УДК [61+615.1] (06)
ББК 5+52.81
А 43
ISBN 978-985-21-1865-1

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ЭФФЕКТИВНОСТЬ РАЗЛИЧНЫХ ЛЕКАРСТВ ОТ МИГРЕНИ

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EFFECTIVENESS OF VARIOUS MEDICATIONS FOR MIGRAINE

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Резюме. В данной диссертации оценивается эффективность лекарств от мигрени, определяются противопоказания и изучаются стратегии по уменьшению или устранению неблагоприятных побочных эффектов у пациентов.

Ключевые слова: мигрень, суматриптан, cgrp, уброгепант, вазоконстрикция.

Resume. This thesis evaluates migraine medication effectiveness, identifies contraindications, and explores strategies to reduce or eliminate adverse side effects in patients.

Keywords: migraine, sumatriptan, cgrp, ubrogepant, vasoconstriction.

Relevance. Migraine is a chronic and debilitating neurological disorder that affects approximately one in seven adults globally, with women being disproportionately affected compared to men. This condition is characterized by intense, pulsating headaches that often localize to one side of the head. These headaches are frequently accompanied by other symptoms such as nausea, vomiting, and heightened sensitivity to sensory stimuli like light (photophobia) and sound (phonophobia). The severity and frequency of migraine attacks can significantly impair a person's quality of life, limiting daily activities and productivity.

The pathophysiology of migraine is complex and not yet fully understood, but it is believed to result from a multifaceted interaction between genetic predispositions and environmental triggers. Central to migraine development is the activation of the trigeminal nerve, which serves as a major pain pathway in the head and face. This activation leads to the release of various neuropeptides, particularly calcitonin gene-related peptide (CGRP), which causes inflammation and dilation of blood vessels in the meninges, contributing to the pain and other symptoms experienced during an attack.

Treatment strategies for migraine focus on both acute symptom relief and long-term prevention. Acute treatment typically involves pain relievers such as nonsteroidal anti-inflammatory drugs (NSAIDs) and triptans, which are serotonin receptor agonists that constrict blood vessels and inhibit the release of inflammatory neuropeptides. Preventive treatments include beta-blockers, anticonvulsants, and more recently, monoclonal antibodies targeting CGRP or its receptor, which have shown promise in reducing attack frequency and severity.

Side effects vary across medications, ranging from mild gastrointestinal discomfort to more serious cardiovascular concerns, particularly with vasoconstrictive agents like triptans. The ongoing research into CGRP's role has opened new avenues for targeted therapies, offering hope for improved management of migraine, especially for patients who

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do not respond well to traditional treatments. Understanding the interplay of genetic, neurological, and environmental factors remains essential for developing more effective and personalized migraine therapies.

Aim: this thesis aims to analyse patient responses to various migraine medications, assessing their efficacy and contraindications. Crucially, it will also investigate and propose solutions to mitigate or eliminate the adverse effects these medications can have on patients.

Objectives:

1. Analyse patient-reported outcomes and user reviews of various migraine medications from the Drugs.com platform.
2. Assess the overall effectiveness of migraine treatments regardless of specific brand names.
3. Explore broader patient experiences with non-pharmaceutical migraine therapies documented on the platform.

Material and methods. This study analyses patient-reported outcomes for various migraine medications, drawing on data from the open-source platform Drugs.com. It examines user reviews and experiences, focusing on the effectiveness of these treatments irrespective of specific brands. The analysis will also encompass broader patient outcomes associated with non-pharmaceutical migraine therapies, as documented on the platform. This exploration considers the diverse responses individuals experience with different treatment modalities, providing a comprehensive overview of patient perspectives on managing migraine through both medicinal and alternative approaches

Results and their discussion. The Migraine is a complex neurological disorder with a multifaceted underlying mechanism. The process begins with cortical spreading depression, a wave of neuronal and glial depolarization, which activates the trigeminal nerve–a key pain pathway in migraines. This activation triggers the release of calcitonin gene-related peptide (CGRP), a vasoactive neuropeptide that plays a crucial role in migraine pathophysiology. The release of CGRP leads to inflammation of the meninges, dilation of blood vessels, and increased sensitivity of central pain pathways, ultimately causing the characteristic throbbing headache and associated symptoms such as nausea and light sensitivity.

Sumatriptan, a widely prescribed medication for migraine management, functions as a 5-HT1B/1D receptor agonist. It alleviates migraine symptoms by constricting intracranial blood vessels and inhibiting the release of neuropeptides like CGRP. Based on 452 patient reviews, sumatriptan received an average rating of 7.6 out of 10, with 69% of users reporting positive therapeutic responses. However, 17% of patients experienced unfavorable outcomes. Some adverse effects linked to sumatriptan include exacerbated pain, progression from migraine aura to a full attack, and severe chest pain likely caused by vasoconstriction. This vasoconstriction is thought to result from CGRP inhibition mediated through serotonin-like activity. Additionally, serotonergic effects can impact the gastrointestinal system, cause nausea and potentially leading to ulceration.

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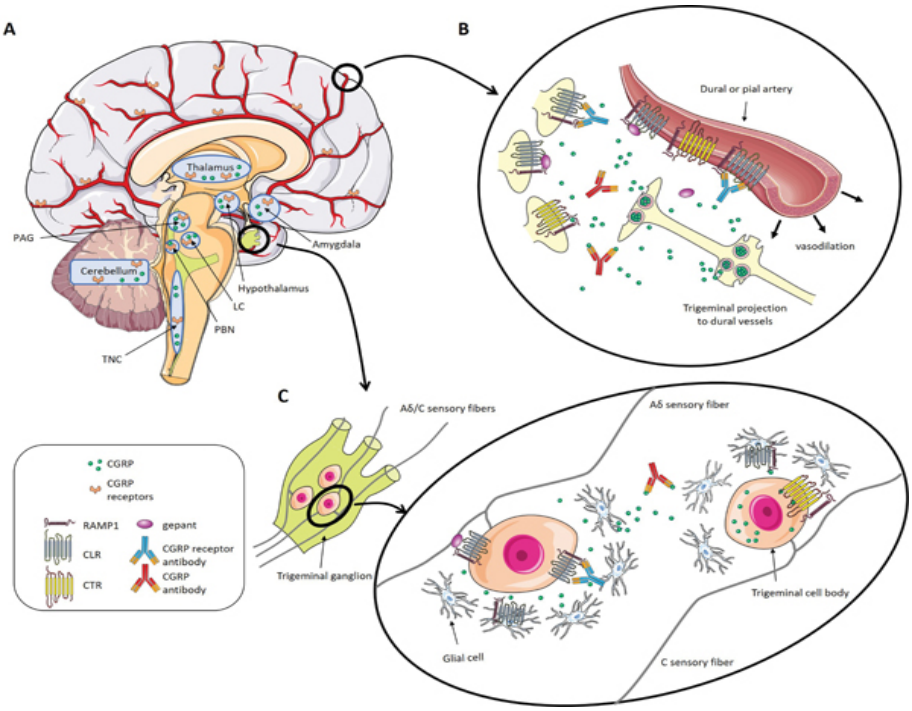
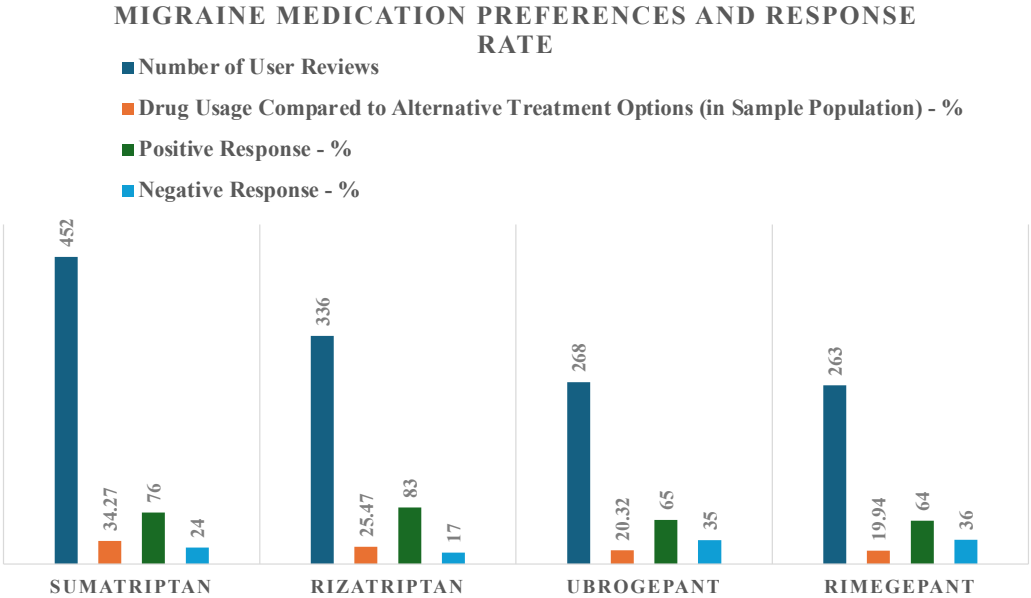


