



ВЕСТНИК
Башкирского
государственного
медицинского университета
сетевое издание ISSN 2309-7183
специальный выпуск №4



№ 4, 2024
vestnikbgmu.ru

ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ ОБРАЗОВАТЕЛЬНОЕ
УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ
БАШКИРСКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ УНИВЕРСИТЕТ
МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ

ВЕСТНИК

Башкирского государственного медицинского университета

Сетевое издание
специальный выпуск №4, 2024

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ЗАРЕГИСТРИРОВАН В ФЕДЕРАЛЬНОЙ СЛУЖБЕ ПО НАДЗОРУ В СФЕРЕ СВЯЗИ, ИНФОРМАЦИОННЫХ
ТЕХНОЛОГИЙ И МАССОВЫХ КОММУНИКАЦИЙ (РОСКОМНАДЗОР) 31.01.2020. РЕГИСТРАЦИОННЫЙ
НОМЕР В РЕЕСТРЕ ЗАРЕГИСТРИРОВАННЫХ СМИ СЕРИЯ Эл № ФС 77-77722
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FEDERAL STATE BUDGETARY EDUCATIONAL INSTITUTION OF HIGHER EDUCATION
BASHKIR STATE MEDICAL UNIVERSITY
THE MINISTRY OF HEALTHCARE OF THE RUSSIAN FEDERATION

VESTNIK

BASHKIR STATE MEDICAL UNIVERSITY

Special issue
online news outlet № 4, 2024

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FEDERAL SERVICE FOR SUPERVISION IN THE SPHERE OF COMMUNICATIONS, INFORMATION
TECHNOLOGY AND MASS COMMUNICATIONS (ROSKOMNADZOR) 31.01.2020. REGISTRATION NUMBER
IN THE REGISTER OF REGISTERED MEDIA EI No. FS 77-77722
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SCREENING OF COGNITIVE DYSFUNCTION AND DEPRESSION IN GENERALIZED EPILEPSY**Scientific Advisor - doctor of medical sciences, associate professor of department of Neurology and Neuropsychology Azizova R.B***Tashkent Medical Academy, Tashkent*

Patients' quality of life is greatly impacted by generalized epilepsy, which is frequently linked to depression and cognitive impairment. The purpose of this study is to assess the association between the severity of depression, cognitive function, and the duration of epilepsy in individuals with generalized epilepsy. We analyzed 100 patients (aged 18–60, mean age 36.5 ± 12.6) with generalized epilepsy (idiopathic, symptomatic, cryptogenic). Patients were divided into three groups based on epilepsy duration: <5 years, 5–10 years, and >10 years. Cognitive function was assessed using the Montreal Cognitive Assessment (MoCA), depression severity with the Hamilton Depression Rating Scale (HDRS), and correlations were analyzed using Spearman's test. MoCA scores declined significantly with longer epilepsy duration (Group 1: 23.4 ± 0.24 , Group 2: 22.3 ± 0.38 , Group 3: 21.6 ± 0.8 ; $p < 0.001$), indicating progressive cognitive impairment. Similarly, the length of epilepsy was associated with higher HDRS scores, indicating greater depression. According to Spearman's correlation, the length of epilepsy was positively correlated with HDRS scores and negatively correlated with MoCA scores ($p < 0.001$). Decreased cognitive function and more severe depression are linked to longer epilepsy duration. Improving patient outcomes requires early cognitive screening and focused therapy.

Keywords: Generalized epilepsy, Cognitive disorders, depression, MoCA, HDRS.

Recurrent, unprovoked seizures are the hallmark of epilepsy, a chronic neurological illness that can seriously reduce a patient's quality of life in a number of areas. Generalized epilepsies, especially idiopathic or hereditary varieties, are thought to have generally positive cognitive and psychological outcomes among the diverse range of epilepsy syndromes. However, new research indicates that this view might be unduly optimistic, given that mood disorders and cognitive dysfunction are becoming more widely acknowledged even in cases of generalized epilepsy [4,5]. The hallmark of epilepsy, a chronic neurological disorder that can significantly lower a patient's quality of life in a variety of ways, is recurrent, unprovoked seizures. Among the wide variety of epileptic syndromes, generalized epilepsies—particularly idiopathic or inherited types—are believed to have usually favorable cognitive and psychosocial results. Given that mood disorders and cognitive deficits are increasingly recognized even in situations of generalized epilepsy, recent evidence suggests that this perspective may be overly hopeful [4,5].

