Comparative Effectiveness of Erenumab versus Oral Preventive Medications among Migraine Patients: A US Claims Database Study

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Introduction

- Migraine is a prevalent, debilitating neurological disease, with a high global burden.[1-4]
- Guidelines recommend the use of both acute and preventive therapy for the pharmacological management of migraine, with their use depending on the severity and frequency of attacks, as well as patient characteristics and preferences.[5]
- Aimovig® (erenumab-aooe) is a first-in-class calcitonin gene-related peptide receptor antagonist, approved in the US for the preventive treatment of migraine in adults.

Objective

- To compare the effectiveness of erenumab and OMPM on acute medication usage[a], HCRU, and a composite endpoint[b] among commercially insured patients with migraine in the US.

Methods

- A retrospective, treatment effectiveness, non-interventional, observational study using Optum's de-identified Clinformatics® Data Mart (CDM) Database.
- Acute medication usage assessments: the number of types of acute medication used at a specific class level (triptans, opioids, NSAIDs, ergots, and barbiturates) or at generic drug level, the number of claims per person for acute medication, and the proportion of patients using acute medication in the 6-month post-index period.

[a]Triptans, opioids, non-steroidal anti-inflammatory drugs [(NSAIDs)], ergots, and barbiturates). [b]The components of the composite endpoint is explained on the next slide. 1. Buse DC, et al. Mayo Clin Proc. 2009;84:422-435; 2. Martelletti P, et al. J Headache Pain. 2018;19:115; 3. Bonafede M, et al. Headache. 2018;58:700-714; 4. Diseases GBD, Lancet. 2020;396:1204-1222; 5. American Headache Society. Headache. 2019;59:1-18; 6. Ong JJY, et al. Neurotherapeutics. 2018;15:274-290; 7. Estemalik E, et al. Neuropsychiatr Dis Treat. 2013;9:709-720.
HCRU, healthcare resource utilization; OMPM, oral migraine preventive medication; US, United States.

Methods (Continued)

- HCRU assessments: the number of all-cause and migraine-specific ER/inpatient visits, office visits, neurologist or headache specialist visits, and other outpatient visits per person 6 months post treatment initiation of erenumab or OMPM was assessed[a].
- Composite endpoint assessments[b]: 1) outpatient visits with a diagnosis of migraine and an associated acute medication claim, 2) hospital admissions with a primary diagnosis for migraine, or 3) ER visits with a primary diagnosis for migraine.
- Erenumab and OMPM cohorts were matched 1:1 using the PS method with stratification. Sensitivity analysis was performed using the IPTW model with 1:3 randomized PS-matched data for erenumab and OMPM, respectively.
- The variables for PS matching included age, gender, Charlson Comorbidity Index, insurance type, region, selected comorbidities[c], CM without aura, acute/preventive drug use, and HCRU.

Results

- This was a retrospective non-interventional analysis
  - Adult migraine patients from the US initiating erenumab between May 1, 2018 and September 30, 2019 or OMPM between May 1, 2015 and April 30, 2018 identified from Optum's de-identified CDM Database
- Data for 4,679 erenumab and 75,861 OMPM patients assessed before matching
  - 2,343 matched patients from each cohort identified post stratified PS matching

Figure 1: Study design

[a] The proportion of patients with all-cause and migraine-specific visits to healthcare providers 6 months post treatment initiation of erenumab or OMPM was also evaluated.
[b] Any events that occurred ≤3 days apart were counted only once.
[c] Insomnia, depression, cardiovascular disease, irritable bowel syndrome, and fibromyalgia.
[d] Between 1 May 2018 and 30 September 2019.
[e] Between 1 May 2015 and 30 April 2018.

CDM, Clinformatics® Data Mart; CM, chronic migraine; CV, cardiovascular; ER, emergency room; HCP, healthcare practitioner; HCRU, healthcare resource utilization; IPTW, inverse probability of treatment weighting; OMPM, oral migraine preventive medication; PS, propensity score; SD, standard deviation; SMD, standardized mean difference; w/o, without.

