EE256

Comparative Cost-Utility Analysis of Galcanezumab and Fremanezumab for Migraine Prevention in Individuals with Chronic Migraine who have Tried 2 to 4 Prior Preventive Treatments

Shiven Bhardwaj[1]; Marita Zimmermann[1,2]; Louis P. Garrison, Jr.[1]

1. The Comparative Health Outcomes, Policy and Economics Institute, School of Pharmacy, University of Washington, Seattle, WA, USA; 2. Institute for Disease Modelling, Bill and Melinda Gates Foundation, Seattle, WA, USA

THE CHOICE INSTITUTE
School of Pharmacy

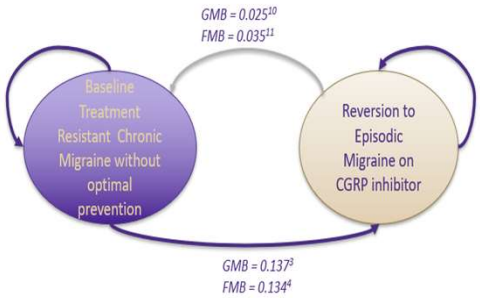
Background

- Migraine is a neurological condition that can result in considerable functional disability.[1]
- Individuals with higher migraine disease burden are candidates for preventive therapy.[2]
- Galcanezumab (GMB) and fremanezumab (FMB) are Calcitonin Gene-Relate Peptide antagonists (aCGRP) indicated for migraine prevention in patients with episodic (EM) and chronic migraine (CM).
- The cost-effectiveness of these two agents is unknown in patients with chronic migraine who have tried multiple preventive therapies, especially when the desired endpoint is "reversion to episodic migraine ".

Objective

This analysis attempts to assess the cost effectiveness of GMB compared to placebo for migraine prevention in individuals with CM who have tried 2 to 4 prior preventive therapies. FMB is also compared to GMB for cost-effectiveness.

Figure 1. Two health state model



Methods

- A Markov model (Fig. 1) was used to conduct a cost-utility analysis (CUA) in adults with treatment experienced CM, where GMB was compared to placebo (PBO) and FMB was compared to GMB. Projections were based on Phase 3b clinical trial outcomes.[3,4]
- A U.S. health care perspective was used. Model time horizon was 2 years with monthly cycles.
- A 3% discount per cycle was used for both costs and QALYs.
- For GMB v. PBO comparison, cost inputs included wholesale acquisition costs (WAC) for the aCGRP agents ($477/month for galcanezumab and $485/month for fremanezumab, each with 27% estimated rebates)[5], acute medication costs and ED use cost. Acute medication use and ED use estimates were obtained from GMB trial[6] and respective costs were based on studies based on claims data.[7,8] FMB vs. GMB analysis, only WAC were compared.
- Utility values for CM and EM were based on estimations from large observation studies.[9]
- Primary outcome was incremental cost-effectiveness ratio (ICER) in terms of the incremental cost change per quality-adjusted life year gained.
- One-way sensitivity analysis was conducted with varying estimates in costs, utility values and transition probabilities.

Table 1. Input parameters for Cost Utility Analysis.

Description	GMB	FMB	PBO	Source
Costs				
Product Cost, WAC-27%	$476.54 (1st cycle LD)	$485.45	N/A	5
Acute Medication Costs	$816.97	N/A	$834.02	6,7
ED Visit Costs	$3.67	N/A	$10.39	6,8
Transition Probabilities				
Discontinuation	0.0043	0.010	0.0043	4,10
CM to EM Reversion	0.137	0.134	0.043	4,10
Utility Weights				
Utility weights in HS1		0.449		9
Utility weights in HS2		0.689		9

Abbreviations: ED = Emergency Department, WAC = Wholesale Acquisition Cost, CM = chronic migraine, EM = episodic migraine, GMB = galcanezumab, FMB = fremanezumab, PBO = placebo, HS1 = Health State 1, HS2 = Health State 2.

Results

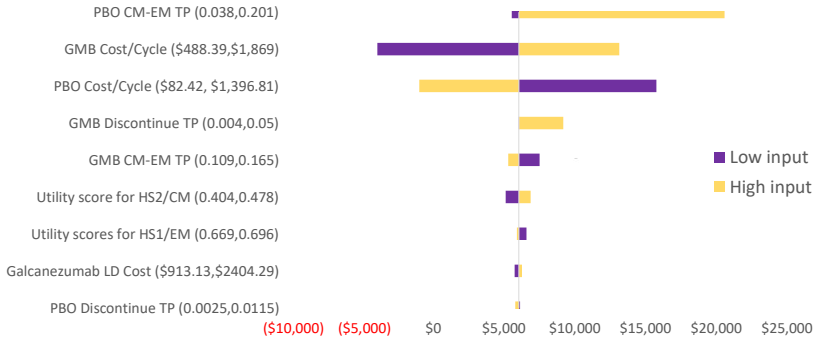
- In GMB vs PBO analysis, the total discounted costs for PBO were $15,144.98 and for GMB $23,503.96. Total QALYs were 9.53 and 10.94 for PBO and GMB, respectively. ICER was $5,937. For WTP threshold of $100,000 per QALY, the NMB is expected to be $134,863 (Table 2).
- In FMB vs GMB analysis, the total discounted costs for FMB were $8,706.81 and for GMB $8,785.35. Total QALYs were 10.84 for FMB and 10.94 for GMB. ICER was $748.85.
- In one way sensitivity analysis, the results were most sensitive to the costs of GMB and FMB and the probability of CM-EM reversion (Figure 2).

Table 2. Total and Incremental Costs

	Costs	QALYs
GMB vs. PBO		
Placebo	$15,144.98	9.53
Galcanezumab	$23,503.96	10.94
Incremental Values	$8,358.98	1.408
FMB vs. GMB		
Galcanezumab	$8,785.35	10.94
Fremanezumab	$8,706.81	10.84
Incremental Values	-$78.54	-0.104

Costs and QALY values for placebo, galcanezumab and fremanezumab reflect total values from a 2-year time horizon and 3% discounting per 1-month cycle on both cost and QALY. MMD = Monthly Migraine Days, CM = Chronic Migraine, EM = Episodic Migraine, GMB = galcanezumab, FMB = fremanezumab, PBO = placebo

Figure 2. Tornado Diagram for a one-way Sensitivity Analysis



Conclusion

In adults with chronic migraine who have tried 2 to 4 prior preventive therapies, both galcanezumab and fremanezumab are projected to be cost-effective.

References

1. Steiner, et al. J Headache Pain. 2020 Dec 2;21(1):137
2. Ailani, et al. Headache. 2021 Jul;61(7):1021-1039
3. Day, et al. Cephalalgia. 2020 Oct;40(1_suppl):75
4. Ashina, et al. J Neurol Sci. 2019 Oct;405:45–6
5. IBM Micromedex RED BOOK [Internet]
6. 6. Ambrosini, et al. J Manag Care Spec Pharm. 2022 Jun;28(6):645–56
7. Nguyen, et al. J Headache Pain. 2022 Aug 28;23(1):111.
8. Newman, et al. Neurol Clin Pract. 2021 Jun;11(3):206–15.
9. Gillard, et al. Value Health. 2012 May;15(3):485–94
10. Mulleners, et al. Lancet Neurol. 2020 Oct;19(10):814–25.
11.Ferrari, et al. Lancet. 2019 Sep 21;394(10203):1030–40.