Unusual presentation of more common disease/injury

Two unusual variants of Guillain-Barre syndrome

Rajesh Verma, Tejendra S Chaudhari

Department of Neurology, Chhatrapati Shahuji Maharaj Medical University, Lucknow, Uttar Pradesh, India

Correspondence to Rajesh Verma, drajeshverma32@yahoo.com

Summary

Guillain-Barre syndrome (GBS) is a group of autoimmune diseases characterised by acute, acquired and immune-mediated polyneuroradiculopathy. A large number of clinical subtypes of GBS have been described over last 100 years since the first description of this syndrome. We report two such cases GBS variants—first, AMAN with brisk reflexes and second being acute motor axonal neuropathy with conduction block. Through this case report, we intend to make the treating physicians and neurologist aware of these rare variants so that such cases would be appropriately diagnosed and treated.

BACKGROUND

Guillain-Barre syndrome (GBS) is an acute, acquired, auto-immune polyradiculoneuropathy clinically characterised by acute, flaccid paralysis and areflexia.¹ Two features which are considered essential for its diagnosis include—progressive weakness of more than one limb and areflexia.¹ In this case report we highlight upon two uncommon variants of GBS. One patient had axonal form of GBS with brisk reflexes and the other patient had acute motor axonal neuropathy (AMAN) with conduction block. The pathophysiology related to these variants along with their clinical importance is discussed. The purpose of reporting these cases is to make the treating physician and neurologist aware of these clinical entities so that such patients are not deprived of treatment in the form of immunoglobulin or plasmapheresis which could be life saving.

CASE PRESENTATION**Case 1**

A 9-year-old girl presented with a history of progressive weakness in all four limbs for 13 days before admission. Patient was able to stand and walk with support. There was no sensory, bladder, bowel or any bulbar symptoms. She had an episode of sore throat around 6–7 days before she developed weakness of limbs. Examination revealed decreased power in muscles of all four limbs-Grade 3–4 (Medical Research Council (MRC)). Deep-tendon jerks were brisk and both plantars were downgoing. Cranial nerves, sensory and cerebellar systems examination was normal.

Case 2

A 20-year-old woman presented to us with a history of progressive weakness in all four limbs without any accompanying sensory complaint or any bowel, bladder complaint since 15 days. She required support to walk. There was history of loose motions 10 days prior to onset of weakness. Examination of the patient revealed decreased power in all four limbs, in both proximal and distal group of muscles (MRC grade 3–4). Cranial nerve, sensory and cerebellar examination was normal. Deep-tendon reflexes were preserved and plantars were downgoing.

INVESTIGATIONS**Case 1**

Her routine blood investigations were normal. Cerebrospinal fluid (CSF) examination revealed albuminocytological dissociation (proteins=98 mg/dl and cell count=5/mm³—all lymphocytes). Nerve conduction study (NCS) was performed (table 1; figure 1) which showed reduced compound muscle action potential (CMAP) amplitude with slightly reduced conduction velocity in both median, ulnar and posterior tibial nerves. CMAPs in both common peroneal nerves were not recordable. Sensory nerve action potentials (SNAPs) of both median, ulnar and sural nerves were normal. The distal latency of CMAPs and onset latency of all SNAPs in the above-mentioned nerves were normal. Thus, nerve conduction study revealed axonal motor polyneuropathy. MRI of spine was performed which was normal (table 1).

Case 2

Her routine investigations (CBC, electrolyte) were normal. CSF examination showed <5 cells/mm³. Protein-125 mg/dl, sugar was normal. Serum anti-GM1 IgG antibody was positive. Nerve conduction study revealed normal distal latencies with amplitude of CMAPs (median and common peroneal) on distal stimulation but the amplitude was greatly reduced on proximal stimulation with normal conduction velocity suggestive of motor conduction block (decrease of greater than 50% in CMAP amplitude from distal to proximal stimulation without temporal dispersion). The amplitude of CMAPs was less than normal even on distal stimulation of ulnar and posterior tibial nerves. Sensory nerve action potentials in both median, ulnar and sural nerve were normal. F wave reflex was absent in nerves of both UL and LL (table 2; figure 2). Cervical spine MRI was also performed which revealed no abnormality (table 2).

TREATMENT**Case 1**

Patient was treated with intravenous immunoglobulin (400 mg/kg/day for 5 days).