Results (Continued)

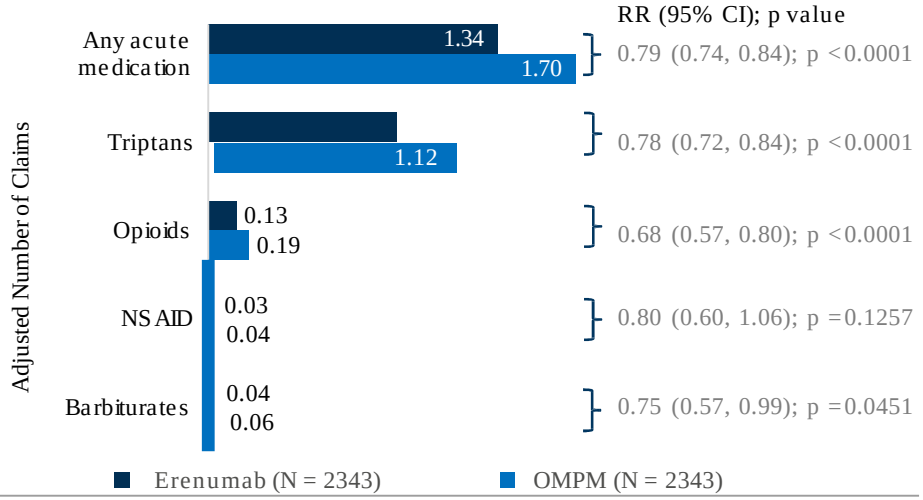
Table 1. Demographics and 12-month pre-index clinical characteristics

N (%)		Pre-matched			Post-matched (1:1)		
		Erenumab N = 4679	OMPM N = 75,861	SMD	Erenumab N = 2343	OMPM N = 2343	SMD
Age at index date, mean (SD)		50.2 (13.7)	50.2 (15.7)	0.00	49.7 (13.9)	49.2 (14.4)	0.03
Female		3959 (84.6)	61,856 (81.5)	0.08	2070 (88.4)	2070 (88.4)	0.00
CM w/o aura		2820 (60.3)	7875 (10.4)	1.22	935 (39.9)	935 (39.9)	0.00
Insurance type							
Point of service		2401 (51.3)	40,255 (53.1)	0.04	1291 (55.1)	1275 (54.4)	0.01
Other		989 (21.1)	15,625 (20.6)	0.01	447 (19.1)	414 (17.7)	0.04
Health maintenance organization		768 (16.4)	10,590 (14.0)	0.07	333 (14.2)	346 (14.8)	0.02
Exclusive provider organization		333 (7.1)	5610 (7.4)	0.01	188 (8.0)	206 (8.8)	0.03
Preferred provider organization		188 (4.0)	3781 (5.0)	0.05	84 (3.6)	102 (4.4)	0.04
Number of preventive drug class used in 12 months pre-index period							
0		1476 (31.6)	61,472 (81.0)	1.15	1211 (51.7)	1211 (51.7)	0.00
1		1619 (34.6)	9988 (13.2)	0.52	793 (33.9)	799 (34.1)	0.01
2		1034 (22.1)	3538 (4.7)	0.53	289 (12.3)	296 (12.6)	0.01
3+		550 (11.8)	863 (1.1)	0.44	50 (2.1)	37 (1.6)	0.04
Preventive drugs used in 12 months pre-index period							
Anticonvulsant		1885 (40.3)	7875 (10.4)	0.73	681 (29.1)	689 (29.4)	0.01
Antidepressant		1276 (27.3)	5024 (6.6)	0.57	412 (17.6)	434 (18.5)	0.02
OnabotulinumtoxinA		971 (20.8)	0	0.72	0	0	0.00
Beta blocker		846 (18.1)	3855 (5.1)	0.41	297 (12.7)	269 (11.5)	0.04
Calcium channel blocker		358 (7.7)	1683 (2.2)	0.25	115 (4.9)	79 (3.4)	0.08
Proportion of patients who used health care resources in 12 months pre-index period							
ER/inpatient visits	All-cause	1614 (34.5)	24,434 (32.2)	0.05	683 (29.2)	653 (27.9)	0.03
	Migraine-specific	318 (6.8)	2753 (3.6)	0.14	18 (0.77)	18 (0.77)	0.00
Office visits	All-cause	4534 (96.9)	70,595 (93.1)	0.18	2265 (96.7)	2251 (96.1)	0.03
	Migraine-specific	4250 (90.8)	43,814 (57.8)	0.82	2089 (89.2)	2089 (89.2)	0.00
Other outpatient visits	All-cause	4288 (91.6)	66,442 (87.6)	0.13	2101 (89.7)	2093 (89.3)	0.01
	Migraine-specific	1611 (34.4)	16,389 (21.6)	0.29	419 (17.9)	419 (17.9)	0.00
Neurologist/headache specialist visits	All-cause	3685 (78.8)	26,645 (35.1)	0.98	1721 (73.5)	1706 (72.8)	0.01
	Migraine-specific	3410 (72.9)	15,808 (20.8)	1.22	1559 (66.5)	1559 (66.5)	0.00

