		Yes		Yes		
97	Sunwoo, J.-S.	2016	Journal of ECT	Korea	1	27	headach	10d	Yes	Yes	Yes	Yes	Yes			abnormal	Yes
98	Hegen, H.	2016	BMC Neurology	Austria	1	31	general discomfort	14d	Yes		Yes						
99	Herlopian, A.	2016	Epilepsy and Behavior Case Reports	USA	1	25	headach	7d	Yes		Yes	Yes		Yes	Yes	abnormal	
100	Raynor, G.	2016	Harvard Review of Psychiatry	USA	1	24			Yes			Yes	Yes	Yes	Yes	abnormal	Yes
101	Vargas, R.J.	2016	Journal of Ultrasound in Medicine	USA	1	25			Yes					Yes			
102	Mizutamari, E.	2016	Clinical Case Reports	Japan	1	30	fever, headache						Yes		Yes		
103	Rutledge, S.	2016	QJM	Ireland	1	73					Yes					abnormal	
104	Tantipalakorn, C.	2016	BMJ Case Reports	Thailand	1	23	headach	14d	Yes		Yes				Yes	abnormal	
105	Abe, K.K.	2016	Pediatric Emergency Care	USA	1	15	headach, nausea, vomiting	12d								normal	
106	Li, L.	2016	Academic Journal of Second Military Medical University	China	2	28	nausea, vomiting		Yes	Yes	Yes	Yes	Yes	Yes			
107						25			Yes			Yes					
108	Milovac, Z.	2016	Psychiatria Danubina	Croatia	1	34	fever, headache	14d	Yes	Yes	Yes		Yes	Yes	Yes	normal	
109	Kremm, L. A.	2016	Pm r (海报)	USA	1	26			Yes								
110	Lee, L. H.	2016	Acta Neurol Taiwan		1	17	intermittent dizziness, fever	10d, 3d			Yes	Yes	Yes	Yes	Yes	abnormal	
111	Medepalli, K.	2016	SAGE Open Med Case Rep	USA	1	23			Yes	Yes	Yes	Yes	Yes	Yes	Yes	abnormal	Yes
112	Shimoyama, Y.	2016	JA Clin Rep	Japan	1	19			Yes		Yes				Yes	normal	
113	Yamanaka, D.	2016	Springerplus	Japan	1	27	fever, headach		Yes	Yes		Yes		Yes	Yes	abnormal	Yes
114	Braverman, J.A.	2015	Gynecologic Oncology Reports	USA	1	12	headach	7d	Yes	Yes				Yes	Yes		

