Poster DMT39

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Change in Healthcare Resource Utilization Following Initiation of Ofatumumab in Patients With Multiple Sclerosis

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KEY FINDINGS & CONCLUSIONS

- In a real-world sample of patients with multiple sclerosis (MS), rates of MS-related hospitalization, days of hospitalization, and outpatient (OP) visits decreased significantly following the initiation of ofatumumab (OMB). Hospitalization and days of hospitalization decreased by 61% and 67%, respectively, whereas OP visits decreased by 30%
- Similar reductions were observed in a subset of patients without and with prior anti-CD20 exposure
- Taken together, these results highlight the benefits of OMB for patients, payers, and the health care system

INTRODUCTION

- Multiple sclerosis (MS) is a chronic, irreversible autoimmune disease of the central nervous system[1] that affects close to 1 million adults in the United States (US)[2]
- Currently, no curative treatment exists for MS. However, several disease-modifying therapies (DMTs) were shown to reduce relapse rates and slow disability worsening and disease progression[3,4]
- Ofatumumab (OMB), a US Food and Drug Administration (FDA)-approved CD20-directed monoclonal antibody, has shown efficacy in reducing relapse and slowing progression in MS
- Real-world (RW) data are needed to assess whether the clinical benefits of OMB translate into decreased health care resource utilization (HCRU)

OBJECTIVE

- To assess change in MS-related HCRU following OMB initiation in a RW sample of patients with MS using US administrative claims data

METHODS

Study Design

- A retrospective pre-post cohort study was conducted using the Optum® Clinformatics® Data Mart database (August 2019-May 2023; ***study period***), a longitudinal database of medical and pharmacy administrative claims for patients enrolled in commercial insurance and Medicare Advantage plans in the US
- ***Index date*** = the date of the first OMB claim, which was by design after FDA approval on August 20, 2020
- The ***OMB MS sample*** included adults (aged ≥18 years) with:
  - ≥1 MS diagnosis (International Classification of Diseases, 10th Revision, Clinical Modification: G35) in an inpatient (IP) or outpatient (OP) setting;
  - ≥1 OMB claim on or after August 20, 2020 (index date);
  - Continuous enrollment in a health care plan ≥12 months before and ≥6 months after the index date; and
  - Persistent use of OMB ≥6 months after the index date (ie, no gaps of ≥60 days or switch to another DMT)
- The ***anti–CD20-naïve*** and **anti–CD20-experienced** cohorts included a subset of the OMB MS sample without and with a claim for another anti-CD20 within the 12 months prior to the index date, respectively
- MS-related HCRU was measured in 2 periods:
  - ***Preindex period*** = fixed 12-month period prior to the index date
  - ***Postindex period*** = varying ≥6-month period from the index date until the end of enrollment/the study period

Measurements

- MS-related HCRU included:
  - Number of MS-related hospitalizations
  - Number of days of MS-related hospitalization
  - Number of MS-related emergency department (ED) visits
  - Number of MS-related OP visits
- To be designated as MS related, hospitalizations were required to have an MS diagnosis code (G35) in the primary position, whereas OP and ED visits could have an MS diagnosis in any position
- An HCRU cleaning algorithm sorted medical claims into distinct HCRU care episodes. Overlapping IP records were combined into hospitalization episodes. ED visits occurring on IP admission days were included separately to accommodate ED visits leading to hospitalization. Single-day IP stays were treated as OP visits, and OP visits on days of hospitalization or ED visits were discarded

Statistical Analyses

- Rates of MS-related HCRU per person-year (PPY) and their 95% CIs were obtained from intercept-only negative binomial (NB) models. Results are presented as rate PPY (95% CI; N events/N person-years)
- Incidence rate ratios (IRRs) comparing rates PPY in the pre and post periods were obtained from NB models with period (post- vs preindex) as a predictor variable, standard errors (SEs) adjusted for clustering by patient ID, and no covariate adjustment. Covariate adjustment was not applied in the analysis as patient-level confounders were controlled by the within-individual pre-post design

RESULTS

Preindex Patient Characteristics

- 625 patients met the inclusion criteria for the OMB MS sample
- 522 and 103 patients met additional inclusion criteria for the anti–CD20-naïve and anti–CD20-experiend subcohorts, respectively
- Among the patients in the OMB MS sample, mean (SD) age at the index date was 48 (11.4) years (**Table 1**). Age at the index date varied widely, ranging from 21 to 78 years. Most (75%) patients were female, 67% were White, and 34% were enrolled in a Medicare Advantage plan

