P380

Incremental economic and clinical burden of illness among adults with chronic inflammatory demyelinating polyneuropathy in the United States

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INTRODUCTION

- Chronic inflammatory demyelinating polyneuropathy (CIDP) is a rare, immune-mediated peripheral neuropathy characterized by demyelination of motor and sensory nerves, leading to symmetrical limb weakness, sensory loss, and diminished reflexes in a progressive or relapsing-remitting course.[1,2]
- CIDP has a profound impact on patients' functional status and exerts substantial clinical and economic burden in affected patients. CIDP has been associated with increased healthcare resource utilization in outpatient ancillary services, radiology services, and specialized drug treatments.[3,4]
- Several real-world studies on the economic and clinical burden of CIDP highlight the need for updated research, as existing literature is limited, and may not accurately reflect the current disease landscape.[3-6]

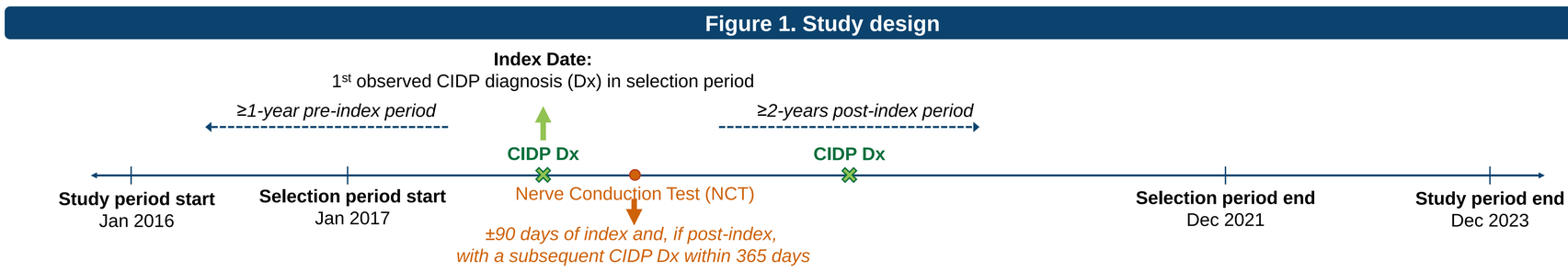
OBJECTIVES

- To evaluate the incremental economic burden (all-cause costs and healthcare resource utilization [HRU]), and clinical burden among patients with CIDP compared with matched controls without CIDP.

METHODS

- This retrospective cohort study utilized Optum's de-identified Market Clarity Data (Optum® Market Clarity) from 2016 to 2023, encompassing pharmacy, medical, and administrative claims from multi-payer sources covering over 72 million patients in the United States (US) (**Figure 1**).

Figure 1. Study design



Patients with CIDP were selected based on

- Adult patients with ≥2 CIDP diagnosis (Dx) between Jan 2017 – Dec 2021, ≥30 - ≤365 days apart (first observed Dx claim is defined as the index date)
- Patients with ≥1 nerve conduction test ≤90 days before or after index, with ≥1 CIDP Dx claim following it within 365 days
- Patients with continuous enrollment ≥1 year pre- and ≥2 years post-index date

Non-CIDP matched controls were selected based on

- Adult patients without a CIDP Dx throughout the study period (Jan 2016 – Dec 2023). Direct matching was employed using age, gender, and geographic region to assign an index date
- Continuous enrollment ≥1 year pre- and ≥2 years post-index date
- Propensity score (PS) matching was employed to minimize standard mean difference (SMD) <0.10 between the CIDP and non-CIDP cohorts

Patients with CIDP were 1:3 PS-matched* to controls without CIDP

Exclusion criteria

- ≥2 claims of the same exclusionary conditions** during the 1-year pre- and 2-year post- index period