Fig. 1 – CGRP and CGRP receptor distribution in the peripheral and central nervous systems

The timing of sumatriptan administration plays a critical role in its effectiveness and tolerability. Patients experiencing migraines with unclear origins and intense pain reported that delayed administration of triptans–beyond the initial seconds or minutes–often correlated with prolonged and worsened pain. This suggests that initiating treatment during the prodromal phase, before full symptom onset, may yield better outcomes.



Graph. 1 – Analysis of User Responses to different Migraine Medications

For patients unresponsive to triptans, Botox, or CGRP inhibitors, Ubrogepant has emerged as an effective alternative. Among 252 patient responses, Ubrogepant received 59% positive reviews, positioning it as one of the highest-rated migraine drugs compared to

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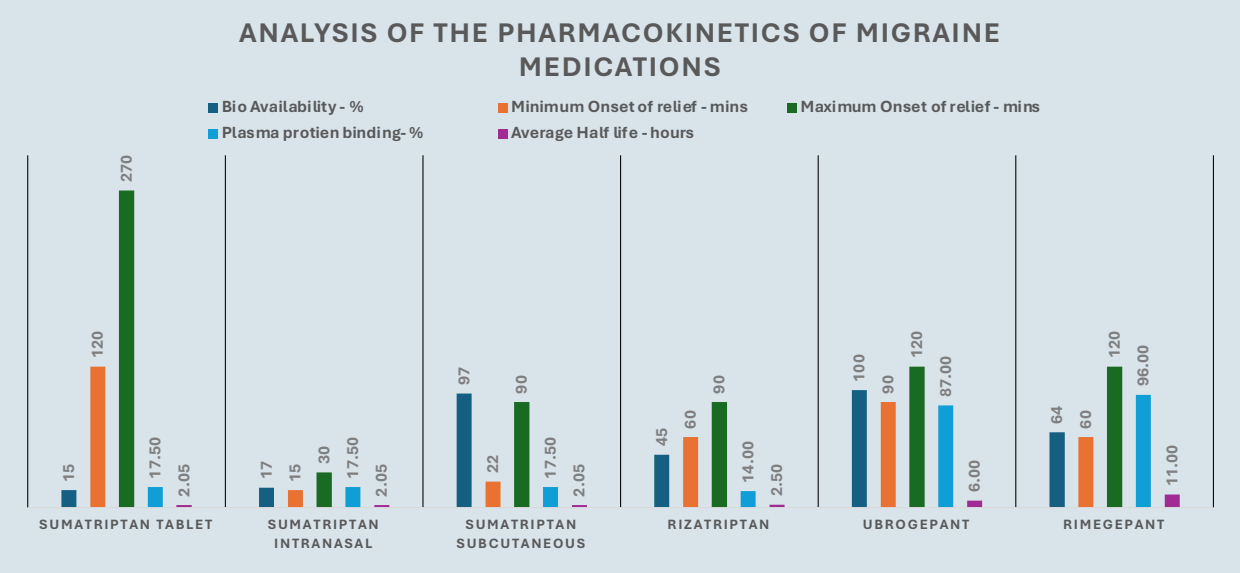
Botox and triptans. However, some patients reported inefficacy and symptom exacerbation with repeated use, indicating that while Ubrogepant offers promise, it may not be universally effective for all migraine sufferers.



Graph. 2 – Analysis of Pharmacokinetics of different Migraine Medications

Conclusion. Migraine, driven by complex mechanisms, finds relief in sumatriptan for many, though adverse effects and timing are crucial. Ubrogepant offers an alternative for those unresponsive to other treatments, but its efficacy also varies. Every drug depends on the conditions of the patients and parallel correlations with disbalance in the internal environment.

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