Burden of illness for adults with chronic inflammatory demyelinating polyneuropathy in the United States

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Introduction and Purpose

- Chronic inflammatory demyelinating polyneuropathy (CIDP) is a rare, immune-mediated disorder of the peripheral nervous system characterized by sensory loss, muscle weakness, imbalance, impaired ambulation, and fatigue.[1,2]
- The first-line treatments for CIDP include immunoglobulin (Ig), steroids, and plasma exchange (PLEX).[3]
- CIDP imposes substantial burden on patients and caregivers due to impaired physical function, and challenges associated with diagnosis, access, and management often contribute to increased healthcare resource utilization (HCRU).[2-4]
- There is a current knowledge gap in updated evidence on the burden of CIDP in the United States (US), based on a robust real-world sample. Particularly, better understanding of cost drivers is critical to provide insight into areas of addressable unmet need in CIDP.
- The objective of this study was to evaluate the burden (HCRU and costs) of patients living with CIDP in the US to identify drivers of pronounced burden and areas of unmet need.

Methods

- A retrospective cohort study was conducted using Komodo Health (a US-based claims database, containing complete medical and prescription claims information from 150 payers across all geographic regions in the US from January 2016 to December 2020; **Figure 1**).

Figure 1. Study design

Key patient selection criteria

- ≥2 claims with CIDP diagnosis, ≥30–≤365 days apart (first observed CIDP diagnosis was considered as index date)
- Continuous enrollment ±1 year pre- and post-index date
- ≥1 nerve conduction test[a] present either after the index date and before another CIDP diagnosis, or ≤90 days before the index date
- Age ≥18 years on index date
- Closed claims

Study variables

- Patient baseline characteristics for the overall cohort

Exclusion criteria

- ≥2 of the same exclusionary diagnoses during 2-year study period[b]

Study outcomes

- All-cause and CIDP-related HCRU and costs (overall and by treatment type) in the 1-year post-index period

Statistical analysis

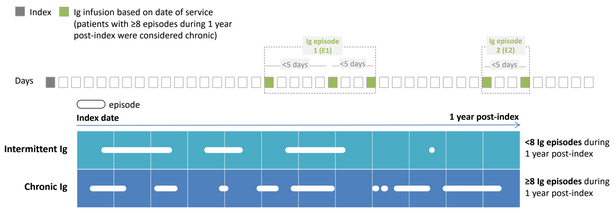
- Descriptive statistics were used to evaluate patient baseline characteristics, HCRU, and costs

[a]A nerve conduction test requirement was added to increase the robustness and certainty of identifying patients with CIDP.
[b]Exclusionary diagnosis includes 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.
CIDP, chronic inflammatory demyelinating polyneuropathy; HCRU, healthcare resource utilization.

Definitions associated with Ig utilization

- **Ig:** Any claims indicating intravenous (IV) or subcutaneous (SC) Ig use were included.
- **Ig episode:** Among patients receiving Ig during 1 year post-index, one Ig episode was defined as a cluster of Ig infusions <5 days apart from one another (**Figure 2**).
- Patients were stratified into 2 cohorts based on the number of Ig episodes during 1 year post-index:
  - **Intermittent Ig:** <8 Ig episodes during 1 year post-index.
  - **Chronic Ig:** ≥8 episodes during 1 year post-index.

Figure 2. Illustration of Ig episodes and classification of Ig users



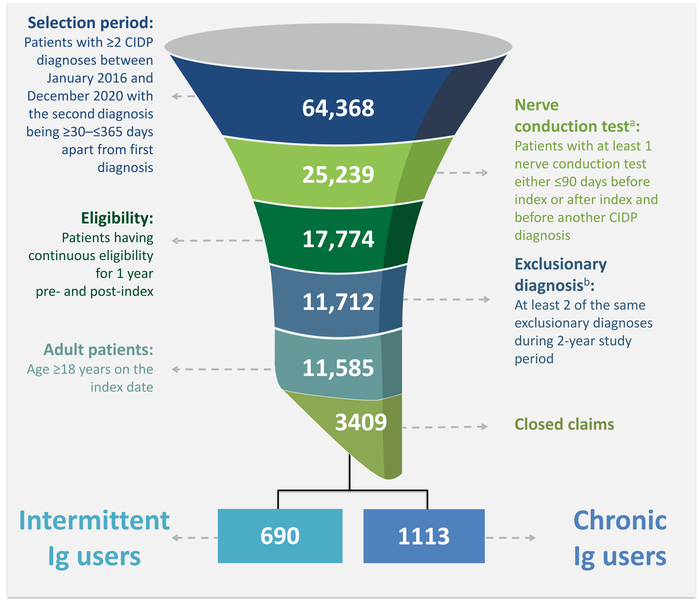
Ig, immunoglobulin.

Results

Patient selection

- Overall, 3409 patients with CIDP were included (**Figure 3**).
- Among 1803 patients who used Ig at least once during the 1-year post-index period, 62% (n=1113) were chronic Ig users and 38% (n=690) were intermittent Ig users (**Figure 3**).

Figure 3. Patient selection



[a]A nerve conduction test requirement was added to increase the robustness and certainty of identifying patients with CIDP.
[b]Exclusionary diagnosis defined in study design.
CIDP, chronic inflammatory demyelinating polyneuropathy; Ig, immunoglobulin.

Baseline demographics and clinical characteristics

- Baseline demographics and clinical characteristics were largely consistent with previous reports[5] (**Table 1**).

Table 1. Baseline demographics and clinical characteristics

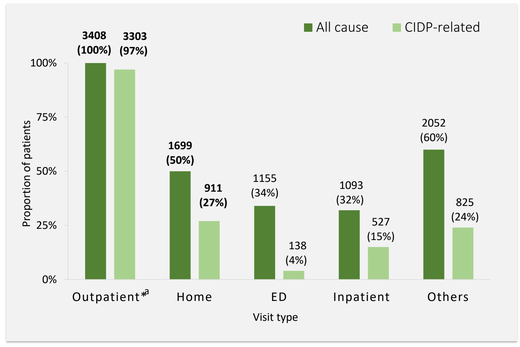
	N=3409
Age, years, mean (SD)	59.4 (13.9)
Distribution by age, n (%)	
18–40	335 (10)
41–65	1932 (57)
65+	1142 (33)
Gender, n (%)	
Male	2055 (60)
Female	1354 (40)
Race and ethnicity, n (%)	
Non-Hispanic Caucasian	1405 (41)
Hispanic	292 (8)
Non-Hispanic African American	162 (5)
Non-Hispanic Asian	25 (1)
Other/unknown	1525 (45)
CCI, mean (SD)	2.0 (2.2)
Insurance, n (%)	
Commercial	1680 (49)
Medicare	934 (27)
Medicaid	460 (13)
Other[a]	335 (10)
Comorbidities, n (%)	
Diabetes without chronic complication	1054 (31)
CPD[b]	753 (22)
Diabetes with chronic complication	720 (21)
Cerebrovascular disease	519 (15)
Peripheral vascular disease	514 (15)
CHF	341 (10)
Any malignancy[c]	313 (9)
Renal disease	282 (8)

[a]Including self-insured, other/unknown, or dual-eligible.
[b]Including bronchitis, emphysema, asthma, chronic obstructive pulmonary disease, bronchiectasis, pneumoconiosis, and chronic drug-induced interstitial lung disorders.
[c]Including lymphoma and leukemia, except malignant neoplasm of skin.
CCI, Charlson Comorbidity Index; CHF, congestive heart failure; CPD, chronic pulmonary disease; SD, standard deviation.

Overall HCRU during 1 year post-index

- Outpatient and home visits accounted for a significant proportion of HCRU, likely driven by the common utilization of Ig treatment (**Figure 4**).
- Approximately half of home and inpatient visits were CIDP related.
- There was a high utilization of costly acute care services where approximately one-third of patients had an all-cause inpatient or emergency department visit in the 1-year post-index period, with an average of 2.3 all-cause ED and 2.4 inpatient visits per patient per year **(Table 2)**.

