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**Article:**

Alam, T., Alix, J.J. [orcid.org/0000-0001-8391-9749](https://orcid.org/0000-0001-8391-9749), Rao, D.G. et al. (1 more author) (2016) Anti-MAG negative distal acquired demyelinating symmetric neuropathy in association with a neuroendocrine tumor. *Muscle Nerve*. ISSN 0148-639X

<https://doi.org/10.1002/mus.25269>

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This is the peer reviewed version of the following article: Alam, T., Alix, J. J.P., Ganesh Rao, D. and Hadjivassiliou, M. (2016), Anti-myelin-associated glycoprotein–negative distal acquired demyelinating symmetric neuropathy in association with a neuroendocrine tumor. *Muscle Nerve.*, which has been published in final form at <http://onlinelibrary.wiley.com/doi/10.1002/mus.25269>. This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Self-Archiving.

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**Anti-MAG negative distal acquired demyelinating symmetric neuropathy in association with a neuroendocrine tumour**

Journal:	<i>Muscle and Nerve</i>
Manuscript ID	MUS-16-0004.R2
Wiley - Manuscript type:	Noteworthy Cases
Date Submitted by the Author:	18-Jul-2016
Complete List of Authors:	Alam, Taimour; Leeds Teaching Hospitals NHS Trust, Clinical Neurophysiology Alix, James; Royal Hallamshire Hospital, Clinical Neurophysiology Rao, D; The Royal Hallamshire Hospital, Neurophysiology Hadjivassiliou, Marios; Royal Hallamshire Hospital, Neurology
Keywords:	Paraneoplastic neurological syndrome, Distal acquired demyelinating symmetric neuropathy, Anti-MAG, Paraneoplastic antibodies, DADS, IgM

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Manuscripts

1 Anti-MAG negative DADS

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3 **Anti-MAG negative distal acquired demyelinating symmetric neuropathy in association with a**  
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5 **neuroendocrine tumor**

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3 We followed with interest the fascinating cases of anti-MAG positive Distal Acquired Demyelinating  
4  
5 Symmetric (DADS) neuropathy by Ayyappan et al.,<sup>1</sup> and Galassi and Luppi<sup>2</sup>. We would like to take  
6  
7 this opportunity to add to this stimulating debate on the relationship between neoplasia and DADS  
8  
9 neuropathy.  
10

11  
12 A 75 year old woman was referred to our Neurology service with a 4 month history of paresthesia  
13  
14 affecting the hands and feet. She had a 2 year history of metastatic neuroendocrine tumor following  
15  
16 an abdominal lymph node biopsy strongly positive for CD56 and chromogranin. Cauda equina  
17  
18 syndrome occurred shortly after diagnosis due to a metastatic deposit at S2. Neurological  
19  
20 examination at this time revealed saddle anesthesia, lower limb weakness, and absent lower limb  
21  
22 reflexes. A course of radiotherapy, steroids, and somatostatin analog treatment improved leg  
23  
24 strength sufficiently for mobilization with a walking stick.  
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27  
28 Examination revealed no upper limb ataxia but mild lower limb heel-shin ataxia. Tandem walking  
29  
30 was difficult. Speech was normal. There was a loss of vibration sensation up to the knees bilaterally,  
31  
32 but joint position sense was preserved. Tendon stretch reflexes were absent throughout; power was  
33  
34 normal in the arms and reduced proximally in the legs. Nerve conduction studies demonstrated  
35  
36 unrecordable sensory nerve action potentials in upper and lower limbs with markedly prolonged  
37  
38 distal motor latencies with reduced terminal latency indices, particularly in the upper limbs (table 1).  
39  
40 Blood tests, including anti-MAG/IgM, anti-glutamic acid decarboxylase, anti-neuronal nuclei, anti-Hu,  
41  
42 anti-Yo, anti-Purkinje cell, anti-CV2/CRMP-5, anti-PNMA2(Ma/Ta), anti-Tr, voltage gated Ca channel,  
43  
44 and anti-ganglioside antibodies were all negative. Celiac serology was also negative. MR  
45  
46 spectroscopy showed significant reduction of the NAA/Cr ratio from the vermis and right  
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48 hemisphere but without cerebellar atrophy.  
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51  
52 Treatment with intravenous immunoglobulin produced no improvement, and her symptoms  
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54 progressed. Treatment with 10mg of prednisolone led to symptomatic stabilization. Unfortunately  
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3 she died approximately 2 years after her neuropathy diagnosis due to metastatic disease, with no  
4  
5 significant change in her neurological condition.  
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8 Our conclusion at the time of diagnosis was that the anti-MAG negative DADS neuropathy was  
9  
10 paraneoplastic in nature. A third of DADS cases may be negative for anti-MAG antibodies<sup>3</sup>,  
11  
12 suggesting the antibody is a marker for disease, rather than being pathognomonic. Larue et al.,  
13  
14 reported 10 cases of anti-MAG negative DADS neuropathy, 9 of whom had an associated  
15  
16 hematological condition<sup>4</sup>.  
17  
18

19 While the lack of paraneoplastic antibodies makes our association less firm, this may help explain  
20  
21 the plateau in symptoms<sup>5</sup>. It is also worth noting that antibodies are only present in around 50% of  
22  
23 patients with paraneoplastic syndromes<sup>6</sup>. Unfortunately, the palliative nature of our case also  
24  
25 precludes association by improvement after cancer treatment; by the criteria of Graus et al., our  
26  
27 case would be considered "possible paraneoplastic"<sup>6</sup>.  
28  
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30  
31 Stabilization of the patient's condition despite continuing malignant disease, raises the possibility of  
32  
33 the pathological process leading to the neuropathy being transient in nature. Overall, our experience  
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35 leads to us to agree with Ayyappan et al., in their conclusion of DADS associated with malignancy,  
36  
37 and also with Galassi and Luppi in their assertion that clinicians should maintain vigilance in  
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39 neuropathies with a possible paraneoplastic association, including the DADS variant.  
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**Abbreviations**

MAG: Myelin Associated Glycoprotein

DADS: Distal Acquired Demyelinating Symmetric

For Peer Review Only

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Table 1

Motor nerve conduction studies in the upper and lower limbs. Temperature was monitored and maintained at or above 34°C in the upper limbs and 32°C in the lower limbs

Nerve	Site	Amplitude (mV)	Distal motor latency (ms)	Conduction velocity (m/s)	F wave latency (ms)	Terminal latency index
R. Median	Wrist	6.1	14.4	-	48.2	0.10
	Elbow	5.5	-	42	-	-
L. Median	Wrist	5.9	12.9	-	40.9	0.10
	Elbow	4.9	-	48	-	-
R. Ulnar	Wrist	4.0	9.1	-	49.0	0.19
	B. Elbow	3.7	-	34	-	-
	A. Elbow	3.4	-	31	-	-
L. Ulnar	Wrist	3.8	6.1	-	40.9	0.25
	B. Elbow	3.5	-	40	-	-
	A. Elbow	3.4	-	43	-	-
R. Peroneal	Ankle	1.5	15.9	-	NR	0.14
	Fibula head	1.3	-	35	-	-
	Pop fossa	1.0	-	36	-	-
L. Peroneal	Ankle	0.9	14.9	-	-	0.22
	Fibula head	0.6	-	24	-	-
R. Tibial	M. Malleolus	NR	NR	-	-	-
L. Tibial	M. Malleolus	NR	NR	-	-	-

Normal values: Upper limb motor amplitudes >5mV, conduction velocity >48m/s, DML <4.5ms in median and <3.5ms in ulnar nerve, F wave latency <30ms (adjusted for height).