PicnicHealth

EPH23

Disease Modifying Therapy (DMT) Utilization and Health Care Resource Utilization (HCRU) Among Adults with Multiple Sclerosis (MS) in a United States-Based Real-World Cohort

Haley S. Friedler, MPH; Joy Chen, MPH; Jennifer R. Dusendang, MPH

Background + Purpose

Background

- Multiple sclerosis (MS) is a progressive autoimmune disorder that affects the central nervous system
- Patients with Multiple Sclerosis (PwMS) have high healthcare resource utilization (HCRU), in part due to relapses[1]
- Several disease modifying therapies (DMTs) are available, which have been shown to reduce annualized relapse rates (ARR) by 29-68%, compared to placebo[2]

Purpose

- This study aimed to describe the use of DMTs and HCRU among adult PwMS receiving care in the United States (US)

Methods

Data Source

- This study analyzed data from the PicnicHealth MS Cohort
  - Records were collected from consented PwMS who receive care in the US
  - MS and general health data were abstracted from structured and narrative portions of the medical record using a novel technology-enabled abstraction platform

Inclusion Criteria

- PwMS who met all of the following criteria were included in the study:
  - Diagnosis of MS, as confirmed in the patient's medical records
  - ≥18 years old at enrollment
  - Enrolled in the PicnicHealth MS Cohort September 2020 through August 2022

Analytical Methods

- Descriptive statistics for patient characteristics, DMT use, and HCRU were reported
- ARR was calculated as the total number of relapses divided by the observed patient time for all patients in the cohort
- Magnetic resonance imaging (MRI) of the central nervous system (CNS), including MRIs of the brain, orbit, head, and spine, were used to define radiologically active disease
  - Radiologically active disease was defined as the patient having active disease or presence of enhancing lesions, as documented in the interpretation of a CNS MRI report

Disclosures

Authors are employees of PicnicHealth

Table 1: Demographics & clinical characteristics of PwMS

Characteristic*	Result (N=2,864)
Age at enrollment (years)	48 (12)
Age at MS diagnosis (years)	37 (11)
Sex	
Female	2,286 (80%)
Male	576 (20%)
Unknown	2
Race	
Black or African American	464 (17%)
White	2,114 (78%)
Other	124 (5%)
Unknown**	162
Ethnicity	
Hispanic or Latino	231 (9%)
Not Hispanic or Latino	2,483 (91%)
Unknown**	150
Geography	
Northeast	508 (18%)
Midwest	671 (23%)
South	1,141 (40%)
West	542 (19%)
Unknown	2
Subtype	
Clinically isolated syndrome	9 (0%)
Primary progressive MS	198 (95)
Progressive MS	93 (4%)
Progressive relapsing MS	60 (3%)
Relapsing remitting MS	1,385 (65%)
Secondary progressive MS	376 (18%)
Unknown	743
Mobility aid usage	
Any mobility aid	1504 (53%)
Cane or walker	1386 (48%)
Wheelchair or scooter	658 (23%)

*continuous variables are reported as mean (standard deviation); categorical variables are reported as N (%)

**Unknown includes missing data and "Prefer not to say"; Of the unknown values, 32 and 135 patients reported "Prefer not to say" for race and ethnicity, respectively

Table 2: HCRU Among PwMS

Category^	Result (N=2,864)
Number of care sites	4 (2, 7)
Number of providers	9 (5, 18)
Specialist utilization (≥1 visit)	
Neurologist	2,755 (95%)
Primary Care	2,238 (78%)
Physical Therapist	871 (30%)
Occupational Therapist	366 (13%)
Visit Utilization (≥ 1 visit)	
Outpatient visit	2,853 (100%)
Inpatient visit	1,680 (59%)
MS-associated procedure utilization	
≥1 MRI of the CNS	2,642 (92%)
≥2 MRI of the CNS ≥ 12 months apart	2,120 (74%)

^continuous variables are reported as Median (Q1, Q3); categorical variables are reported as N (%)

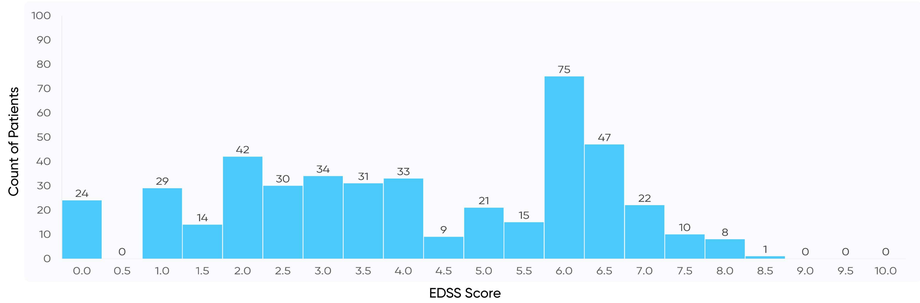

Figure 1: Most Recent EDSS Score Among PwMS With ≥1 EDSS Score (N=447)