Table 1. Preindex Patient Characteristics

	OMB MS sample (N=625)	Anti–CD20-naïve (N=522)	Anti–CD20-experienced (N=103)
Age, mean (SD), years	48.47 (11.42)	48.41 (11.40)	48.75 (11.57)
Female, n (%)	466 (74.56)	386 (73.95)	80 (77.67)
Payer type, n (%)			
Commercial	413 (66.08)	352 (67.43)	61 (59.22)
Medicare	211 (33.76)	169 (32.38)	42 (40.78)
Multiple	1 (0.16)	1 (0.19)	0 (0)
Year of index date			
2020	20 (3.20)	19 (3.64)	1 (0.97)
2021	311 (49.76)	258 (49.43)	53 (51.46)
2022	294 (47.04)	245 (46.93)	49 (47.57)
Race, n (%)			
White	419 (67.04)	357 (68.39)	62 (60.19)
Black or African American	90 (14.40)	75 (14.37)	15 (14.56)
Hispanic	68 (10.88)	51 (9.77)	17 (16.50)
Asian	10 (1.60)	8 (1.53)	2 (1.94)
Missing	38 (6.08)	31 (5.94)	7 (6.80)
Region, n (%)			
Midwest	152 (24.32)	128 (24.52)	24 (23.30)
Northeast	68 (10.88)	62 (11.88)	6 (5.83)
South	284 (45.44)	233 (44.64)	51 (49.51)
West	121 (19.36)	99 (18.97)	22 (21.36)
DCCI, mean (SD)	0.82 (1.48)	0.83 (1.50)	0.75 (1.37)
PDG, mean (SD)	1.07 (1.15)	1.06 (1.15)	1.12 (1.17)
Top 5 MS-related symptoms and secondary conditions, n (%)			
Fatigue or malaise	207 (33.12)	174 (33.33)	33 (32.04)
Anxiety	204 (32.64)	166 (31.80)	38 (36.89)
Sensory problems	158 (25.28)	146 (27.97)	12 (11.65)
Eye symptoms	117 (18.72)	103 (19.73)	14 (13.59)
Urinary tract infection	89 (14.24)	66 (12.64)	23 (22.33)
MS disability*, n (%)			
No EDSS-related symptoms	520 (83.20)	437 (83.72)	83 (80.58)
Mild	11 (1.76)	11 (2.11)	0 (0)
Moderate	35 (5.60)	27 (5.17)	8 (7.77)
Severe	59 (9.44)	47 (9.00)	12 (11.65)
Prior DMT, n (%)	397 (63.52)	294 (56.32)	103 (100.00)
Low-/moderate-efficacy therapy	260 (41.60)	255 (48.85)	5 (4.85)
High-efficacy therapy	146 (23.36)	43 (8.24)	103 (100.00)

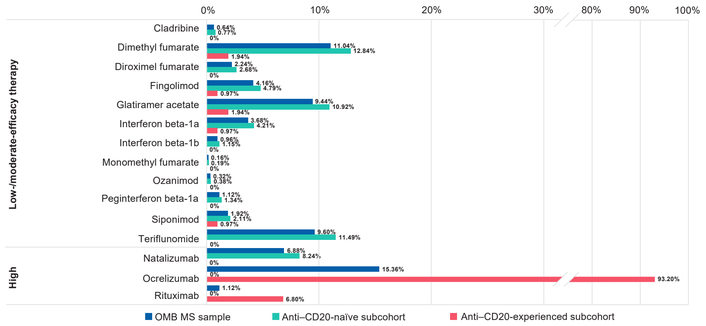
DCCI, Deyo-Charlson Comorbidity Index; DMT, disease-modifying therapy; EDSS, Expanded Disability Status Scale; MS, multiple sclerosis; OMB, ofatumumab; PDG, Psychiatric Diagnosis Group
MS disability is based on observance of EDSS-related symptoms and durable medical equipment use observed in claims data weighted by severity score. Using a published algorithm, disability levels and definitions are as follows: severe: defined as having ≥1 EDSS-related symptom with severity score = 3 in any functional system; moderate: defined as having ≥1 EDSS-related symptom with severity score = 2 in any functional system or having ≥2 functional systems with severity score = 1; mild: defined as having only 1 EDSS-related symptom with severity score = 1 or having no EDSS-related symptoms observed during the measurement period

- Included patients had relatively mild MS disability, with 85% of patients having no or mild Expanded Disability Status Scale–related symptoms. However, MS disability may be underestimated in claims data (see the Limitations section). The most common MS-related symptoms and secondary conditions were fatigue or malaise (33%), anxiety (33%), and sensory problems (25%). The mean Deyo-Charlson Comorbidity Index value of 0.8 indicates a relatively low level of comorbidity burden in the sample
- Demographic and clinical characteristics were in general similar between the OMB MS sample and anti–CD20-naïve and anti–CD20-experienced subcohorts

MS Treatment History

- In the overall OMB MS sample:
  - Approximately two-thirds (64%) of patients received another DMT in the preindex period; 42% and 23% of included patients received low- and high-efficacy DMTs, respectively (**Table 1**)
  - The most common DMT in the preindex period was ocrelizumab (15%), followed by dimethyl fumarate (11%) and teriflunomide (10%) (**Figure 1**)
- In the anti–CD20-naïve subcohort
  - A higher proportion (44% vs 36%) of patients were untreated in the preindex period (**Table 1**)
  - The most common DMTs received were dimethyl fumarate (13%), followed by teriflunomide (11%) and glatiramer acetate (11%) (**Figure 1**)
- In the anti–CD20-experienced subcohort, only 5% of patients received a low-efficacy therapy in addition to anti-CD20 in the preindex period, and no patients received a high-efficacy therapy other than an anti-CD20 (**Table 1**). 94% and 7% of patients received ocrelizumab and rituximab, respectively (**Figure 1**)

