

## Supplementary Online Content

Ariño H, Höftberger R, Gresa-Arribas N, et al. Paraneoplastic neurological syndromes and glutamic acid decarboxylase antibodies. *JAMA Neurol*. Published online June 22, 2015. doi:10.1001/jamaneurol.2015.0749.

**eFigure.** Flowchart of Patients

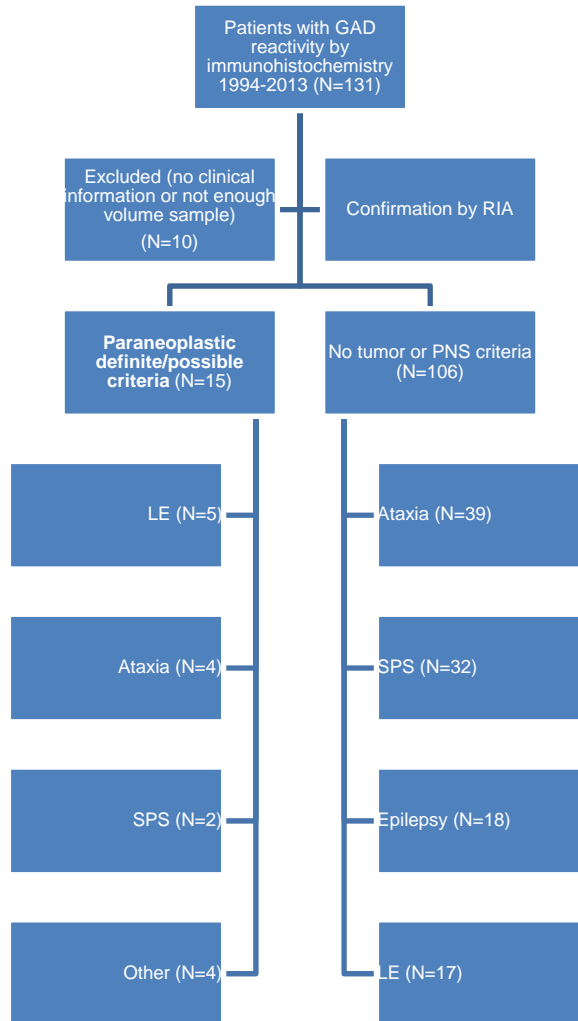
**eTable 1.** Patients of Our Series With Paraneoplastic Neurological Syndromes and GAD Antibodies

**eTable 2.** Literature Survey of Patients With Paraneoplastic Neurological Syndromes and GAD Antibodies

**eReferences**

This supplementary material has been provided by the authors to give readers additional information about their work.

**eFigure. Flowchart of Patients**



RIA: radioimmunoassay; PNS: paraneoplastic syndrome; LE: limbic encephalitis; SPS: stiff-person syndrome.

**eTable 1.** Patients of Our Series With Paraneoplastic Neurological Syndromes and GAD Antibodies

Patient	Age/Sex	Syndrome	PNS level	First diagnosis (delay in months)	Tumor	Treatment	Outcome (follow-up in months)	Comments
1	80/M	LE	Definite	PNS (3)	SCLC (relapse)	Steroids, chemotherapy	Worse (6)	Thyroiditis
2	79/M	CA	Possible	PNS (2)	NSCLC	IVIg, steroids	Worse (7)	
3	54/M	CA	Possible	PNS (6)	Thymic neuroendocrine carcinoma <sup>a</sup>	Surgery, chemotherapy, RT, IVIg, steroids, rituximab	Improved (91)	Hypothyroidism and diabetes years later
4	57/F	PCD	Definite	PNS (1)	Thymic neuroendocrine carcinoma	Steroids, IFN alpha-2b	Improved (4)	Hypothyroidism
5	67/M	PEM	Definite	PNS (3)	Pancreatic neuroendocrine carcinoma <sup>a</sup>	Surgery, IVIg, diazepam, baclofen, gabapentine	Death (12)	
6	61/F	CA	Possible	Tumor (15)	Breast	Surgery, chemotherapy, RT, IVIg, PLEX, cyclophosphamide	Stable (91), relapse 3 years later, response to immunotherapy	Myasthenia
7	73/F	LE	Definite	PNS (2)	NHL (Burkitt)	Steroids, IVIg	Death (3)	Dysautonomia
8	70/M	LE	Definite	PNS (1)	SCLC	Steroids, IVIg,	Death (2)	
9	78/F	Brainstem <sup>b</sup>	Possible	PNS (5)	Pancreatic neuroendocrine carcinoma <sup>a</sup>	Surgery, chemotherapy, IVIg	Stable (27)	
10	66/M	LE	Definite	PNS (1)	SCLC	Steroids, IVIg	Death (13)	
11	37/M	LE	Definite	PNS (3)	Thymoma	Surgery, steroids	Improved (4)	Later developed

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								SPS
12	72/M	OMS	Definite	Tumor (1)	NSCLC	Surgery, chemotherapy, IVIg, steroids	Death (1)	
13	47/M	SPS	Possible	Tumor (27) <sup>c</sup>	SCLC	Chemotherapy, steroids	Stable (9)	Diabetes
14	40/F	SPS	Possible	PNS (24)	Breast	Surgery, chemotherapy, IVIg, steroids, diazepam	Worse (84)	Thyroiditis, CA 5 years later
15	29/F	Encephalitis <sup>d</sup>	Possible	Tumor (19)	Thymoma	Surgery, steroids, PLEX	Improved (2)	Myasthenia

