e-ISSN: 0975-1556, p-ISSN:2820-2643
Available online on www.ijpcr.com
International Journal of Pharmaceutical and Clinical Research 2024; 16(2); 1035-1038

Original Research Article

Comparison of Propranolol and Topiramate for the Prevention of Chronic Migraine

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Received: 25-12-2023 / Revised: 23-01-2024 / Accepted: 15-02-2024
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Conflict of interest: Nil

Abstract:

Background: A migraine is a type of headache characterised by severe pain, often accompanied by other symptoms such as nausea, vomiting, sensitivity to light, and sensitivity to sound. The present study was conducted to compare propranolol and topiramate for the prevention of chronic migraine.

Materials and Methods: 64 patients with migraine of both genders were divided into two groups of 32 each. In group I, topiramate was started at a dose of 25 mg daily and increased to 100 mg daily. In group II, patients received propranolol at a dose of 20 mg twice a day for three months. The degree of disability defined by the Migraine Disability Assessment Scale (MIDAS) was recorded.

Results: The kind of aura was sensory in 9 and 11, vision in 10 and 7, motor in 8 and 5, and other in 5 and 9 in groups I and II, respectively. MIDAS grade I was seen in 3 and 4, II in 5 and 3, III in 9 and 7, and IV in 15 and 18 in groups I and II, respectively. The mean changes in the Migraine Disability Assessment Scale (MIDAS) score before and three months in group I were -16.2 and -14.3 in group II. The difference was significant ($P< 0.05$).

Conclusion: For patients suffering from migraine with aura, there was no discernible variation in the effectiveness of topiramate and propranolol.

Keywords: Migraine With Aura, Topiramate, Propranolol.

Introduction

Based on the clinical signs, migraines with and without auras are two of the most frequent nervous system illnesses. In women, migraines are more prevalent. Before or during a migraine attack, a focused neurological condition known as an aura might develop. Visual symptoms are how auras most frequently appear; sensory, verbal, or motor symptoms occur far less frequently. Before the headache starts, about 20% of people with classic migraines have aura symptoms [1].

A migraine is a type of headache characterised by severe pain, often accompanied by other symptoms such as nausea, vomiting, sensitivity to light, and sensitivity to sound. Migraines can be debilitating and can significantly impact a person's daily life [2]. A migraine often affects one side of the head and is characterised by throbbing or pulsing pain. Physical exercise may make the pain worse and range in severity from moderate to severe. The duration of a migraine usually ranges from a few hours to several days. Premonitory (before the headache), aura (transient sensory or visual abnormalities), headache, and postdrome phases are experienced by certain persons [3]. Clinical data has demonstrated the effectiveness of divalproex, topiramate, metoprolol, propranolol, and timolol as first-line medicines [4]. Numerous studies' findings point to an improvement in quality of life (QOL) after taking topiramate as a medication to avoid migraines. D-fructose is the source of topiramate, a sulfamate-substituted monosaccharide. The medication increases inhibitory neurotransmission and decreases excitatory neurotransmission, both likely contributing factors to the pathogenesis of migraines [4]. With its wide range of effects, topiramate may function on two fronts: lowering nociceptive transmission via trigeminovascular regulation and preventing cortical spreading depression [5]. Topiramate is a class of anticonvulsant medications used to treat epilepsy and seizures, including partial, tonic, and generalised colonic seizures in adults and children older than two, as well as different epileptic syndromes and migraine attack prevention [6,7].

Aims and objectives: The present study was conducted to compare propranolol and topiramate for the prevention of chronic migraine.

Materials and Methods

The present prospective cross-sectional study consisted of 64 patients with migraine of both genders. After receiving approval from the institutional ethical committee, the present study has been carried out in the Departments of Pharmacology at Nalanda Medical College & Hospital, Patna, Bihar, India, in collaboration with the Departments of General medicine at Nalanda Medical College & Hospital, Patna, Bihar, India. The study was carried out over a one-year period, from January 2023 to December 2023. All gave their written consent to participate in the study.

Data such as name, age, gender, etc. was recorded. Patients were divided into two groups of 32 each. In group I, topiramate was started at a dose of 25 mg daily and increased to 100 mg daily. In group II, patients received propranolol at a dose of 20 mg twice a day for three months. The degree of disability defined by the Migraine Disability Assessment Scale (MIDAS) as recorded. The patients completed the MIDAS questionnaire at the beginning of the study and after 3 months of taking the drug. The data thus obtained were subjected to statistical analysis using Statistical Package for the Social Sciences (SPSS) software version 22.0. A P value < 0.05 was considered significant.

Results

Table I: Demographic characteristics of study patients in the two groups

Variables		Group I (n=32)	Group II (n=32)	P value
Mean Age (year)(mean ± SD)		28.93 ± 15.60	29.85 ± 15.01	0.70
Weight (kg) (mean ± SD)		72.50 ± 8.91	68.01 ± 8.05	0.40
Gender	Male	19 (59.37%)	18 (56.25%)	0.65
	Female	13 (40.62%)	14 (43.75%)	

SD: Standard deviation

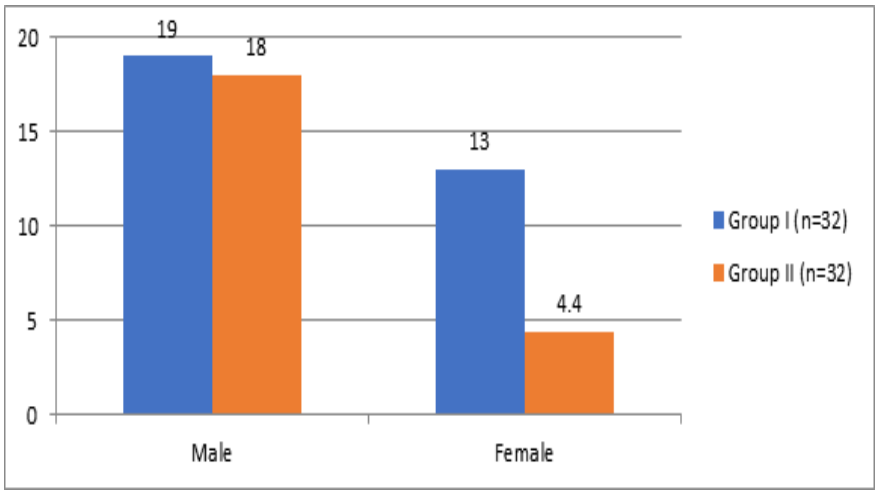

Figure 1: Gender wise distribution of study patients

Table II: Assessment of parameters

Parameters	Parameters	Group I (n=32)	Group II (n=32)	P value
Kind of aura	Sensory	9	11	0.84
	Vision	10	7	
	Motor	8	5	
	Other	5	9	
MIDAS grade	I	3	4	0.91
	II	5	3	
	III	9	7	
	IV	15	18	

Table II, figure 2, show that kind of aura was sensory in 9 and 11, vision in 10 and 7, motor in 8 and 5 and other in 5 and 9 in group I and II respectively. MIDAS grade I was seen in 3 and 4, II in 5 and 3, III in 9 and 7 and IV in 15 and 18 in group I and II respectively. The difference was significant (P< 0.05).

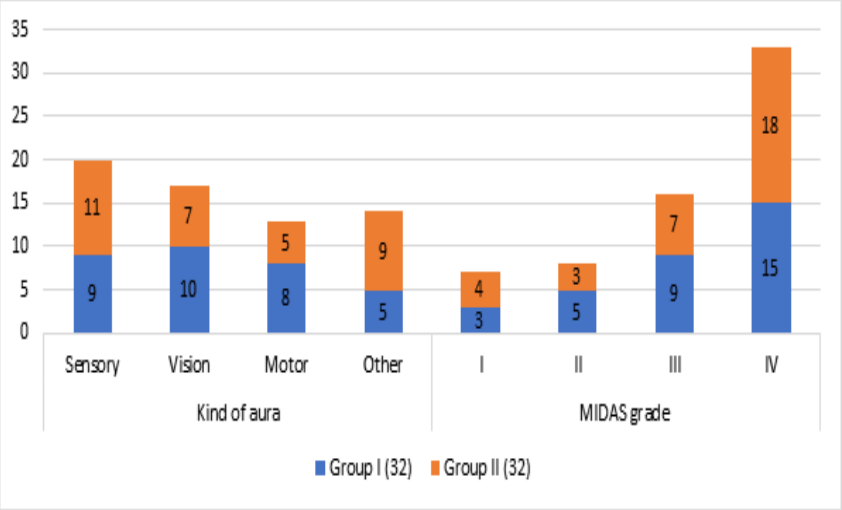

Figure 2: Assessment of parameters

Table III: Comparison of mean changes in Migraine Disability Assessment Scale (MIDAS) score before and three months after treatment in patients of both groups

Groups	MIDAS score (Mean ± SD)	P value
Group I	-16.2 ± 6.50	0.02
Group II	-14.3 ± 4.89	

Table II shows that the mean changes in Migraine Disability Assessment Scale (MIDAS) score before and three months in group I was -16.2 and in group II was -14.3. The difference was significant (P< 0.05).

Discussion

Migraines can be triggered by various factors, and triggers vary among individuals. Common triggers include stress, hormonal changes (such as during menstruation), certain foods (like chocolate, cheese, or caffeine), lack of sleep, dehydration, and environmental factors (like bright lights or strong odors). Besides headache pain, migraines often come with other symptoms [8,9]. These can include nausea, vomiting, sensitivity to light (photophobia), sensitivity to sound (phonophobia), and sometimes visual disturbances (aura), such as flashing lights or blind spots [10]. Treatment for migraines can involve both preventive measures and acute relief. Over-the-counter or prescription medications, such as nonsteroidal anti-inflammatory drugs (NSAIDs) or triptans, may be used to alleviate symptoms. Lifestyle changes, stress management, and identifying and avoiding triggers are also important components of managing migraines [11].

We found that kind of aura was sensory in 9 and 11, vision in 10 and 7, motor in 8 and 5 and other in 5 and 9 in group I and II respectively. MIDAS grade I was seen in 3 and 4, II in 5 and 3, III in 9 and 7 and IV in 15 and 18 in group I and II respectively.

Mohammadianinejad et al. [12] compared the effects of topiramate as an antiepileptic and propranolol in patients with migraine with aura. The patients were divided into two groups at random and given propranolol or topiramate. Before and after the first three months of treatment, the Migraine Disability Assessment Scale (MIDAS) score was assessed.

The reduction in the MIDAS score in patients taking topiramate (-16.94) was greater than that in the propranolol group (-14.5), but this difference was not statistically significant (P > 0.005). After treatment for both groups, there was no signif icant correlation (P > 0.050) between changes in th e MIDAS score and gender. However, the changes in the MIDAS score were greater in younger patients, and this relationship was statistically significant (P < 0.050).

We found that the mean changes in the Migraine Disability Assessment Scale (MIDAS) score before and three months in group I were -16.2 and -14.3 in group II. Choudhary et al. [13] compared the effects of topiramate and sodium valproate in the treatment of migraine. Their results revealed that the effectiveness of sodium in reducing the frequency of attacks in patients with migraine valproate was 64.44% and the effectiveness of topiramate was 56.55%, and there was a significant difference between the two groups. In a study involving eighty individuals suffering from migraine headaches, Zain et al. [14] evaluated the safety and efficacy of topiramate vs. gabapentin in migraine prophylaxis. The topiramate group had a considerably higher reduction in migraine severity and frequency of monthly attacks compared to the gabapentin group. Furthermore, the topiramate group experienced a

considerably higher reduction in the mean length of attacks (hours) compared to the gabapentin group.

Diener HC et al. [15] compared the safety and effectiveness of two topiramate doses to a placebo for the prevention of migraines, using propranolol (PROP) as an active control. A total of 575 participants were enrolled from 61 centres in 13 nations. When it came to reducing monthly migraine frequency, the overall responder rate of 50%, monthly migraine days, and the rate of daily rescue drug use of Topiramate (TPM) 100 mg/d were found to be superior to placebo. When it came to the reductions in migraine days, frequency, responder rate, and daily rescue drug use, the Topiramate (TPM) 100 mg/d and Propranolol groups were comparable.

In general, Topiramate, 100 mg/d was comparable to Propranolol and better tolerated than Topiramate (TPM) 200 mg/d. There were no unexpected or unusual safety risks. The findings show that Topiramate 100 mg/d is effective in migraine prophylaxis. Propranolol 160 mg/d and Topiramate 100 mg/d showed comparable effectiveness profiles.

Study limitations: The study's small sample size and short duration of study are one of its limitations.

Conclusion

The authors found that for patients suffering from migraine with aura, there was no discernible variation in the effectiveness of topiramate and propranolol.

Acknowledgment: The authors would like to acknowledge the entire faculty and staff of the Department of Pharmacology, Nalanda Medical College and Hospital, Patna, Bihar, India, for their valuable support and time-to-time suggestions in undertaking the present study. Special thanks to Dr. Asha Singh, Professor and Head of Department, Department of Pharmacology, Nalanda Medical College and Hospital, Patna, Bihar, India, for their valuable suggestions during the study.

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