Figure 1. Summary of DMTs in the Preindex Period



DMT, disease-modifying therapy; MS, multiple sclerosis; OMB, ofatumumab

Limitations

- Analyses using claims data are dependent on the accuracy and specificity of entered diagnostic codes
- This study uses a pre-post design that adjusts for time-invariant factors, but not for time-variant factors such as disease progression, which may confound results
- The requirement of 6 months of persistent OMB use during the postindex period may introduce selection bias by removing patients who were intolerant or nonresponsive to OMB
- Estimates in the preindex period (ie, preindex HCRU) will capture the loss or lack of effectiveness associated with the preindex treatment that may have motivated the switch to OMB. In other words, poor or suboptimal preindex endpoints may be inherent to the study design
- Data are primarily from employer-sponsored plans and therefore underrepresent patients older than 65 years and those on Medicaid, potentially limiting the generalizability of these findings

Key Outcomes

MS-Related HCRU in the Pre- and Postindex Periods

- In the OMB MS sample, significant reductions were observed in the number of hospitalizations, days of hospitalization, and OP visits following the initiation of OMB (**Table 2**):
  - The number of hospitalizations PPY (95% CI) decreased significantly from 0.05 (0.03-0.07; 30/625) to 0.02 (0.01-0.03; 15/820) in the pre- vs postindex period (IRR=0.39; 95% CI: 0.20-0.75; p=0.005)
  - Days of hospitalization PPY decreased significantly from 0.44 (0.20-0.94; 272/625) to 0.14 (0.06-0.38; 100/820) in the pre- vs postindex period (IRR=0.33; 95% CI: 0.15-0.75; p=0.008)
  - OP visits PPY decreased significantly from 6.53 (6.16-6.93; 4084/625) to 4.58 (4.30-4.87; 3756/820) in the pre- vs postindex period (IRR=0.70; 95% CI: 0.65-0.76; p<0.001)
  - ED visits PPY decreased nonsignificantly from 0.16 (0.12-0.22) to 0.13 (0.09-0.19; IRR=0.82; p=0.276)
- Consistent patterns were observed in the anti–CD20-naïve and anti–CD20-experienced subcohorts

Table 2. MS-Related HCRU in the Pre- and Postindex Periods

	OMB MS sample (N=625)			Anti–CD20-naïve (N=522)			Anti–CD20-experienced (N=103)		
	Preindex period	Postindex period	p-Value[1]	Preindex period	Postindex period	p-Value[1]	Preindex period	Postindex period	p-Value[1]
Number of person-years	625	820	–	522	688	–	103	131	–
MS-related hospitalizations									
MS-related hospitalizations									
Number of events	30	15	–	24	15	–	6	0	–
Rate PPY (95% CI)	0.048 (0.031-0.074)	0.018 (0.011-0.032)	–	0.046 (0.029-0.073)	0.022 (0.013-0.038)	–	0.058 (0.018-0.184)	0 (0, 0)	–
IRR (95% CI)	0.388 (0.201-0.751)		0.005	0.482 (0.246-0.944)		0.033	0 (0-0)		<0.001
Days of MS-related hospitalization									
Number of events	272	100	–	236	100	–	36	0	–
Rate PPY (95% CI)	0.435 (0.201-0.943)	0.144 (0.055-0.375)	–	0.452 (0.193-1.060)	0.172 (0.066-0.448)	–	0.350 (0.252-0.485)	0 (0-0)	–
IRR (95% CI)	0.330 (0.146-0.746)		0.008	0.381 (0.166-0.872)		0.022	0 (0-0)		<0.001
MS-related ED visits									
Number of events	101	113	–	74	86	–	27	27	–
Rate PPY (95% CI)	0.162 (0.119-0.219)	0.132 (0.092-0.188)	–	0.142 (0.101-0.200)	0.115 (0.078-0.170)	–	0.262 (0.138-0.497)	0.221 (0.094-0.523)	–
IRR (95% CI)	0.817 (0.568-1.175)		0.276	0.817 (0.525-1.270)		0.368	0.840 (0.438-1.613)		0.601
MS-related outpatient visits									
Number of events	4084	3756	–	3305	3106	–	779	650	–
Rate PPY (95% CI)	6.534 (6.162-6.929)	4.575 (4.303-4.865)	–	6.331 (5.928-6.763)	4.503 (4.212-4.815)	–	7.563 (6.690-8.550)	4.946 (4.246-5.762)	–
IRR (95% CI)	0.700 (0.645-0.760)		<0.001	0.711 (0.648-0.781)		<0.001	0.654 (0.559-0.766)		<0.001

ED, emergency department; HCRU, health care resource utilization; IRR, incidence rate ratio; MS, multiple sclerosis; OMB, ofatumumab; PPY, per person-year

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