PNS: paraneoplastic neurological syndrome; LE: limbic encephalitis; PCD: paraneoplastic cerebellar degeneration; PEM: paraneoplastic encephalomyelitis; SCLC: small-cell lung cancer; NSCLC: non-small cell lung cancer; HNL: non-Hodgkin lymphoma; SPS: stiff-person syndrome; RT: radiotherapy; PLEX: plasma exchange; IVIg: intravenous immunoglobulins; OMS: opsoclonus-myoclonus syndrome

<sup>a</sup> Tumor cells expressed GAD65; <sup>b</sup> Vertigo, ataxia, axial rigidity, and dysautonomia; <sup>c</sup> Tumor active at the time of PNS diagnosis; <sup>d</sup> Sleepiness, aphasia, left faciobrachial paresis and dystonic movements in both legs with a MRI showing multifocal cortico-subcortical hyperintensities in FLAIR sequences that improved in a second MRI.

**eTable 2.** Literature Survey of Patients With Paraneoplastic Neurological Syndromes and GAD Antibodies<sup>1-19</sup>

Author (year)	Age/sex	Syndrome	PNS level	First diagnosis (delay in months)	Tumor	Treatment	Outcome (follow-up in months)	Comments
Ferrari (1990)	31/M	SPS	Possible <sup>a</sup>	PNS (1)	Hodgkin (relapse)	Chemotherapy, diazepam, baclofen	Improved (12)	
Silverman (1999)	68/F	SPS (SLS)	Possible	PNS (1)	Breast	Steroids, clonazepam	Death (18)	Grave's disease. Autopsy: no inflammation
Hagiwara (2001)	40/F	SPS	Possible	PNS (1)	Thymoma	Surgery, RT steroids, immunoadsorption	Improved (?)	
Sinnreich (2001)	85/F	SPS	Possible	PNS (6)	Breast	Surgery, PLEX, IVIg, steroids	Improved (7)	Hashimoto; uveitis
Schiff (2003)	47/F	SPS (SLS)	Possible	Tumor relapse (9)	Multiple myeloma	Diazepam	Improved (24)	Hypothyroidism, epilepsy
Thomas (2005)	45/M	SPS	Possible <sup>a</sup>	PNS (11)	Thymoma	Surgery, baclofen, IVIg, clonazepam	Improved (18)	
Tanaka H (2005)	57/F	SPS	Possible <sup>a</sup>	PNS (4)	Thymoma	Diazepam, surgery baclofen	Improved (24)	SPS relapse, responded to IVIg
Iwata T (2006)	79/F	SPS (SLS)	Possible <sup>a</sup>	PNS (3)	Thymoma	Surgery, IVIg	Improved (12)	A relapse treated with PE
McHugh (2007)	53/M	SPS (SLS)	Possible	PNS (11)	Kindy	IVIg, baclofen, diazepam	Improved (48)	Hypothyroidism and diabetes
Agarwal (2010)	55/F	SPS (SLS)	Possible <sup>a</sup>	PNS (2)	Breast	Chemotherapy, steroids, baclofen,	Improved (12)	

						diazepam		
Rakocevic (2012)	44/F	SPS	Possible <sup>c</sup>	Tumor (48) <sup>b</sup>	Cutaneous T cell lymphoma	Baclofen, IVIg, diazepam, steroids, cyclophosphamide, tacrolimus,	Improved (156)	rituximab and alemtuzumab for relapses
Aghajanzadeh (2013)	32/M	SPS	Definite <sup>a</sup>	PNS (5)	Thymic carcinoma	Surgery	Improved (11)	Baclofen and diazepam not effective
Koca (2014)	58/F	SPS	Possible <sup>a</sup>	Tumor (?) <sup>d</sup>	Mesothelioma	Diazepam, baclofen, steroids	Death (3)	SPS did not improve
Kobayashi (2014)	68/M	SPS	Possible <sup>a</sup>	PNS (1)	Thymoma	Surgery, steroids	Improved (156)	Relapse 13 years later at the time of tumor recurrence
Spitz (2004)	73/M	PERM	Possible <sup>a</sup>	PNS (0.5)	SCLC	Chemotherapy, IVIg, diazepam	Death (1)	
Venker (2011)	52/M	CA and dystonia	Possible <sup>a</sup>	PNS (11)	Breast (relapse)	Chemotherapy, immunosorption	Improved (13)	
Carra-Dalliere (2012)	59/M	PEM	Definite	PNS (1)	SCLC	Chemotherapy, RT, IVIg	Improved (12)	
Laroumagne (2014)	65/M	OMS	Definite	PNS (0.5)	SCLC	Chemotherapy, steroids	Death (1)	
Lamotte (2014)	61/M	OMS	Definite	PNS (0.5)	Pyiform sinus	Chemotherapy, RT, IVIg	Improved (6)	

PNS: paraneoplastic neurological syndrome; SLS, stiff-limb syndrome; SPS: Stiff-person syndrome; RT: radiotherapy; PLEX: plasma exchange; IVIg: intravenous immunoglobulins; PERM: progressive encephalomyelitis with rigidity and myoclonus; PEM: paraneoplastic encephalomyelitis; SCLC: small-cell lung cancer; OMS: opsoclonus-myoclonus syndrome

<sup>a</sup> Amphiphysin antibodies not tested; <sup>b</sup> tumor active at the onset of the PNS; <sup>c</sup> PNS improved each time tumor was put into remission; <sup>d</sup> tumor active at the time of SPS diagnosis.

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