Table 1 Nerve conduction study in case 1

Nerve	CMAP distal latency (ms)	CMAP amplitude distal/proximal (mV)	MCV (m/s)	Sensory onset latency (ms)	SNAP amplitude (mV)	F-wave latency (ms)
Median						
Right	NR	NR	NR	2.10	30.8	NR
Left	3.80	1.5/0.9	32.6	2.15	25.1	NR
Ulnar						
Right	NR	NR	NR	2.00	34.5	NR
Left	2.70	0.6/0.4	36.6	1.90	25.8	NR
Tibial						
Right	5.85	1.5/0.6	32.0	—	—	NR
Left	6.20	0.8/0.5	53.1	—	—	NR
CPN						
Right	NR	NR	NR	—	—	NR
Left	NR	NR	NR	—	—	NR
Sural						
Right	—	—	—	2.00	37.7	—
Left	—	—	—	2.25	34.0	—

CMAP, compound muscle action potential; CPN, common peroneal nerve; MCV, motor conduction velocity; SNAP, sensory nerves action potential.

Case 2

Patient was managed with intravenous immunoglobulin (0.4 g/kg/day for 5 days).

OUTCOME AND FOLLOW-UP

Case 1

Her weakness improved over next 6 weeks to power of grade 4+.

Case 2

Her weakness improved over next 8 weeks and patient was able to do all her activities. Her follow-up nerve

conduction study was done which was normal without any conduction block.

DISCUSSION

In 1916, Guillain, Barre and Strohl gave description of two patients of acute onset, progressive and predominantly motor weakness which had spontaneous recovery. Although such cases were described previously by Landry in 1859, Guillain et al were first to demonstrate presence of areflexia and albumin-cytological dissociation in CSF examination in such patients.² Since then the number of clinical subtypes of GBS have been described. On the basis of clinical, electrophysiological and pathological

Figure 1 Nerve conduction study of the first patient suggestive of acute axonal motor neuropathy.

Table 2 Nerve conduction study in case 2

Nerve	CMAP distal latency (ms)	CMAP amplitude distal/proximal (mV)	MCV (m/s)	Sensory onset latency (ms)	SNAP amplitude (mV)	F-wave latency (ms)
Median						
Right	2.95	10.1/2.5	52.5	2.15	60.5	NR
Left	3.25	5.5/1.6	54.8	2.20	59.1	NR
Ulnar						
Right	3.05	3.8/0.7	60.8	1.95	56.4	NR
Left	3.10	4.7/0.9	50.5	1.85	59.4	NR
Tibial						
Right	5.80	1.8/0.7	47.8	—	—	NR
Left	5.85	1.5/0.6	47.1	—	—	NR
CPN						
Right	5.00	4.5/2.0	48.3	—	—	NR
Left	6.15	2.6/1.0	43.3	—	—	NR
Median						
Right	—	—	—	1.05	53.5	—
Left	—	—	—	1.95	46.2	—

CMAP, compound muscle action potential; CPN, common peroneal nerve; MCV, motor conduction velocity; SNAP, sensory nerve action potential.

findings GBS is divided into several subtypes.³ But two major subtypes of GBS are acute inflammatory demyelinating polyneuropathy and AMAN. Although demyelinating variety is more commonly encountered in western countries, an axonal form of GBS (AMAN) is increasingly being recognised in China and Japan.⁴ Antecedent *Campylobacter jejuni* enteritis and antiganglioside IgG antibodies usually accompanies AMAN variety.⁵ Although hyporeflexia or absent reflexes is considered to be a essential for GBS, the presence of normal or even brisk reflexes is a finding which is not inconsistent with diagnosis

of GBS. The subtypes of GBS like AMAN, acute facial diplegia with hyper-reflexia and acute motor conduction block neuropathy are likely to be associated with preserved or brisk reflexes.^{3 4 6} Recently few authors have demonstrated preserved reflexes or hyper-reflexia in axonal variety of GBS in Chinese, Japanese and European population.³ The incidence of hyper-reflexia in AMAN has been reported to vary from 33% to 48%.^{3 4} Yuki and Hirata⁷ reported four patients with AMAN who had preserved tendon reflexes (two having brisk reflexes). Despite few case reports this variant is still uncommon in the Indian

Figure 2 Nerve conduction study of the second patient revealed axonal motor neuropathy with conduction block.

subcontinent.⁸ Although sparing of sensory afferent pathways may account for preservation of reflexes in AMAN, presence of hyperreflexia may point towards a central mechanism. The possibility of dysfunction of spinal inhibitory interneurons or upper motor neurons has been proposed.⁴ Kuwabara *et al*⁴ proposed that in AMAN, especially when it is anti-GM1 positive, the motor neuron hyperexcitability might account for brisk reflexes in acute phase. Hence it is proposed that the criteria of areflexia should only be considered in sensori-motor forms of GBS.³