Study outcomes during 2-year follow-up period

- All-cause HRU and costs
- Comorbidities

Statistical analysis

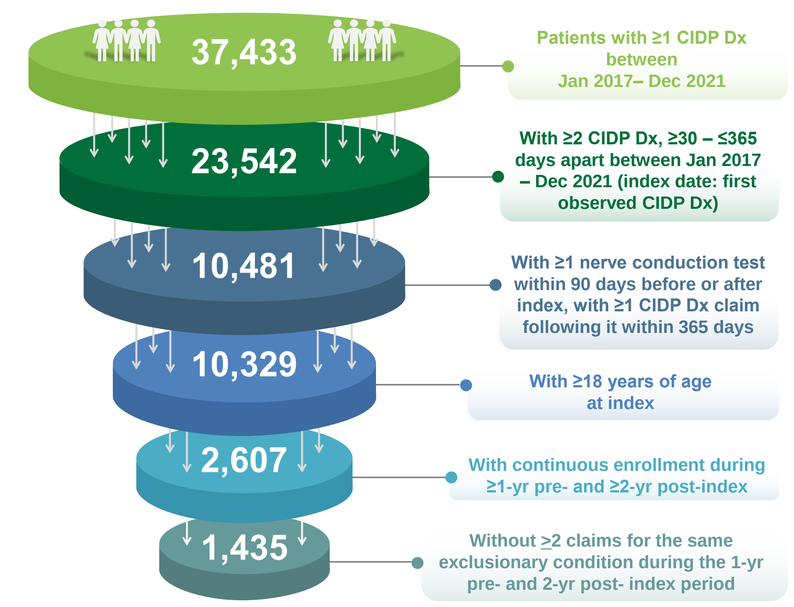
- Outcomes were compared between matched cohorts using generalized linear models
- Statistical significance was defined as p<0.05 *a priori*

*Baseline covariates for PS matching: Age, gender, race, ethnicity, geography, CCI score, insurance status, and top 5 comorbidities that are CIDP risk factors (diabetes with chronic complications, osteoarthritis, hypothyroidism, hypertension, hypercholesterolemia). **Exclusionary diagnoses included amyloidosis, amyotrophic lateral sclerosis, autoimmune hemolytic anemia, B12 deficiency, celiac disease, chronic lymphocytic leukemia, dermatomyositis, fibromyalgia, Guillain-Barre syndrome, familial neuropathy, human immunodeficiency virus, immune thrombocytopenic purpura, inclusion body myositis, bone marrow transplant, Kawasaki disease, multifocal motor neuropathy, multiple myeloma, multiple sclerosis, myasthenia gravis, necrotizing fasciitis, nonfamilial hypogammaglobulinemia, primary secondary immunodeficiency, sarcoidosis, organ transplant, systemic lupus erythematosus, toxic neuropathy, and cancer chemotherapy, paraneoplastic syndrome.
CIDP: Chronic inflammatory demyelinating polyneuropathy; Dx: Diagnosis; NCT: Nerve conduction test

RESULTS

- A total of 1,435 patients with CIDP and 4,305 non-CIDP matched controls were included in the study **(Figure 2)**.

Figure 2. Patient selection



- The mean (SD) age of the CIDP cohort was 60.3 (14.7) years.
- The CIDP cohort was predominantly male (61%), with a mean (SD) Charlson Comorbidity Index (CCI) score of 2.0 (2.2) **(Table 1)**.
- The CIDP cohort had a higher prevalence of several comorbidities compared to their matched controls, including neuropathic pain (90%), back pain (50%), sleep disorder (30%), anxiety (27%) and depression (22%).

Table 1. Baseline patient demographics and clinical characteristics

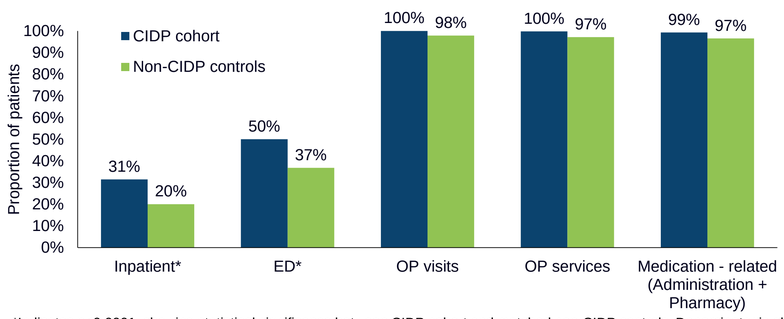
Baseline Characteristics	CIDP Cohort (N = 1,435) N, %	Non-CIDP Controls (N = 4,305) N, %	SMD*
Age			
Mean (SD), years	60.3 (14.7)	61.6 (13.1)	
18-40	149 (10)	287 (7)	
41-65	742 (52)	2,399 (56)	0.09
65+	544 (38)	1,619 (38)	
Gender			
Male	874 (61)	2,637 (61)	0.01
CCI score			
Mean (SD)	2.0 (2.2)	2.0 (2.3)	0.01
Payer channel			
Commercial	638 (44)	2,074 (48)	
Medicare	561 (39)	1,667 (39)	
Medicaid	118 (8)	294 (7)	0.05
Unknown	117 (8)	268 (6)	
Multiple	1 (0)	2 (0)	
Specific comorbidities used in PS-matching			
Hypertension	894 (62)	2,822 (66)	0.07
Hypercholesterolemia	862 (60)	2,796 (65)	0.10
Osteoarthritis	491 (34)	1,485 (34)	0.01
Diabetes w/ chronic complications (CC)	335 (23)	885 (21)	0.07
Hypothyroidism	309 (22)	1,010 (23)	0.05
Additional comorbidities with ≥15% prevalence in CIDP cohort at baseline			**p-value**
Neuropathic pain	1,285 (90)	1,037 (24)	<0.0001
Back pain	719 (50)	1,110 (26)	<0.0001
Diabetes w/o CC	456 (32)	1,465 (34)	0.125
Sleep disorder	428 (30)	943 (22)	<0.0001
Anxiety	393 (27)	855 (20)	<0.0001
Depression	310 (22)	702 (16)	<0.0001
Chronic pulmonary disease	289 (20)	934 (22)	0.226
Coronary artery disease	273 (19)	896 (21)	0.156
Peripheral vascular disease	266 (19)	650 (15)	0.002
Cerebrovascular disease	236 (16)	438 (10)	<0.0001

*All covariates (except hypercholesterolemia) that were included in the PS-model have SMD<0.10 threshold post-match suggesting that the cohorts are well-balanced; all data are expressed as n (%), unless mentioned otherwise.
CIDP: Chronic inflammatory demyelinating polyneuropathy; CC: Chronic complications; CCI: Chronic comorbidity index; PS: propensity score; SD: standard deviation; SMD: standard mean difference

Healthcare resource utilization (HRU) over 2-year follow-up period

- A significantly higher proportion of patients in the CIDP cohort received care in inpatient or emergency department (ED) settings, compared to the matched controls **(Figure 3)**.
- In the outpatient setting, a higher proportion of patients in the CIDP cohort had care associated with surgical procedures (87% vs 71%), diagnostics (93% vs 75%), occupational therapy/physical therapy (OT/PT; 58% vs 33%), physical medicine (28% vs 16%) and ancillary/radiology services (96% vs 87%), compared to the matched controls (p<0.0001 for all).
- Patients in the CIDP cohort exhibited significantly higher all-cause mean HRU (~2-2.5x) as compared to matched controls across all healthcare settings, including all OP settings **(Table 2)**.

Figure 3. Proportion of patients with all-cause HRU over 2-year follow-up



*Indicates p<0.0001, showing statistical significance between CIDP cohort and matched non-CIDP controls. Denominator is all patients.
OP services includes utilization of services such as laboratory, pathology, radiology, ambulance, durable medical equipment etc; OP visits includes outpatient setting surgery, physician office, diagnostic and physical medicine/rehab visits; medication-related includes both pharmacy fills and medications administered in the outpatient office setting (ex: infusions)
CIDP: Chronic inflammatory demyelinating polyneuropathy; ED: Emergency department; HRU: Healthcare resource utilization; OP: Outpatient

Table 2. All-cause HRU over 2-year follow-up

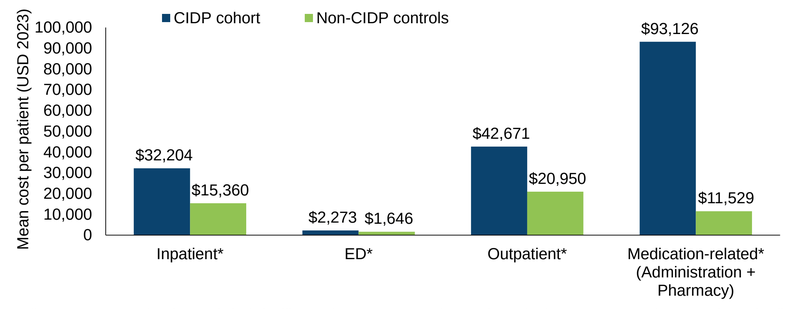
HRU categories, Mean (SD)	CIDP Cohort (N = 1,435)	Non-CIDP Controls (N = 4,305)	p-value
Inpatient visits	0.8 (2.0)	0.4 (1.4)	<0.001
Emergency department visits	1.2 (2.1)	0.8 (3.0)	<0.001
Medication-related (Administration + Pharmacy fills)	125.9 (105.7)	71.5 (77.8)	<0.001
Outpatient encounters			
Surgery visits	6.2 (7.8)	3.4 (4.9)	<0.001
Physician office visits	25.7 (16.7)	13.8 (13.1)	<0.001
Diagnostic visits	5.4 (7.8)	3.4 (6.2)	<0.001
OT/PT visits	10.8 (21.4)	4.2 (11.8)	<0.001
Physical medicine/ rehab visits	4.2 (13.7)	2.0 (8.5)	<0.001
Lab/pathology services	74.9 (73.6)	38.1 (52.2)	<0.001
Ancillary/radiology services*	37.6 (45.1)	22.1 (36.8)	<0.001

*Ancillary includes claims for durable medical equipment and transportation services, like ambulance
CIDP: Chronic inflammatory demyelinating polyneuropathy; HRU: Healthcare resource utilization; OT/PT: Occupational/ physical therapy; SD: standard deviation

All-cause costs over 2-year follow-up period

- Patients in the CIDP cohort had 3.4 times higher mean all-cause total cost of care over 2-year follow-up period, compared to matched controls ($170,275 vs $49,486; p<0.0001).
- Patients in the CIDP cohort had significantly higher mean all-cause costs across all categories, compared to matched controls (**Figure 4)**.