Through overlapping neurobiological mechanisms, such as limbic dysfunction, neuroinflammatory pathways, and changes in neurotrophic factors, depression may worsen cognitive impairment [1]. Furthermore, there appears to be a reciprocal association between seizure load and psychiatric comorbidities, since both the frequency and severity of seizures itself have been linked to greater rates of psychological distress and a lower quality of life [3].

Early and comprehensive screening for depression and cognitive dysfunction in people with generalized epilepsy is essential due to this intricate interaction. Finding these comorbidities enables

prompt therapies that may enhance results linked to seizures as well as neuropsychology. The purpose of this study is to measure the degree of depression and cognitive function in patients with generalized epilepsy, emphasizing the necessity of comprehensive neuropsychiatric evaluation in standard therapeutic practice.

Material and methods

For our study, 100 patients with generalized (idiopathic, symptomatic, cryptogenic) epilepsy aged 18 to 60 years (mean age 36.5 ± 12.6) were selected. The diagnosis was confirmed based on clinical and EEG results. Criteria such as the patients' continuous intake of antiepileptic drugs in the form of monotherapy or polytherapy, and the absence of neurodegenerative or psychiatric disorders were taken into account. We studied the patients in 3 groups:

- Group 1: Patients with generalized epilepsy for <5 years
- Group 2: Patients with generalized epilepsy for 5-10 years
- Group 3: Patients with generalized epilepsy for >10 years

To assess cognitive functions, we used the Montreal Cognitive Assessment (MoCA) test, and to assess the level of depression, we used the Hamilton Depression Rating Scale (HDRS), and to determine the relationship between the duration of epilepsy and cognitive and depressive states, Spearman correlation was used.

Results

During the study, cognitive function was assessed using the MoCA test, and significant differences were observed between the groups in terms of results. The mean MoCA score in Group 1 was 23.4 ± 0.24 , in Group 2 it was 22.3 ± 0.38 , and in Group 3 it was 21.6 ± 0.8 . (see Table 1). These results indicate that cognitive impairment in generalized epilepsy has a progressive nature. The decrease in MoCA scores between the groups was statistically significant, and a significant decrease in cognitive functions was observed as the duration and severity of epilepsy increased.

Table 1.

MoCA test results in patients with generalized epilepsy

Groups	n	MoCA
Group-1	21	23.4 ± 0.24
Group -2	52	22.3 ± 0.38
Group -3	27	21.6 ± 0.8

As shown in Figure 1. a progressive decline in cognitive function is observed, with lower MoCA scores in groups with potentially longer epilepsy duration or increased severity. Error bars represent standard deviations (SD), indicating the variability within each group.

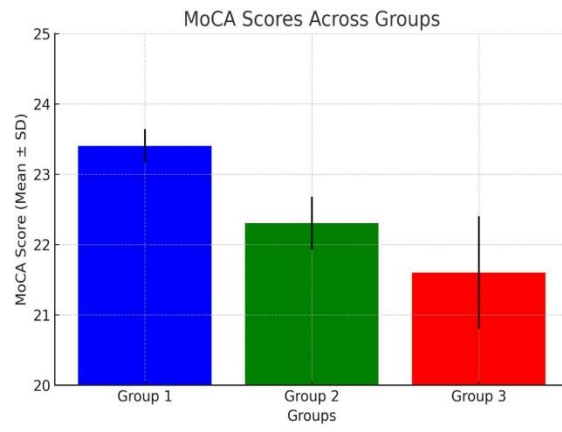


Figure 1. MoCA test results in patients with generalized epilepsy

We assessed the depressive state observed in patients using the Hamilton Depression Rating Scale (HDRS) and obtained the following results. The mean Hamilton Depression Rating Scale (HDRS) scores varied across the groups, indicating a progressive increase in depressive symptoms. Group 1 had the lowest mean HDRS score (11.8 ± 0.35), followed by Group 2 (13.7 ± 0.55) and Group 3 (15.6 ± 0.21). These results suggest that depressive symptoms are more pronounced in patients with potentially longer epilepsy duration or higher seizure burden.

