Journal of Clinical Neuroscience xxx (2018) xxx–xxx

Contents lists available at ScienceDirect

Journal of Clinical Neuroscience

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

Case study

Outcome in chronic inflammatory demyelinating polyneuropathy from a Malaysian centre over sixteen years

Fu Liong Hiew [a,*], Jun-Jean Ong [b], Shanthi Viswanathan [a], Santhi Puvanarajah [a]

[a] Department of Neurology, Kuala Lumpur Hospital, Jalan Pahang, 50586 Kuala Lumpur, Malaysia[1]
[b] Faculty of Medicine, International Medical University, Jalan Dr Muthu, Bukit Rasah, 70300 Negeri Sembilan, Malaysia

ARTICLE INFO

Article history:
Received 4 July 2017
Accepted 8 January 2018
Available online xxxx

Keywords:
Chronic inflammatory demyelinating polyneuropathy
CIDP Disease Activity Status
Treatment
CIDP outcomes
Medical Research Council (MRC) sum score

ABSTRACT

Long-term outcome in Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) is very limited, especially from Asian countries. We aimed to determine the outcome of our cohort of CIDP patients and to define the relevant clinical, electrophysiological and laboratory determinants of disease activity, progression and treatment response. We retrospectively reviewed records of 23 CIDP patients attending our Neurology service at Kuala Lumpur Hospital, Malaysia between January 2000 and December 2016. We analysed data on neurological deficits, electrophysiological and laboratory parameters to determine diagnostic characteristics, correlation with disease activity and clinical outcomes following treatment. Included were 15 (65%) males and 8 (35%) females with a mean age of 42.7 years (SD 14.4). Mean duration of follow-up visit was 66 months (range 6–134 months). The cohort consists of 19 classical (sensory-motor) CIDP and 4 MADSAM. Large majority of patients (66%) had either stable active disease (CDAS 3, 44%) or were in remission (CDAS class 2, 22%) following treatment with standard immunotherapies (Intravenous Immunoglobulins, steroids or immunosuppressants). The proportion of CIDP patients in each CDAS class was comparable to published cohorts from North America and Europe. Medical Research Council (MRC) sum score was the only clinical score that differed across CDAS classes ($p = .010$) with significant inverse correlation (Spearman's rho −0.664, $p = .001$). In conclusion, treatment outcomes of our CIDP cohort was comparable to those of published series. Further studies with larger cohort of patients from other parts of Asia are important to determine the long-term outcome of this heterogenous disease in this region.

1. Introduction

CIDP is an acquired immune-mediated chronic progressive or relapsing-remitting polyneuropathy, frequently resulting in severe disability [1]. Despite available effective immune therapies, treatment response varies, and outcome ranging from complete remission to severe refractoriness [2,3]. Long-term treatment outcome of this heterogeneous and dynamic disorder has been complicated by varying definitions and differing scales measuring impairment or disability, thus comparison of treatment outcome is difficult [4]. Traditionally used scales, including Medical Research Centre (MRC) sum score, modified Rankin disability score (mRS) and Hughes' disability scale are relatively insensitive, especially in capturing small but clinically meaningful functional improvement [5]. Assessment by validated disability scales such as Overall Neuropathy Limitation scales (ONLS) and more recently patient-reported outcome measures (PROMs) such as the Inflammatory Rasch-built Overall Disability Scale (I-RODS) has been found to be more specific in capturing limitations in patients with immune-mediated neuropathies [5–7]. However, clinical examination findings, although objective, does not necessarily always correlate with disease activity [8]. On the other hand, despite proven objectivity, the validity and reliability of PROMs have been regarded by some to be subjective [7,9].

An international collaborative study of experts in inflammatory neuropathies from the GBS-CIDP Foundation International Medical Advisory Board published in 2010 the CIDP Disease Activity Status (CDAS) aimed to standardize the long-term outcomes in CIDP [4]. Since its introduction, CDAS has been applied in various European and North America CIDP cohorts and has demonstrated to correlate with various motor and functional scores, as well as electrophysiology findings of CIDP [4,8,10–12]. It is considered simple to use and is a reproducible uniform grading system with excellent inter-rater reliability for classification of disease activity in CIDP

* Corresponding author.
E-mail address: hiewfl@gmail.com (F.L. Hiew).
[1] Study site.

https://doi.org/10.1016/j.jocn.2018.01.018
0967-5868/

patients based on treatment status and duration, as well as neurological findings on follow-up [4]. To our understanding, data on long-term CIDP outcome from other parts of the world, including Asia is very limited.

We aimed to determine the outcome of our cohort of CIDP patients and to define the relevant clinical, electrophysiological and laboratory determinants of disease activity, progression and treatment response. We then make comparison of treatment outcomes of our CIDP cohort with that of previously published series.

2. Materials and methods

We retrospectively reviewed the clinical, laboratory and electrophysiology records of patients with diagnosis of CIDP attending our neurology and neurophysiology services at Kuala Lumpur Hospital, Malaysia between January 2000 and December 2016. We included patients meeting diagnostic criteria of the European Federation of Neurological Societies/Peripheral Nerve Society (EFNS/PNS) for definite and possible CIDP [13]. This analysis, conducted on patients with de-identified personal data, was part of a clinical audit on diagnosis and treatment outcomes of our cohort of patients with various forms of inflammatory neuropathy and was registered by National Medical Research Register, Malaysia (NMRR ID number: NMRR-17-26-34063).

We determined relevant information on demographic, clinical presentation, positive physical signs, nerve conduction studies and related laboratory results leading to the diagnosis of CIDP. Electrophysiological records were analysed in relation to main parameters, namely compound muscle action potential amplitude (CMAP), motor conduction velocity (MCV), distal motor latency (DML), conduction block (CB), and F wave latency. Among supportive laboratory tests available in our centre were MRI imaging (enlarged and/or enhanced nerve roots), cerebrospinal fluid (CSF) analysis (acellular CSF with elevated protein) and nerve biopsy (features of demyelination).

As disease status and response to treatment of our CIDP patients was in the past assessed by differing classical clinical scales measuring impairment or disability, we included in our data collection Medical Research Council sum score (MRCSS, Total of 60), modified Rankin score (mRS), Hughes's disability score, and main electrophysiology parameters namely CMAP sum score (CMAPSS) [14–16]. We subsequently rated our cohort using CDAS, corresponding to the individual disease status at the time of analysis. Treatment response was judged based on conclusion from analysis on combination of data from clinical features, laboratory testing, electrodiagnostic data when available upon follow-up evaluation. We subsequently compared our results to published series.

Statistical analysis was performed using SPSS version 20 for Windows. Cohort characteristics were described using proportions, mean ± SD for continuous data, or as frequency and percent for categorical data. Differences in proportion were determined using Fisher's exact test. Continuous variables were assessed for normality (Shapiro-Wilk). Associations between clinical and electrophysiological characteristics and CDAS grade were assessed using ANOVA (for normally distributed variables), the Kruskal-Wallis test (for non-parametrically distributed variables), or the χ^2-test (for categorical data). Significance was set at an α-level of 0.05.

3. Results

We reviewed and analysed a total of 23 patients with CIDP from Kuala Lumpur Hospital fulfilling EFNS/PNS criteria for definite or probable CIDP. Demographic characteristics for the entire cohort of patients are shown in Table 1. There were 15 (65%) males and 8 (35%) females. Less than 10% (2/23) of our CIDP patients presented after the age 65, with mean age at presentation of 42.7 years (SD 14.4). All of them had repeated visits to our neurology service, allowing us to rate CDAS. Mean duration of follow-up visit was 66 months, with shortest duration being 6 months in one patient (Median 52, range 6–134 months).

The cohort consists of 19 classical (sensory-motor) CIDP and 4 MADSAM. Overall, 83% (19/23) of treated patients had long term stable disease, consisting of 6 (26%) off treatment (CDAS 1&2) and 13 (56%) having stable (CDAS 3) or improving disease status (CDAS 4) on treatment (10 and 3 patients respectively). Four (17%) patients in CDAS 5 having unstable active disease had abnormal examination. They were either untreated at the time of classification (2/23, 9%) or refractory to previously administered immune therapy (2/23, 9%). Only one patient (4%) remained asymptomatic with normal neurological examination without treatment since 2011 to be considered as cured (CDAS 1A, mean follow up was 70 months). Among the 5 patients in CDAS 2, 4 had persistent abnormal symmetrical sensory functions.

For analysis of demographic and clinical characteristics according to CDAS rating, we combined patients in Class 1 and 2 due to the small number of patients in both classes and similarity in

Table 1
Demographic characteristics for the entire cohort of patients.

	CDAS classes	All patients	CDAS 1 & 2	CDAS 3	CDAS 4	CDAS 5	p-value
	n (%)	23	6 (26%)	10 (44%)	3 (13%)	4 (17%)	
CDAS classes			1A 1 (4%) 1B 0 (0%) 2A 1 (4%) 2B 4 (17%)	3A 0 (0%) 3B 10 (44%)	4A 0 (0%) 4B 3 (13%)	5A 0 (0%) 5B 2 (9%) 5C 2 (9%)	
Demographics							
Mean age at presentation	Years (SD)	42.7 SD 14.4	35.0 SD 9.0	48.4 SD 13.8	46.0 SD 4.0	37.3 SD 22.8	.268
	≤65 years	21 (91%)	6 (100%)	9 (90%)	3 (100%)	3 (75%)	.528
	>65 years	2 (9%)	0 (0%)	1 (10%)	0 (0%)	1 (25%)	
Gender	Male	15 (65.2%)	2 (33%)	7 (70%)	3 (100%)	3 (75%)	.207
Comorbidity	Diabetes Mellitus	7 (30.4%)	1 (17%)	3 (30%)	2 (67%)	0 (0%)	.484
	Hypertension	8 (34.8%)	1 (17%)	4 (40%)	1 (33%)	1 (25%)	.706
	Dyslipidemia	3 (13%)	0 (0%)	2 (20%)	0 (0%)	1 (25%)	.516
	Coronary Heart Disease	3 (13%)	0 (0%)	1 (10%)	2 (67%)	1 (25%)	.462
EFNS Criteria (Definite CIDP)		21 (91%)	6 (100%)	8 (80%)	3 (100%)	4 (100%)	.416
Disease duration (Mean)	Months (SD)	77.4 SD 67.1	40.8 SD 20.6	86.6 SD 69.0	103 SD 128.2	89.8 SD 56.8	.199
Follow up duration (Mean)	Months (SD)	65.7 SD 67.6	36.5 SD 20.8	78.5 SD 73.3	85.7 SD 133.7	65.7 SD 67.6	.477

Please cite this article in press as: Hiew FL et al. Outcome in chronic inflammatory demyelinating polyneuropathy from a Malaysian centre over sixteen years. J Clin Neurosci (2018), https://doi.org/10.1016/j.jocn.2018.01.018