Economic Evaluation of Atogepant versus Placebo for the Preventive Treatment of Episodic Migraine in Taiwan

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Background and Aims

- Migraine affects approximately 14% of the global population, particular in women and young adults, and is the second leading cause of disability worldwide, significantly reducing work productivity and quality of life.
- Atogepant, an oral CGRP receptor antagonist, has shown superior efficacy and safety compared to traditional agents; however, its higher cost and the limited availability of economic evaluations warrant further investigation.
- The study aims to assessed the cost-effectiveness of atogepant versus placebo for the prevention of episodic migraine in adults, from the perspective of Taiwan's National Health Insurance .

Methods

Model Structure and Data

- A Markov model (Figure 1) with a 12-week cycle and 1-year time horizon was developed in TreeAge Pro to assess the cost-effectiveness of atogepant versus placebo. Health states included: on treatment before assessment, on-treatment (responders), and off treatment, further stratified by monthly migraine days (MMDs).
- Atogepant costs were based on the NICE appraisal, while other costs were sourced from Taiwanese data. Transition probabilities were derived from the Phase III ADVANCE trial, and utility values from a UK HTA report on migraine prevention.
- One-way sensitivity analysis adjusted costs by ±20% and utilities by ±10%, respectively. Probabilistic sensitivity analysis used Monte Carlo simulation (5,000 iterations) to generate cost-effectiveness acceptability curves. The willingness-to-pay threshold was set at $34,040 per QALY gained (one GDP per capita).

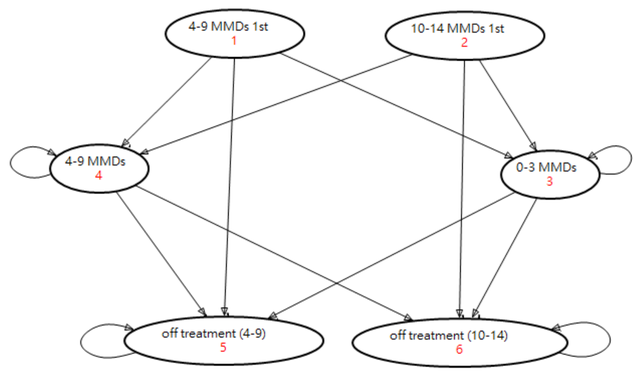

Figure 1. *Markov model*

Results

Base Case Analysis

- Over a 1-year time horizon, the atogepant group experienced more than a reduction of 24 migraine days per year compared to the placebo group, with an additional cost of $1729 and a QALY gain of 0.027. The ICER was $64,450 per QALY.

Table 1. *Costs, effectiveness, and incremental cost-effectiveness ratios of atogepant versus placebo.*

Strategy	Cost ($)	Incr. Cost ($)	Effect (QALYs)	Incr. Effect (QALYs)	ICER ($)
Atogepant	3051	1729	0.701	0.027	64,450
Placebo	1322	-	0.674	-	-

One-way sensitivity analysis

- Utility values was identified to be the most influential parameter in this model, particularly for the utility value assigned to the 0–3 MMD health state. A 10% increase (to 0.8330) in this utility value increased the ICER to $243,182, while a 10% decrease (to 0.6816) reduced the ICER to $38,110.

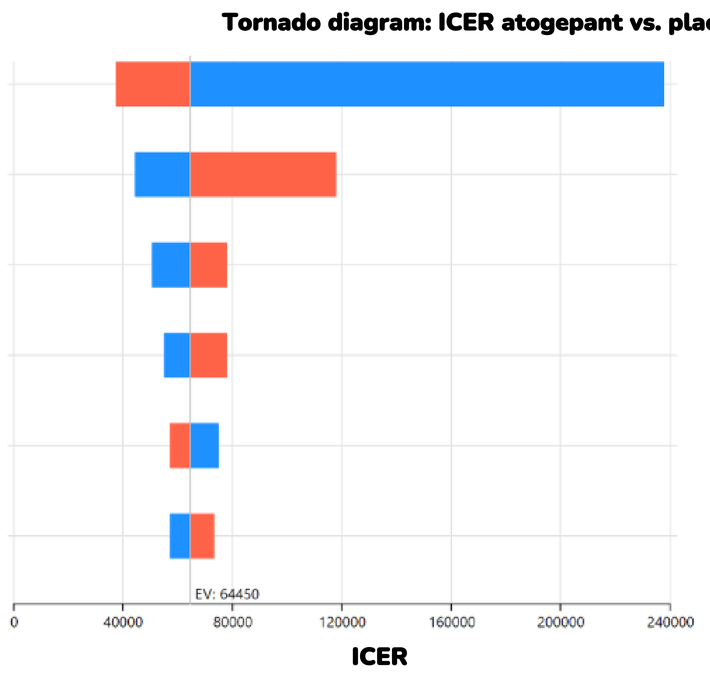

Figure 2. *One-way sensitivity analysis tornado diagram comparing atogepant and placebo*

Probabilistic Sensitivity Analysis

- To assess uncertainty, we conducted 5,000 Monte Carlo simulations, shown in the probabilistic sensitivity analysis in Figure 3. The diagonal line represents a willingness-to-pay threshold of $34,040 per QALY, indicating that atogepant is cost-effective in 33.54% of scenarios at this threshold.

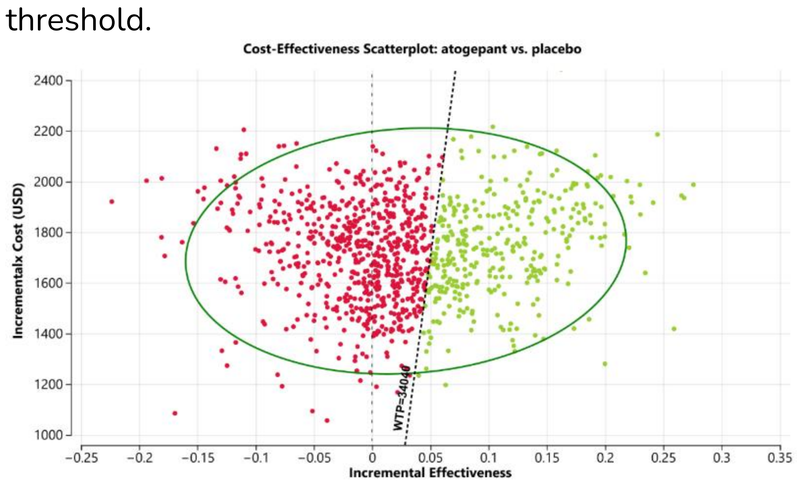

Figure 3. *Scatter plot of cost-effectiveness results using atogepant versus placebo*

Cost-Effectiveness Acceptability Curves (CEAC)

- Varying thresholds lead to different cost-effectiveness levels, as illustrated in the cost-effectiveness acceptability curves in Figure 4. When the willingness to pay reaches around $80,000 per QALY, the acceptability curve exceeds 50%. The CEAC indicated that atogepant becomes more likely to be cost-effective for the prevention of episodic migraine when the WTP exceeds $80,000. However, even as the WTP continues to increase, the probability of atogepant shows minimal increase at approximately 60%.

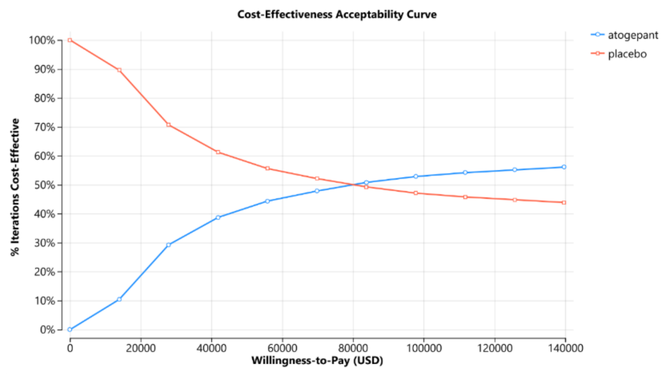

Figure 4. *Cost-effectiveness acceptability curves for atogepant versus placebo*

Conclusions

- This is the first study to use local real-world data to assess the cost-effectiveness of atogepant for episodic migraine prevention in Taiwan, providing evidence to support healthcare policy and clinical decisions.
- The results suggest that atogepant can effectively reduce the frequency of migraine attacks, improve patient quality of life, and meet reasonably accepted WTP thresholds.
- However, uncertainty in utility estimates highlights the need for further research to strengthen the robustness of these findings.

Reference:

1. Stovner, L.J., et al., The global prevalence of headache: an update, with analysis of the influences of methodological factors on prevalence estimates. The Journal of Headache and Pain, 2022. 23(1): p. 34.
2. Lipton, R.B., et al., Rates of Response to Atogepant for Migraine Prophylaxis Among Adults: A Secondary Analysis of a Randomized Clinical Trial. JAMA Network Open, 2022. 5(6): p. e2215499-e2215499.

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