115	Shah, A.	2015	European Journal of Obstetrics and Gynecology and Reproductive Biology	India	1	32	headach			Yes	Yes			Yes				
116	Liu, H.	2015	BMC Anesthesiology	China	2	31				Yes	Yes	Yes			abnormal	Yes		
117						22	fever, headache		Yes		Yes	Yes		Yes	Yes	abnormal	Yes	
118	Malayev, Y.	2015	Journal of the American Osteopathic Association	USA	1	33	generalized malaise	1d	Yes		Yes							
119	Spiegel, D.R.	2015	Clinical Schizophrenia and Related Psychoses	USA	1	18			Yes		Yes		Yes		abnormal	Yes		
120	Kurita, D.	2015	Psychiatry and Clinical Neurosciences	Japan	1	23			Yes						abnormal	Yes		
121	Koksal, A.	2015	Neurological Sciences	Turkey	1	25			Yes		Yes				normal			
122	Chan, L.W.	2015	New Zealand Medical Journal	Australia	1	23			Yes			Yes	Yes	Yes	Yes	Yes	abnormal	
123	Yanai, S.	2015	Clinical and Experimental Obstetrics and Gynecology	Japan	1	21			Yes		Yes	Yes	Yes		normal			
124	Imai, K.	2015	Experimental and Therapeutic Medicine	Japan	1	39	fever, stomach ache		Yes			Yes		Yes	Yes			
125	Arteche Andrés, M.A.	2015	Revista Espanola de Anestesiologia y Reanimacion	España	1	27	headach, fever		Yes	Yes	Yes	Yes	Yes					
126	Neiman, E.S.	2015	Neurodiagnostic Journal	USA	1	25	headache, nausea, fever	7d	Yes		Yes	Yes	Yes	Yes	Yes	Yes	abnormal	Yes
127	Zhou, S.-X.	2015	International Journal of Clinical and Experimental Pathology	China	1	31	headake		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	abnormal	Yes
128	Hur, J.	2015	Infection and Chemotherapy	Korea	1	36	headake	5d	Yes	Yes							abnormal	Yes
129	Ación, P.	2015	Journal of Obstetrics and Gynaecology	Spain	1	24			Yes			Yes		Yes		abnormal	Yes	
130	Lau, R.R.	2015	Neurodiagnostic Journal	USA	1	18			Yes		Yes		Yes		Yes		abnormal	
131	Kim, J.	2015	J Epilepsy Res	Korean	1	28	fever, headach, sleep disturbance	14d	Yes		Yes	Yes	Yes	Yes	Yes	Yes	abnormal	
132	Omura, T.	2015	Acute Med Surg	Japan	1	20	fever, headach, sleep disturbance	7d	Yes			Yes	Yes		Yes		abnormal	Yes
133	Ziaeian, B.	2015	Tex Heart Inst J	USA	1	19	headache	14d	Yes		Yes			Yes		abnormal		
134	Kattepur, A.K.	2014	World Journal of Surgical Oncology	India	1	36			Yes	Yes						normal		
135	Zhou, X.	2014	Zhonghua fu chan ke za zhi	China	5	22			Yes		Yes	Yes	Yes		Yes			
136						26			Yes	Yes	Yes	Yes						
137						28	flu-like illness		Yes	Yes	Yes	Yes						
138						32	fever	6d	Yes	Yes	Yes	Yes						
139						31			Yes	Yes	Yes	Yes			Yes			
140						19			Yes	Yes		Yes	Yes	Yes	Yes	Yes	abnormal	Yes
141	Appu, M.	2014	Pediatric Neurology	USA	1	16	fever, headache		Yes			Yes	Yes	Yes		abnormal	Yes	
142	Nijmeijer, S.	2014	European Journal of Pediatrics	The Netherlands	1	9	headach, vomiting		Yes	Yes		Yes	Yes	Yes	Yes	Yes	abnormal	Yes
143	Cleverly, K.	2014	Acta Obstetricia et Gynecologica Scandinavica	UK	2	25			Yes		Yes	Yes		Yes				
144						22			Yes		Yes	Yes			Yes			
145	Sawamura, H.	2014	Journal of Neuro-Ophthalmology	Japan	1	20	fever, headache		Yes		Yes				Yes			
146	VanHaerents, S.	2014	Epilepsy and Behavior Case Reports	USA	1	27			Yes	Yes	Yes	Yes		Yes		abnormal		
147	Serban-Pereteanu, A.S.	2014	Romanian Journal of Neurology/ Revista Romana de Neurologie	România	1	42			Yes	Yes		Yes	Yes	Yes	Yes	Yes	abnormal	Yes
148	Asai, C.	2014	Brain and Nerve	Japan	1	29	headach, fever, vomiting	7d	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
149	Kittichanteera, S.	2014	Neurology Asia	Thailand	1	16	headach, fever, nausea, vomiting	7d	Yes		Yes	Yes	Yes	Yes	Yes	Yes	abnormal	Yes
150	Parada Garza, J.D.	2014	Revista Mexicana de Neurociencia	México	1	33			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	abnormal	Yes
151	Wong, D.	2014	IDCases	USA	1	21	headach	14d	Yes	Yes		Yes		Yes	Yes	Yes	abnormal	Yes
152	Tsuyusaki, Y.	2014	Neurological Sciences	Japan	1	21	dizziness	5d	Yes	Yes	Yes	Yes			Yes	Yes	normal	

