eNeurologicalSci 18 (2020) 100224

Contents lists available at ScienceDirect

eNeurologicalSci

journal homepage: www.elsevier.com/locate/ensci

Case report

Treatment-related fluctuations in subacute inflammatory demyelinating polyneuropathy

Young Gi Min[a], Yoon-Ho Hong[b,*]

[a] Department of Neurology, Seoul National University Hospital, Seoul, South Korea
[b] Department of Neurology, Seoul National University College of Medicine, Neuroscience Research Institute, Seoul National University Medical Research Council, Seoul National, Republic of Korea, University-Seoul Metropolitan Government Boramae Medical Center, Seoul, South Korea

ARTICLE INFO

Keywords:
Guillain-Barre syndrome
Treatment-related fluctuation
Subacute inflammatory demyelinating polyneuropathy
Chronic inflammatory demyelinating polyneuropathy

ABSTRACT

Treatment-related fluctuation (TRF), only defined in Guillain-Barre syndrome (GBS), refer to the deterioration of symptoms following treatment-induced improvement, and implies disease activity lasting beyond the effect of immunotherapy. Here, we first propose the concept of TRF in subacute inflammatory demyelinating polyneuropathy (SIDP) with description of a corresponding case. A 27-year-old female presented with acute flaccid paralysis, and experienced two sequential episodes of TRF, the latter occurring around 8 weeks from disease onset. She eventually recovered through intravenous immunoglobulin treatment, and has not experienced any further deterioration over the next four years. The concept of SIDP-TRF would resolve the gap between GBS-TRF and acute-onset chronic inflammatory demyelinating polyradiculoneuropathy (CIDP) and help to decide the optimal treatment strategy in a spectrum of idiopathic immune-mediated polyneuropathies.

1. Background

8–16% of patients with Guillain-Barre syndrome (GBS) experience clinical deteriorations after initial improvement or stabilization with immune modulatory treatment [1–4]. To distinguish this from acute-onset chronic inflammatory demyelinating polyradiculoneuropathy (A-CIDP) or recurrent GBS, it is defined as treatment-related fluctuation (TRF) [2]. To our knowledge, however, there is still no clear consensus on how late TRF can occur in GBS, and there are some difficulties in distinguishing A-CIDP from GBS-TRF [3]. Here, we present a case report, proposing the concept of TRF in subacute inflammatory demyelinating polyneuropathy (SIDP) that may bridge the gap between GBS-TRF and acute-onset CIDP.

2. Case description

A 27-year-old woman with unremarkable medical history and no recent infections presented with acute onset weakness. Neurological examination revealed areflexic quadriparesis (MRC grade IV, all extremities) and right peripheral type facial palsy. Cerebrospinal fluid analysis revealed albuminocytologic dissociation (3 white blood cells/μl, protein 104.2 mg/dL and glucose 78 mg/dL). Serial nerve conduction studies were consistent with demyelinating polyneuropathy with bilateral facial nerve involvement (Table 1). GM1, GD1b, and GQ1b antibodies, both IgM and IgG, were negative.

Intravenous immunoglobulin (IVIg) was administered 400 mg/kg/day (days 16–20 post-symptom-onset). She showed marked improvement, and was discharged on day 20. Ten days later, she noticed moderate worsening of leg weakness and clumsiness in both hands. She was re-admitted with a diagnosis of GBS-TRF. Her symptoms considerably improved following IVIg administration (days 33–37). However, she experienced another deterioration (about at day 50 and peaked within a week), and was re-admitted at day 66 when neurological examination revealed severe weakness in the bilateral upper and lower extremities (MRC grade II to III). With another IVIg treatment, she improved gradually over the following month and was eventually able to perform daily activities independently. As acute-onset CIDP could not be ruled out, two additional cycles of IVIg were administered (days 142–146, 163–167). No further deterioration was reported over the following four years of follow-up. The overall clinical course is summarized in Fig. 1.

* Corresponding author: 20 Boramaero-5-Gil, Dongjak-Gu, Seoul 07061, South Korea.
E-mail address: nrhong@gmail.com (Y.-H. Hong).

https://doi.org/10.1016/j.ensci.2020.100224
Received 20 November 2019; Received in revised form 28 December 2019; Accepted 25 January 2020
Available online 30 January 2020

Table 1
Results of serial nerve conduction studies. Demyelinating features of prolonged distal latency, increased F-latency, conduction block/temporal dispersion and conduction slowing were identified in multiple motor nerves. Gradual reduction of distal CMAP amplitudes suggests secondary axonal degeneration. Those marked with asterisks indicate respective values from distal/proximal segments.

Nerve	1st admission (Day 14)	1st admission (Day 20)	2nd admission (Day 34)	3rd admission (Day 68)	Reference value (ULN or LLN)
Median motor, left					
Distal latency (ms)	6.9	8.1	15.3	26.1	3.6
CMAP amplitude (mV)*	6.7 / 5.8	6.5 / 5.8	2.0 / 1.8	1.2 / 0.8	5
NCV (m/s)*	53.6 / 61.9	52.3 / 73.5	48.8 / 55.0	48.8 / 68.7	50.0 / 60.0
F-wave latency (ms)	Absent	32.0	Absent	Absent	28.5
Ulnar motor, left					
Distal latency (ms)	5.1	5.4	5.4	14.2	2.5
CMAP amplitude (mV)*	7.9 / 4.2	6.0 / 3.5	2.9 / 0.6	2.7 / 1.5	5
NCV (m/s)*	51.2 / 84.6	52.4 / 36.6	42.7 / 23.9	46.5 / 53.3	50.6 / 58.2
F-wave latency (ms)	Absent	34.0	Absent	Absent	28.6
Tibial motor, left					
Distal latency (ms)	5.6	5.7	8.2	14.0	5.1
CMAP amplitude (mV)*	8.3 / 7.1	5.8 / 4.5	2.4 / 2.1	1.0 / 0.5	4
NCV (m/s)	45.2	37.9	40.0	52.5	40.6
F-wave latency (ms)	Absent	Absent	Absent	Absent	51.8
Peroneal motor, left					
Distal latency (ms)	11.4	12.2	16.6	18.6	4.8
CMAP amplitude (mV)*	2.7 / 2.0	3.5 / 2.7	2.0 / 1.5	1.7 / 0.9	4
NCV (m/s)*	42.6	38.2	40.0	31.8	41.8
F-wave latency (ms)	47.6	53.5	Absent	Absent	47.5
Median sensory, left					
SNAP amplitude (mV)	5	NP	NP	NP	10
NCV (m/s)	48.9	NP	NP	NP	41.3
Ulnar sensory, left					
SNAP amplitude (μV)	8	2	NP	NP	10
NCV (m/s)	42.5	47.2	NP	NP	39.3
Sural sensory, left					
SNAP amplitude (μV)	29	17	9	17	6
NCV (m/s)	44.4	39.3	45.8	38.1	35
Facial motor, left					
Distal latency (ms)	5.9		9.9		3.1
CMAP amplitude (mV)	1.5		2.3		1.1
Facial motor, right					
Distal latency (ms)	5.9		NP		3.1
CMAP amplitude (mV)	1.1		NP		1.1

Abbreviations: ULN, upper limit of normal; LLN, lower limit of normal; CMAP, compound muscle action potential; NCV, nerve conduction velocity; NP, no potential.

3. Discussion

TRF is thought to develop when the disease activity lasts beyond the transient effect of immunomodulation [4]. Because immunomodulatory treatment does not extend the disease process of autoimmune response [6], TRF after four weeks from symptom onset is not consistent with temporal definition of GBS. In this regard, Kleyweg et al. originally suggested four-week time limit to diagnose TRF in GBS [2]. However, Ruts et al. [5] extended this limit to eight weeks, but the rationale for this modification was not provided [3,4,7].

The most remarkable thing in this case is its clinical course that clearly varied with IVIG treatment. Indeed, due to the TRFs, the patient had to be admitted for IVIG treatment three times in total within 2 months after symptom onset. Of note, our case does not fit the GBS-TRF nor acute-onset CIDP. The clinical progression with two episodes of TRF over 2 months is inconsistent with GBS. Although acute-onset CIDP may not be completely ruled out, the clinical nadir occurred within 2 months after symptom onset. In addition, there was no progression or relapse after the last clinical deterioration over the 4 years of follow-up. To our knowledge, there has been no case report on acute-onset monophasic CIDP with TRF.

SIDP is an intermediate disease entity that bridges the temporal gap between GBS and CIDP [8]. Since its disease activity lasts longer than GBS, it is likely that TRF may develop more frequently in SIDP than in GBS. Future studies are warranted to confirm this hypothesis and compare clinical, electrophysiologic and serologic characteristics of GBS-TRF, SIDP-TRF and acute-onset CIDP.

Acknowledging the limitation of case report, we suggest that the concept of SIDP-TRF would help complete categorization of idiopathic immune-mediated polyneuropathies, thereby leading to optimal treatment decision.

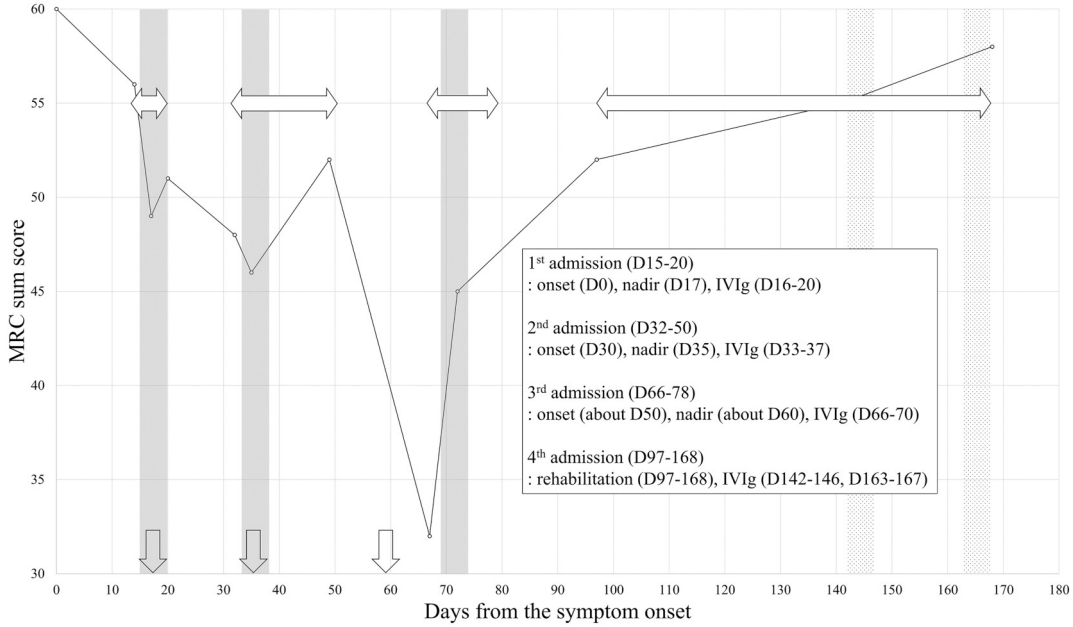

Fig. 1. Summary of the patient's clinical course. The periods of admission are marked with double-sided arrows. Down arrows represent the date of nadirs on each deterioration, the last determined based on the patient's report. The periods of IVIg for rescue therapy are marked with gray bands, while those of 2 additional cycles are marked with dotted bands.
Abbreviations: MRC, Medical Research Council; D, day.

Declarations of Competing Interest

None.

Informed consent

This study was approved by the local institutional review boards. Written informed consent was obtained from the patient.

Acknowledgements

This work was supported by the Collaborative Research Program of SNU Boramae Medical Center and Basic Medical Science from Seoul National University College of Medicine (grant no. 800-20180002).

References

[1] A.H. Ropper, J.W. Albers, R. Addison, Limited relapse in Guillain-Barré syndrome after plasma exchange, Arch. Neurol. 45 (1988) 314–315.
[2] R.P. Kleyweg, F.G.A. van der Meché, Treatment-related fluctuations in Guillain-Barré syndrome after high-dose immunoglobulins or plasma-exchange, J. Neurol. Neurosurg. Psychiatry 54 (1991) 957–960.
[3] L.H. Visser, F.G.A. van der Meché, J. Meulstee, P.A. van Doorn, The Dutch Guillain-Barré study group. Risk factors for treatment-related clinical fluctuations in Guillain-Barré syndrome, J. Neurol. Neurosurg. Psychiatry 64 (1998) 242–244.
[4] L. Ruts, R. van Koningsveld, P.A. van Doorn, Distinguishing acute-onset CIDP from Guillain-Barré syndrome with treatment related fluctuations, Neurology 65 (2005) 138–140.
[5] L. Ruts, J. Drenthen, B.C. Jacobs, P.A. van Doorn, Dutch GBS Study Group, Distinguishing acute-onset CIDP from fluctuating Guillain-Barre syndrome: a prospective study, Neurology 74 (2010) 1680–1686.
[6] N. Inoue, M. Kunishige, S. Yoshida, Y. Oshima, Y. Ohnishi, Y. Kuroda, et al., Dissociation between titer of anti-ganglioside antibody and severity of symptoms in a case of Guillain-Barré syndrome with treatment-related fluctuation, J. Neurol. Sci. 210 (2003) 105–108.
[7] K. Kuitwaard, R. van Koningsveld, L. Ruts, et al., Recurrent Guillain–Barré syndrome, J. Neurol. Neurosurg. Psychiatry 80 (2009) 56–59.
[8] S.J. Oh, K. Kurokawa, D.F. de Almeida, et al., Subacute inflammatory demyelinating polyneuropathy, Neurology 61 (2003) 1507–1512.