Burden of Idiopathic Multicentric Castleman Disease (iMCD) in the US: A Population-Level Real World Analysis using a Health-Claims Dataset

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Background

- Idiopathic Multicentric Castleman Disease (iMCD) is a rare cytokine-driven disorder characterized by generalized lymphadenopathy and chronic inflammation.
- The epidemiology of iMCD remains poorly understood due to the rarity of the condition and diagnostic complexities.
- Research using real-world data for rare or difficult-to-diagnose conditions are often ideal for conducting analyses on epidemiology, disease burden, and treatment patterns but require accurate patient identification to ensure scientifically rigorous results.
  - International diagnostic criteria were first published in 2017, providing clinicians and researchers consistent guidelines for identifying iMCD patients.[1]
  - A CD-specific ICD-10-CM code (D47.Z2) was added, effective October 2016.
- An earlier analysis in 2021[2] used a health claims-based algorithm that included the ICD-9-CM code for lymph node enlargement or the recently introduced CD-specific ICD-10-CM code in conjunction with an adaptation of international diagnostic criteria[1] to identify patients with iMCD.

Objective

- To refine the previously developed health-claims based algorithm to more accurately capture iMCD cases by exclusively using the CD-specific ICD-10-CM code.
- To analyze trends in the use of siltuximab, which is the sole therapy approved by the Food and Drug Administration for the treatment of iMCD in the US.[3]

Methods

Study Design

- This retrospective cohort study used US administrative claims data from the Merative MarketScan® Research databases.
- The MarketScan Research Databases are de-identified, fully compliant with the Health Insurance Portability and Accountability Act of 1996 and are representative of the US managed-care population.

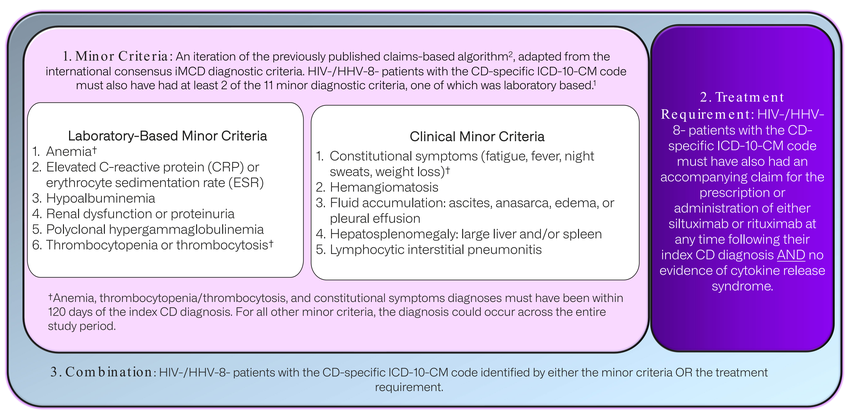
Study Period and Initial Patient Pool

- Patients with at least one medical claim with the CD-specific ICD-10-CM diagnosis code (D47.Z2) during 1-October-2016, through 31-July-2023 (earliest CD diagnosis=index date) were initially selected (initial patient pool).
- Patients with any recorded claims featuring a diagnosis code for human immunodeficiency (HIV) or herpes virus-8 (HHV-8) throughout the study period (1-January-2016, through 31 July-2023) were excluded from the dataset prior to application of the algorithm.

Patient Identification Algorithm

- Patients with iMCD were identified using a three-pronged approach (1. Minor Criteria, 2. Treatment Requirement, 3. Combination). Figure 1 and Figure 2.

Figure 1. Patient Identification Algorithm



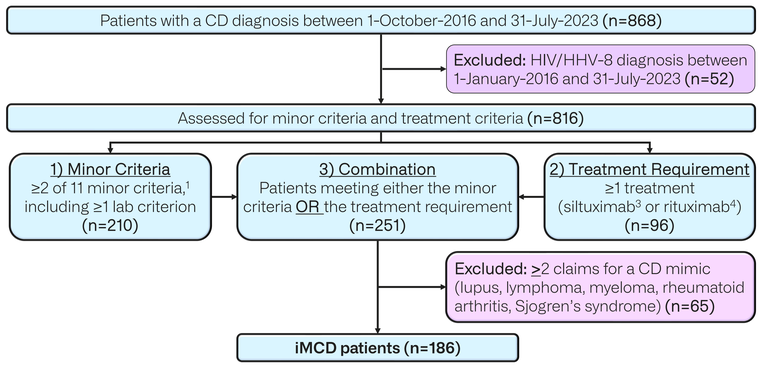
- Following application of the patient identification algorithm, patients with ≥2 claims with an ICD-10-CM diagnosis code for common CD mimics (lupus, lymphoma, myeloma, rheumatoid arthritis, Sjogren's syndrome) were excluded from the final cohort of patients with iMCD.

Results

Algorithm Results

- The initial cohort consisted of 868 patients with a CD diagnosis. After excluding 52 patients with claims containing a diagnosis code for HIV or HHV-8, 816 patients remained in the final dataset (Figure 2).
- After application of the algorithm, it was found that more than twice as many patients were identified using the minor criteria (n=210) vs. the treatment requirement (n=96).
- Combined, 251 (31%) potential iMCD patients were identified by either the minor criteria or the treatment requirement (Figure 2).
- Sixty-Five patients with ≥2 claims with an ICD-10-CM diagnosis code for common CD mimics were excluded from the final cohort of patients with iMCD (Figure 2).
- The study sample comprised 186 patients with iMCD; demographic characteristics are summarized in Table 1.

Figure 2. Algorithm Results; Three-Pronged Approach



Abbreviations: CD: Castleman disease, HHV-8: herpesvirus-8, HIV: human immunodeficiency virus

Table 1. Characteristics of Patients with iMCD

	All iMCD Patients (n=186)
Age (n, %)	
0-34	39 (21.0%)
35-64	121 (65.1%)
65+	26 (14.0%)
Mean age (SD)	49 (17.5)
Sex (n, %)	
Male	96 (51.6%)
Female	90 (48.4%)
Payer (n, %)	
Commercial	160 (86.0%)
Medicare Advantage	4 (2.2%)
Medicare Supplemental	22 (11.8%)
Year of CD diagnosis (n, %)	
2016*	5 (2.7%)
2017	42 (22.6%)
2018	43 (23.1%)
2019	29 (15.6%)
2020	21 (11.3%)
2021	19 (10.2%)
2022	17 (9.1%)
2023†	10 (5.4%)
CD diagnosis status (n, %)	
No prior evidence of enlarged lymph nodes‡	91 (48.9%)
With prior evidence of enlarged lymph nodes‡	95 (51.1%)

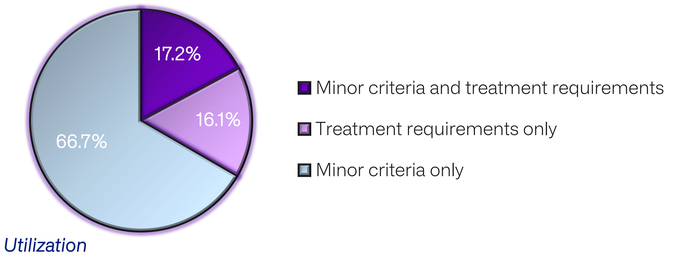
Abbreviations: CD: Castleman disease, SD: standard deviation
*The earliest possible diagnosis date was 1-October-2016 (the date the ICD-10-CM code for CD became available).
†The latest possible diagnosis date was 31-July-2023.
‡ICD-10-CM diagnosis code R590, R591, or R599 between 1-January-2016 and the day before the CD diagnosis date.

Results (cont'd)

Overlap in Algorithm Approaches for Identification of Patients with iMCD

- Among the 186 patients with iMCD, 66.7% (n=124) were identified by meeting the minor criteria only (they did not meet the treatment requirement), 16.1% (n=30) were identified by meeting the treatment requirement only (they did not meet the minor criteria) and 17.2% (n=32) met both the minor criteria and treatment requirement (Figure 3).

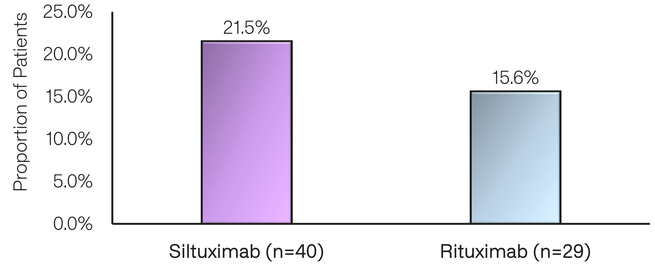
Figure 3. Overlap in Algorithm Approaches for Identification of Patients with iMCD (n=186)



Treatment Utilization

- Among the 186 patients with iMCD, 21.5% (n=40) had a claim for siltuximab and 15.6% (n=29) had a claim for rituximab at any time following the index CD diagnosis date (Figure 4).

Figure 4. Utilization of Siltuximab and Rituximab Among Patients with iMCD (n=186)



Main Strengths and Limitations

- A strength of our algorithm is that it relies on use of the CD-specific ICD-10-CM code in conjunction with international diagnostic criteria and exclusion of CD mimics with the intent of providing the most accurate estimates of prevalent cases.
- By requiring that patients have at least 2 of the 11 minor diagnostic criteria (and requiring that the blood abnormalities and constitutional symptoms be within 120 days of the CD diagnosis), we aimed to reduce misclassification.

Conclusions

- The utility of health-claims based datasets to conduct studies on epidemiology, disease burden and treatment patterns in iMCD is dependent on an accurate patient pool.
- Precise identification of iMCD patients in real-world data should rely on a multi-pronged approach, incorporating diagnostic guidelines[1] as well as treatment-based criteria.
- Siltuximab, the only FDA approved first line therapy for treatment of iMCD[3], use was dismally low at 21.5%, indicating high unmet treatment need.

More information will be presented during Outcomes Research: Non-Malignant Conditions Excluding Hemoglobinopathies: Innovative Approaches to Improve Care for Understudied Non-Malignant Hematologic Diseases, December 9, 2024, 10:30 AM-12:00 PM , Room 6B (San Diego Convention Center).

References

1. Fajgenbaum DC, et al. Blood. 2017;129(12):1646-1657.
2. Mukherjee S, et al. Blood Advances. 2022;6(2):359-367.
3. Sylvant [package insert]. Bridgewater, NJ: Recordati Rare Diseases Inc. 2024.
4. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Castleman Disease V1.2024. National Comprehensive Cancer Network, Inc. 2024. All rights reserved. Accessed November 13, 2024. To view the most recent and complete version of the guideline, go to NCCN.org.

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