153	Hayashi, M.	2014	Case Rep Obstet Gynecol	Japan	1	18	headache, fever	a few days	Yes	Yes		Yes	Yes		Yes		
154	Keller, S.	2014	Case Rep Psychiatry	Israel	1	32	sleeplessness	5d	Yes	Yes	Yes						
155	Lapebie, F. X.	2014	BMC Anesthesiol	France	1	24			Yes	Yes	Yes	Yes	Yes		Yes	abnormal	Yes

**Supplementary Table 2 Clinical features and laboratory results of six patients**

NO.	Date onset	Age	Prodrome	Time to psychiatric stage	Psychiatric behavioral	Memory loss	Seizures	Abnormal movement	Autonomic dysfunction	EEG	CSF		NMDAR Ab	
											WBC count (*10 <sup>6</sup> /L)	Serum	CSF	
1	July 2012	21	Fever Headache	8 days	Delirium, agitation, aggressive behavior, irritability, cognitive decline	Yes	Yes	Yes	Yes (urinary incontinence)	δ and θ waves	3	+	+	
2	November 2013	27	None	/	Apathy, mutism, stupor, cognitive decline	Yes	Yes	Yes	Yes (digestive system)	Diffused slow waves	1	+	+	
3	May 2018	27	Fever	4 days	Hallucination, aggressive behavior, cognitive decline	Yes	Yes	Yes	Yes (respiratory system)	Unable to judge	12	+	+	
4	April 2018	25	Fever Headache	9 days	Panic disorder, hallucination, cognitive decline	Yes	Yes	Yes	Yes (uroschesis, respiratory system)	Unknown	28	+	+	
5	June 2019	24	None	/	Mania, apathy, cognitive decline	Yes	Yes	Yes	None	Slow waves	0	+	+	
6	October 2019	26	None	/	Delirium, mania, irritability, cognitive decline	Yes	Yes	Yes	None	Slow waves	2	+	+	

## Supplementary Table 3 Diagnostic criteria for anti-NMDAR encephalitis

Diagnostic criteria for anti-NMDAR encephalitis	
Probable anti-NMDAR encephalitis (All three of the following)	<p>1. Rapid onset (less 3 months) of at least four of six following major groups of symptoms</p> <ul style="list-style-type: none"> <li>(1). Abnormal (psychiatric) behavior or cognitive dysfunction</li> <li>(2). Speech dysfunction (pressured speech, verbal reduction, mutism)</li> <li>(3). Movement disorder, dyskinesias, or rigidity/abnormal postures</li> <li>(4). Decreased level of consciousness</li> <li>(5). Autonomic dysfunction or central hypoventilation</li> <li>(6). Seizure</li> </ul> <p>2. At least one of the following lab study results</p> <ul style="list-style-type: none"> <li>(1). Abnormal EEG (focal or diffuse slow, epileptic activity or extreme <math>\delta</math> brush pattern)</li> <li>(2). CSF with pleocytosis or oligoclonal bands</li> </ul> <p>3. Reasonable exclusion of other disorders</p>
Definit anti-NMDAR encephalitis	<p>Diagnosis can be made in the presence of one or more of the six major groups of symptoms and IgG anti-GluN1 antibodies after reasonable exclusion of other disorders. Antibody testing should include CSF. If only serum is available, confirmatory test should be included (live neurons or tissue immunohistochemistry in addition to cell-based assay).</p>

## Supplementary Table 4 Five stages of clinical manifestations in anti-NMDAR encephalitis

---

Five stages of clinical manifestations in anti-NMDAR encephalitis	
Prodromal stage (approximately 2 weeks)	Fever Headache Nausea Vomiting Diarrhea
Psychotic stage	Psychotic symptoms Memory loss
Unresponsive stage	Dissociated performances Unresponsive performances
Hyperkinetic stage	Abnormal movements Autonomic dysfunctions
Gradual recovery stage (approximately 3 to 4 months)	Opposite sequence of symptoms

---