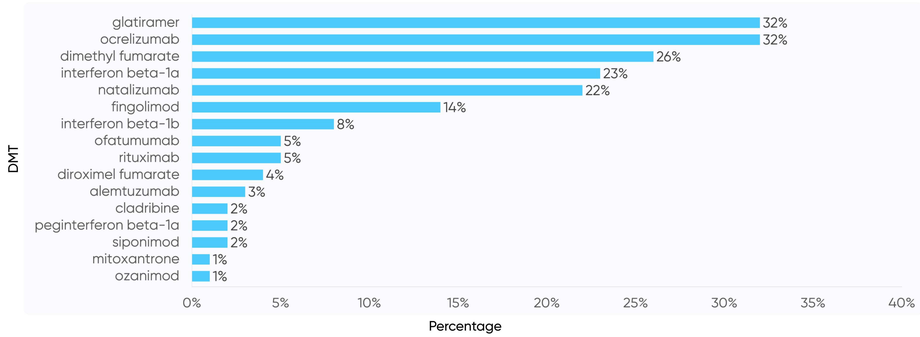

Figure 2: DMT^^ Use for PwMS (N=2,864)

^^DMTs with <1% use are not shown in the figure above: daclizumab, monomethyl fumarate, ponesimod, rituximab-abbs, rituximab-pvvr, teriflunomide

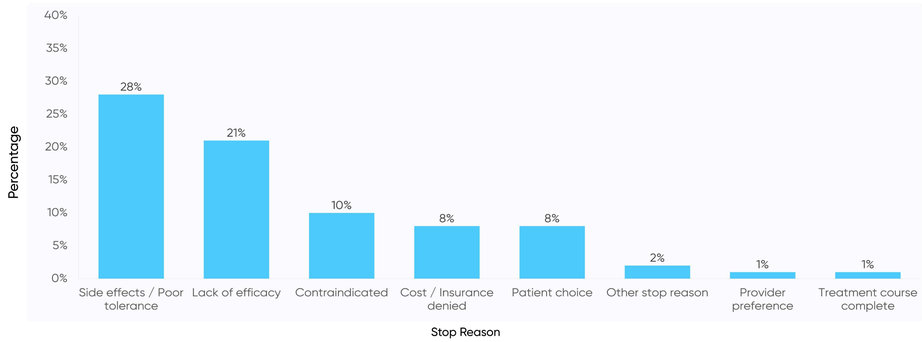

Figure 3: Reasons for DMT Discontinuation Among PwMS with ≥1 Reason for DMT Discontinuation (N=1,376)

Results

- There were 2,864 PwMS who met the inclusion criteria for this study with a median (Q1, Q3) observation time of 4 (2, 7) years
- PwMS were mostly female, white, and non-Hispanic/Latino (**Table 1**)
- Almost half of PwMS had documented cane or walker use and about a quarter had documented wheelchair or scooter use (**Table 1**)
- 16% of PwMS had ≥1 documented Expanded Disability Status Scale (EDSS) score
  - The most recent EDSS scores for these patients was bimodally distributed with modes at 2.0 and 6.0 (**Figure 1**)
- The ARR amongst the whole cohort was 0.46 and 59% of PwMS had ≥1 documented relapse
- All PwMS had ≥1 outpatient visit and more than half had ≥1 hospitalization (**Table 2**)
  - Most patients had ≥1 visit with a Neurologist and a Primary Care clinician and about a third of patients had ≥1 visit with a physical therapist
- Almost all PwMS had an MRI of the CNS (**Table 2**)
  - Of the 81% of patients with a MRI interpretation available, 27% of patients had ≥1 finding of radiologically active disease
- Most PwMS (86%) had a record of DMT treatment
  - The most common DMTs were glatiramer, ocrelizumab, dimethyl fumarate, and interferon beta-1a (**Figure 2**)
- Of patients with DMT treatment recorded, 56% had ≥1 reason for discontinuation documented
  - Among patients with reasons for discontinuation documented, patients most commonly discontinued due to side effects/poor tolerance, inefficacy, and contraindication (**Figure 3**)

Conclusion

- Most PwMS in this study had ≥1 hospitalization and the most common reason patients discontinued a DMT was side effects/poor tolerance
- Further research is needed to understand how to improve treatment for PwMS, while reducing disease progression and relapse-related HCRU

References

1. Pardo G, Pineda ED, Ng CD, Sheinson D, Bonine NG. The Association Between Persistence and Adherence to Disease-Modifying Therapies and Healthcare Resource Utilization and Costs in Patients With Multiple Sclerosis. J Health Econ Outcomes Res. 2022;9(1):111-116. Published 2022 Apr 26. doi:10.36469/jheor.2022.33288
2. McGinley MP, Goldschmidt CH, Rae-Grant AD. Diagnosis and Treatment of Multiple Sclerosis: A Review. JAMA. 2021;325(8):765–779. doi:10.1001/jama.2020.26858