Our second patient had AMAN with motor conduction blocks. The motor conduction block has been found to occur in 2–15% patients with GBS in acute phase.³ The common sites at which conduction block occurs are distal motor nerves, entrapment sites and proximal segments. The damage to blood-nerve barrier at these sites may make the nerve more susceptible to immunological attack and hence the conduction block.³ Although conduction block is a feature of demyelination, it can be seen in AMAN. Griffin *et al*⁹ demonstrated that earliest change in AMAN on electron microscopy is deposition of complement at the nodes of Ranvier causing disruption of paranodal myelin and occasionally leading to the breakdown of the outermost loops of myelin and hence the conduction block and in severe cases is followed by wallerian degeneration. Clinically conduction block may be reversible leading to rapid resolution of weakness.⁵ Apart from variant of GBS the main differential diagnosis in acute motor neuropathy with conduction block is acute onset of chronic multifocal motor neuropathy (MMN). The differentiating feature is that in chronic MMN, conduction block persists for more than 3 months in the same nerves irrespective of clinical evolution and is usually assymetrical whereas in GBS variant, conduction block is not observed in same nerves on serial studies and resolves with clinical improvement. The another differentiating feature is that antibody in chronic MMN is IgM anti-GM1 and that in AMAN is IgG anti-GM1.¹⁰

In our patient, in view of symmetrical presentation, presence of IgG anti-GM1 antibody recovery over a period of 8 weeks makes diagnosis of GBS variant of AMAN with conduction block more likely. Through these two cases, we want to highlight upon these two uncommon GBS variants and the fact that preserved or even brisk reflexes does not exclude the diagnosis of GBS in appropriate clinical settings. Such cases should be carefully evaluated with electrophysiological studies and also to rule out any central cause of brisk reflexes so that appropriate treatment can be instituted.

Learning points

- ▶ Guillain-Barre syndrome (GBS) is an acute, acquired and autoimmune polyradiculoneuropathy clinically characterised by acute, usually ascending, flaccid paralysis and areflexia.
- ▶ Electrophysiological tests assume great importance in diagnosis of GBS which may show either demyelinating or less commonly axonal pattern of involvement with absence of late responses (F wave and H reflex) in early stages. Conduction blocks are usually seen in demyelinating type.
- ▶ Despite such typical presentation in most of the patients, sometimes GBS may present with clinically or electrophysiologically variant findings such as preserved or even brisk reflexes, acute motor axonal neuropathy with reversible conduction block.
- ▶ Preserved or even brisk reflexes does not exclude diagnosis of GBS.
- ▶ Clinicians must be aware of such clinical and electrophysiological variants of GBS so that such patients will not be deprived of appropriate treatment which could be life saving in some cases.

Competing interests None.

Patient consent Obtained.

REFERENCES

1. **Asbury AK**, Cornblath DR. Assessment of current diagnostic criteria for Guillain-Barre syndrome. *Ann Neurol* 1990;**27**(Suppl):S21–4.
2. **Winer JB**. Guillain-Barré syndrome: clinical variants and their pathogenesis. *J Neuroimmunol* 2011;**231**:70–2.
3. **Capasso M**, Caporale CM, Pomilio F, *et al*. Acute motor conduction block neuropathy. Another Guillain-Barré syndrome variant. *Neurology* 2003;**61**:617–22.
4. **Kuwabara S**, Ogawara K, Koga M, *et al*. Hyperreflexia in Guillain-Barré syndrome: relation with acute motor axonal neuropathy and anti-GM1 antibody. *J Neurol Neurosurg Psychiatry* 1999;**67**:180–4.
5. **Kokubun N**, Nishibayashi M, Uncini A, *et al*. Conduction block in acute motor axonal neuropathy. *Brain* 2010;**133**:2897–908.
6. **Susuki K**, Atsumi M, Koga M, *et al*. Acute facial diplegia and hyper-reflexia: a Guillain-Barré syndrome variant. *Neurology* 2004;**62**:825–7.
7. **Yuki N**, Hirata K. Preserved tendon reflexes in Campylobacter neuropathy (letter). *Ann Neurol* 1998;**43**:546–7.
8. **Somarajan A**. Guillain Barre syndrome with brisk reflexes—another variant. *Neural India* 2006;**54**:215–16.
9. **Griffin JW**, Li CY, Macko C, *et al*. Early nodal changes in the acute motor axonal neuropathy pattern of the Guillain-Barré syndrome. *J Neurocytol* 1996;**25**:33–51.
10. **Lefaucheur J-P**. Acute neuropathy with multiple motor conduction blocks: a variant of Guillain-Barré syndrome or multifocal motor neuropathy with conduction blocks with acute onset? *Clinical Neurophysiol* 2008;**38**:209–10.

Copyright 2012 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Verma R, Chaudhari TS. Two unusual variants of Guillain-Barre syndrome. *BMJ Case Reports* 2012;10.1136/bcr-2012-007088, Published XXX

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow