Cost-Utility Analysis of Migraine Prevention Treatments for Chronic Migraine Headaches in the United States

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INTRODUCTION

Migraine is a disabling neurological disease characterized by headaches with throbbing sensation. Chronic migraine is defined as more than 14 migraine days per month.[1]

Migraine is one of the most prevalent neurological disorder in US.[2] It is also the second largest cause of disability worldwide following low back pain.[3] Total medical expenditures of patients with a diagnosis of migraine per year were $2,571 higher compared to patients who had no migraine.[4]

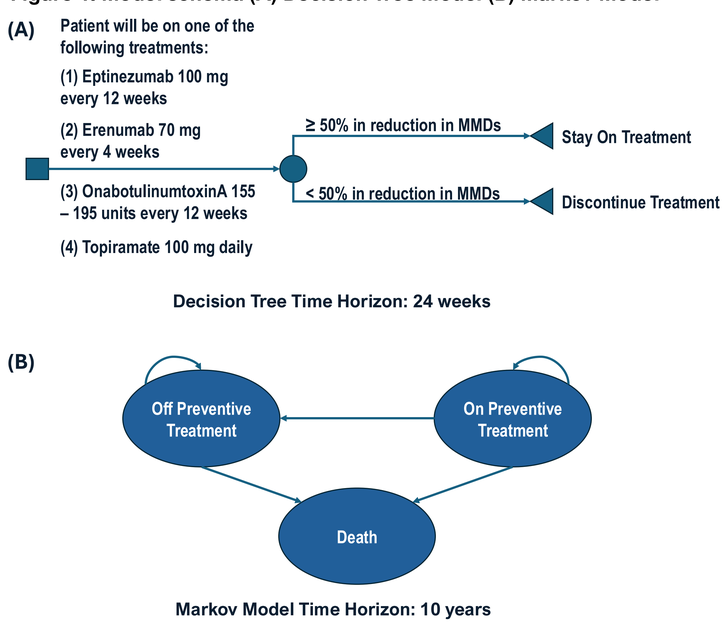
Conventional preventive treatments for chronic migraine include topiramate and onabotulinumtoxinA.

Calcitonin Gene-Related Peptide (CGRP) receptor monoclonal antibodies (mAbs), eptinezumab and erenumab, were approved by FDA in 2020 and 2018, respectively.

OBJECTIVE

To investigate the cost-effectiveness of chronic migraine prevention treatments (onabotulinumtoxinA, eptinezumab, and erenumab) compared to topiramate for prevention of chronic migraine from the US healthcare payer perspective

Figure 1. Model schema (A) Decision Tree Model (B) Markov Model



Main Findings

Topiramate, onabotulinumtoxinA, and eptinezumab were on the cost-effectiveness frontier.

Eptinezumab was a cost-effective strategy at a WTP threshold that is greater than $20,000 per QALY gained.

Policymakers can adapt topiramate, onabotulinumtoxinA, or eptinezumab based on the WTP threshold and needs of the health plan.

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METHODS

A cost-utility analysis was conducted to evaluate the cost-effectiveness of chronic migraine prevention treatments from the US healthcare payer perspective over a 10-year horizon.

Simulated patient cohort was US adults with episodic migraine for more than 12 months. Pharmaceutical costs were based on the US Veteran Affairs (VA) Federal Supply Schedule (FSS) pricing. Utility is calculated based on Monthly Migraine Days (MMDs) and estimations of a published regression model.[5]

DISCUSSION

Erenumab was eliminated since it was dominated by eptinezumab.

OnabotulinumtoxinA and eptinezumab had an ICER of $14,685 and $21,743 compared to topiramate, respectively.

Utility on treatment had the greatest impact on the INMB of onabotulinumtoxinA and eptinezumab.

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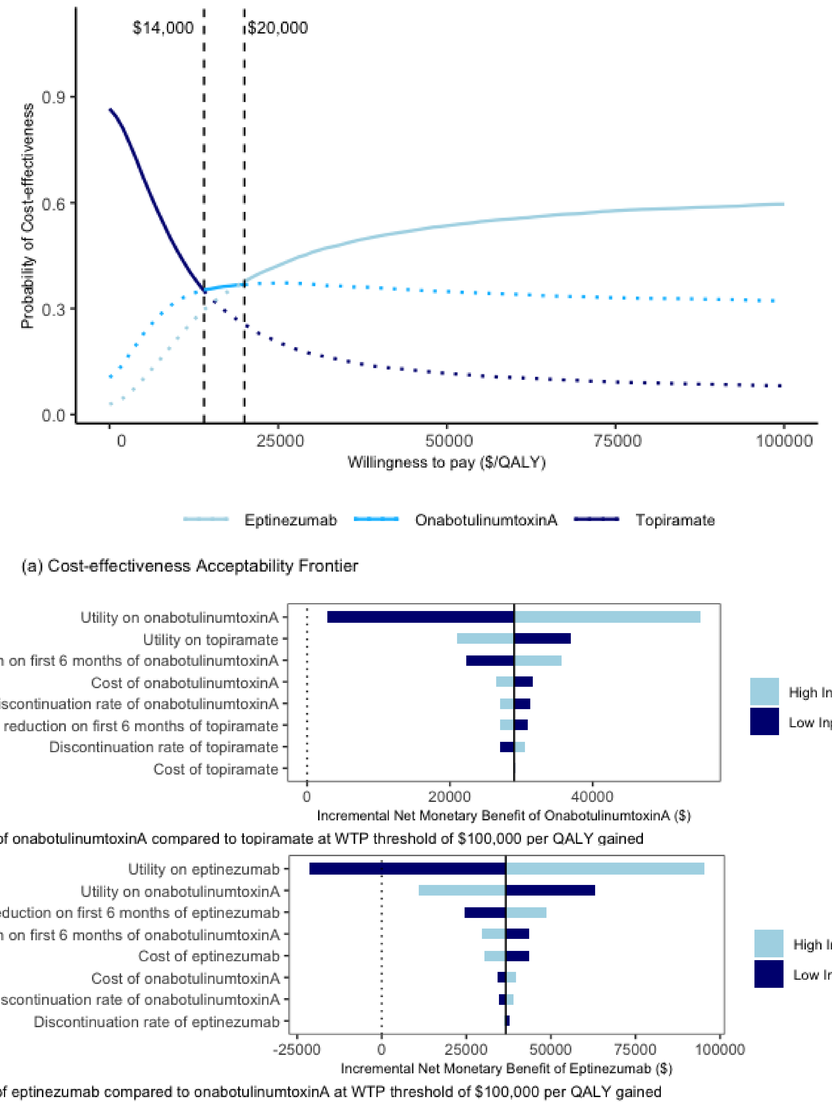
RESULTS

Table 1. Deterministic Base-case Results

Strategy	Total Costs	Drug Costs	Total QALYs	Incremental Costs	Incremental QALYs	ICER
Topiramate	$98,201	$214	4.01	NA	NA	NA
OnabotulinumtoxinA	$103,192	$19,237	4.35	$4,991	0.34	$14,685
Eptinezumab	$116,526	$50,611	4.85	$13,334	0.5	$26,668
Erenumab	$125,822	$55,005	4.59	$9,296	-0.24	-$38,733

Figure 2. Sensitivity Analysis Results



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This work was supported by the UC San Diego Skaggs School of Pharmacy and Pharmaceutical Sciences Summer Research Program and American Foundation for Pharmaceutical Education (AFPE) Gateway to Research Awards