Figure 4. Patients with at least 1 visit during 1 year post-index



[a]Outpatient visit included evaluation and maintenance visits as well as procedures or injections that take place in an outpatient setting.
[b]Average only includes patients with ≥1 visit of associated call.
ED, emergency department; IQR, interquartile range; SD, standard deviation.

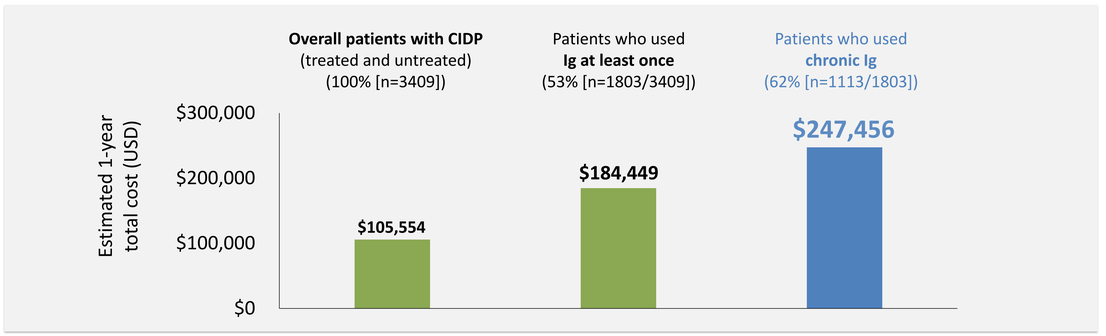
Table 2. Average number of visits per patient per year and length of inpatient stay during 1 year post-index

	All-cause	CIDP related
Average number of visits per patient per year, mean (SD)[b]		
Home	14.0 (28.2)	13.0 (14.7)
Outpatient	31.7 (24.5)	9.1 (10.3)
ED	**2.3 (3.0)**	1.3 (0.8)
Inpatient	**2.4 (3.2)**	2.0 (2.5)
Others	6.8 (13.6)	5.1 (7.0)
Length of inpatient stay, days		
Median (IQR)	4.4 (1–5)	5.9 (1–7)

Drivers of cost in CIDP

- To evaluate drivers of cost in CIDP, all-cause and CIDP-related costs were evaluated by CIDP treatment. Ig was the predominant cost driver in CIDP, comprising a substantial proportion of total all-cause (82% [n= $86,434/$105,554]) and CIDP-related (78% [n=$82,460/$105,554]) costs.
- Among Ig users, the average all-cause cost was substantial, at $184,449 per year. The cost of burden was higher in chronic Ig users, at $247,456 per year, which was greater than 2-fold that of overall all-cause costs ($105,554) (**Figure 5**).

Figure 5. Mean all-cause costs per patient during 1 year post-index



Ig, immunoglobulin; n, number of patients; USD, United States dollar.

Conclusions

- **The overall burden of CIDP was substantial, with costs primarily driven by Ig treatment.**
- **The total cost for chronic Ig users was 2-fold greater than that of overall CIDP, indicating additional burden and unmet need for patients and the healthcare system.**
- **In addition to HCRU and direct costs evaluated in this study, additional unmet need may be associated with common CIDP treatments, including clinical, humanistic, and indirect economic burden.**
- **Further research is critical to identify these needs to better support and improve outcomes for patients with CIDP.**

Limitations

- The burden associated with Ig use captured in this study reflects only the direct medical and pharmacy costs associated with the treatment of CIDP.
- Further research is needed to understand any indirect costs associated with CIDP such as lost productivity and time missed from work/school.
- This study analyzed retrospective data from a claims-based dataset, which is limited in the capture of information such disease severity or the rationale for treatment selection.
- The US-based study population may not fully represent the global or national CIDP patient population. Variations in healthcare systems, insurance coverage, and regional treatment practices could limit the generalizability of these findings beyond the studied population.

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