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Integrative review: MABS x Topiramate as a prophylactic treatment of migraine

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Introduction

Migraine is associated with central sensitization, a process involving increased excitability of neuronal membranes and decreased inhibitory influences, resulting in the chronicization of migraine pain. In this context, the pharmacodynamics of most preventive drugs involve suppressing pain signal transmission in central sensitization, thereby preventing chronic pain and its consequences. They are indicated for patients with frequent disabling migraine attacks or medication-refractory attacks. Monoclonal antibodies against calcitonin gene-related peptide (CGRP antagonists) innovate by blocking CGRP through crosstalk via trigeminal peripheral neuron blockade. Topiramate, an anticonvulsant, reduces neuronal excitability through modulation of ion channels and suppression of trigeminal neuron activation and excitatory neurotransmission.

Objective

To evaluate the efficacy and mechanism of action of each anti-CGRP mAb in the preventive treatment of migraine, through comparisons with the action of Topiramate, using an integrative review.

Methods

Electronic searches were conducted in the MEDLINE (PubMed) and LILACS databases using the descriptors "Calcitonin Gene-Related Peptide Receptor Antagonists" and "migraine", were included clinical trials, controlled and randomized trials, and meta-analyses related to studies in adults, with full-text available for free, published between 2020 and 2024, addressing MABS.

Results

Erenumab is a CGRP receptor antagonist, while Fremanezumab, Eptinezumab, and Galcanezumab antagonize the CGRP peptide. All showed early response in studies, with 12-week treatment, presentating consistent efficacy in treatment-naive and refractory patients. Their monthly subcutaneous administration, except for Eptinezumab, intravenous, favors adherence and pharmacodynamics, without the need for adjustments for hepatic/nephropathies. Erenumab outperformed Topiramate in efficacy, onset of results and fewer side effects. Fremanezumab had the highest overall response rate, Galcanezumab and Fremanezumab were superior in reducing days with symptoms in episodic migraine. In chronic migraine, Fremanezumab had less impact, while Erenumab and Eptinezumab were more effective. Eptinezumab showed better safety and Galcanezumab had more side effects. The price of antibodies far exceeds that of Topiramate, with higher costs for Erenumab and Eptinezumab.

Conclusion

The mechanism of action of mAbs holds great potential in the future of migraine prophylactic treatment, presenting high importance in refractory cases. However, their conditions hinder widespread prophylactic distribution; high cost and low dissemination still restrict benefits to patients with contraindications, side effects, and refractory cases to oral prophylactic treatment. Thus, one way to increase population access to mAbs is through government investment to make this medication available through SUS (Brazil's Unified Health System), thereby enhancing the therapeutic efficacy for headaches.