Figure 4. All-cause costs over 2-year follow-up

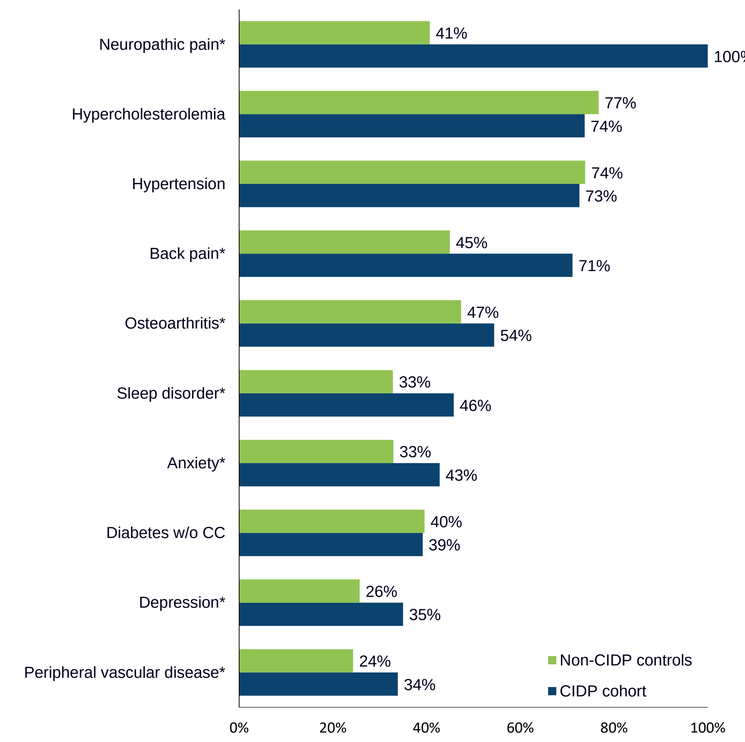


*Indicates p<0.0001, showing statistical significance between CIDP cohort and matched non-CIDP controls. Denominator is all patients.
CIDP: Chronic Inflammatory demyelinating polyneuropathy; ED: Emergency department

Clinical burden at 2-year follow-up

- Despite being matched on CCI at baseline, CIDP cohort had a significantly higher mean CCI score at the end of the two-year follow-up compared to their matched controls (CCI: 2.9 vs. 2.4; p<0.0001).
- Among the top 10 comorbidities (based on prevalence in the CIDP cohort) evaluated, the largest differences between the two cohorts were observed in prevalence of neuropathic pain, backpain, sleep disorder, anxiety and peripheral vascular disease, at the end of the follow-up period **(Figure 5)**.

Figure 5. Prevalence of top 10 comorbidities at 2-year follow-up



*Indicates p<0.05, showing statistical significance between CIDP cohort and matched non-CIDP controls.
CIDP: Chronic inflammatory demyelinating polyneuropathy; CC: Chronic Complications

CONCLUSIONS

Patients with CIDP had a significantly higher economic and clinical burden over a 2-year follow-up period, compared to their matched controls without CIDP.

Mean total all-cause healthcare costs for patients with CIDP were 3x those of matched controls over a 2-year follow-up period, highlighting the significant economic burden for patients, as well as the healthcare system.

Beyond economic burden, patients with CIDP experience a higher comorbidity burden at 2-year follow-up.

Limitations

- This study captures only the direct burden of CIDP using administrative claims data and does not account for indirect impacts due to loss of productivity, employment, and quality of life.
- Findings may not fully represent the broader global or national CIDP population due to variations in healthcare systems, insurance coverage, and regional treatment practices.

ABBREVIATIONS: CC, chronic complications; CCI, Charlson Comorbidity Index; CIDP, Chronic Inflammatory Demyelinating Polyneuropathy; ED, Emergency Department; HRU, Healthcare Resource Utilization; IG, Immunoglobulin; IVIG, Intravenous Immunoglobulin; OP, Outpatient; OT/PT, Occupational Therapy/ Physical Therapy; PS, Propensity Score; SCIG, Subcutaneous Immunoglobulin; NCT, Nerve Conduction Test; SD, Standard Deviation; SMD, Standard Mean Difference; US, United States.

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