At 6-month post-index period, there was:

- Significantly lower use of acute medications (number and type of any acute medication, triptans and opioids) for erenumab users vs OMPM users (Figure 2)
- Significantly lower HCRUs for erenumab users vs OMPM users for most endpoints (Figure 3)

Figure 2: Adjusted mean number of claims[a,b]



[a]Use of non-migraine specific acute medications (NSAIDs, opioids, and barbiturates) required a migraine diagnosis on or before 7 days of the medication claim to proxy migraine-specific acute medication.
[b]Negative binomial model with PS-matched data with covariate adjustment.
CI, confidence interval; CM, chronic migraine; ER, emergency room; HCRU, healthcare resource utilization; NSAID, nonsteroidal anti-inflammatory drug; OMPM, oral migraine preventive medication; PS, propensity score; RR, rate ratio; SD, standard deviation; SMD, standardized mean difference; w/o, without.

Results (Continued)

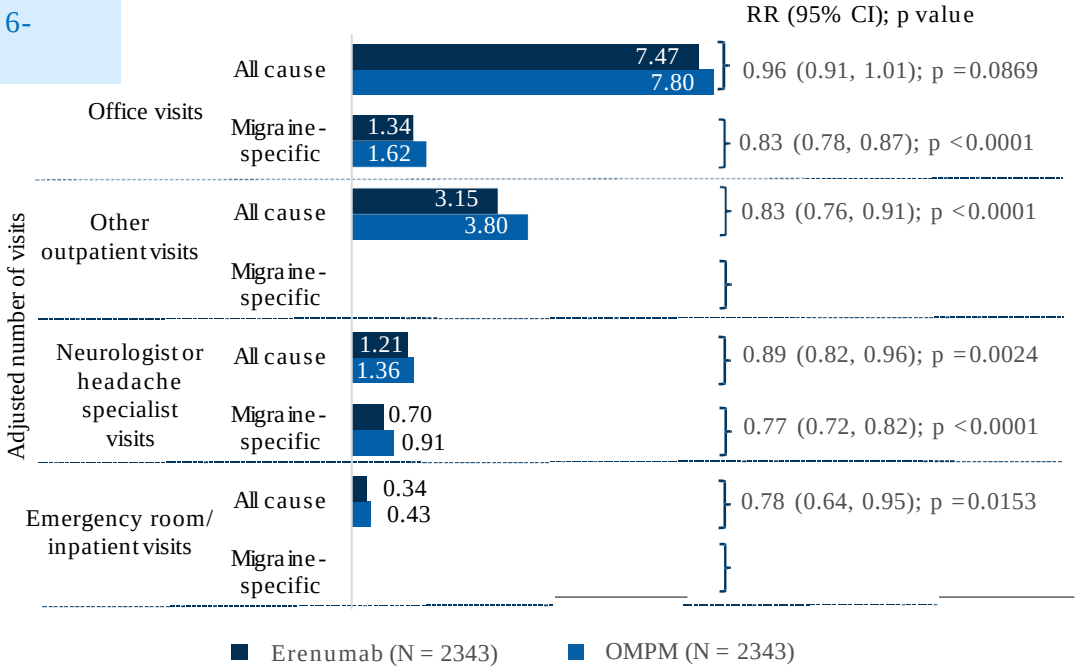
At 6-month post-index period:

- Significantly lower adjusted number of types of acute medications used (i.e. 0, 1, 2, 3+) for erenumab users vs OMPM users (Table 2)

Table 2. Number of type of acute medications used in the 6-month post-index period[a]

	Post-matched (1:1)		
N (%)	Erenumab N = 2343	OMPM N = 2343	OR (95% CI); p value
Number of generic drugs used			
0	963 (41.1)	764 (32.6)	0.69 (0.62, 0.78); p<0.0001
1	1091 (46.5)	1183 (50.5)	
2	221 (9.4)	298 (12.7)	
3+	68 (2.9)	97 (4.2)	
Number of drug classes used			
0	961 (41.0)	770 (32.8)	0.70 (0.63, 0.79); p<0.0001
1	1181 (50.4)	1297 (55.4)	
2	171 (7.3)	234 (10.0)	
3+	30 (1.3)	42 (1.8)	

Figure 3: Adjusted mean number of visits[b]

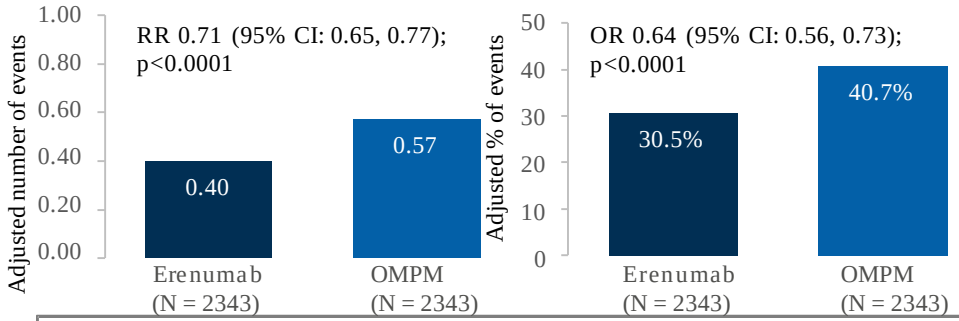


[a]A proportional odds model with PS-matched data with covariate adjustment was performed to assess the odds of having a higher number of different types of acute medication for both cohorts.
[b]Negative binomial model with PS-matched data with covariate adjustment.
CI, confidence interval; OMPM, oral migraine preventive medication; OR, odds ratio; RR, rate ratio.

Composite Endpoint

- Significantly lower mean number of events observed for the erenumab cohort than for the oral migraine preventive medication cohort (29% reduction).
- Significantly lower proportion of patients with any of the three events observed for erenumab vs oral migraine preventive medication (36% reduction).

Figure 4: Composite endpoint events



Conclusions

- Erenumab as a migraine prevention significantly reduces acute medication use (triptans and opioids, and any acute medication) and HCRU among migraine patients in a real-world setting, hence significantly reducing the burden of the disease.
- The magnitude of reductions was higher in erenumab than in patients treated with oral migraine preventive medications, showing that erenumab may be more effective as a migraine-preventative treatment in this population and time period.

Disclosures

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