Table 2.

HDRS scale results in patients with generalized epilepsy

Groups	n	HDRS
Group-1	21	11.8 ± 0.35
Group-2	52	13.7 ± 0.55
Group-3	27	15.6 ± 0.21

In Table 2 below we can see the mean HDRS scores by Groups. The results show an increasing trend in depression severity, with Group 3 exhibiting the highest score.

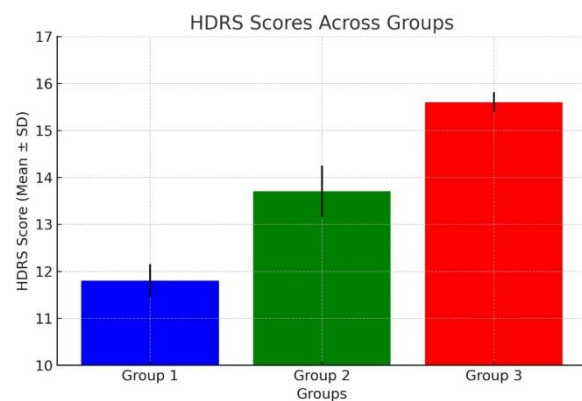


Figure 2. HDRS scores across groups

The bar chart illustrates the progressive increase in HDRS scores among the groups, suggesting a worsening of depressive symptoms in patients with more severe epilepsy. Error bars represent standard deviations (SD)

Discussion

Our study demonstrated that patients with generalized epilepsy showed significant cognitive impairment and depressive symptoms, as measured by the MoCA and HDRS scales. Group 3 exhibited the highest levels of depressive symptoms and cognitive dysfunction.

MoCA scores were significantly lower in Group 3 compared to Groups 1 and 2, indicating more pronounced cognitive impairment. Similarly, HDRS scores were highest in Group 3, suggesting a stronger association between polytherapy and depression severity.

Spearman's rank correlation analysis revealed a significant negative correlation between MoCA scores and disease duration ($\rho = -0.45$, $p < 0.001$), and a significant positive correlation between HDRS and disease duration ($\rho = 0.36$, $p < 0.001$), indicating that higher depression severity and lower cognitive function were directly related to generalized epilepsy duration in patients.

Our findings align with previous research indicating that generalized epilepsy is associated with cognitive decline and mood disorders (Pranvera Hoxhaj, et al., 2023). However, unlike previous studies, we found that Group 2 (monotherapy) also exhibited mild cognitive impairment, which may suggest an independent effect of epilepsy itself rather than solely medication. The cognitive impairment observed in generalized epilepsy patients could be attributed to chronic epileptic activity and network dysfunction in the frontal and temporal lobes. Increased HDRS scores in polytherapy patients may indicate the negative effects of multiple antiepileptic drugs on serotonergic and noradrenergic pathways.

Our study provides valuable information on the effects of epilepsy and antiepileptic therapy on cognition and mood, particularly in generalized epilepsy. The use of validated neuropsychological scales such as the MoCA and HDRS increases the reliability of our findings. Future studies should focus on longitudinal assessments to track changes in cognition and mood over time, and explore the effects of alternative therapeutic strategies, such as non-pharmacological interventions (e.g., cognitive training or mindfulness therapy), to provide new treatment options.

Conclusion

This study investigated the relationship between cognitive impairment, depression severity, and disease duration in patients with generalized epilepsy. The findings revealed a significant negative correlation between MoCA scores and epilepsy duration, indicating that longer disease duration is associated with greater cognitive decline. Conversely, HDRS scores showed a significant positive correlation with epilepsy duration, suggesting that prolonged epilepsy is linked to increased depression severity.

These results underscore the importance of early cognitive and psychiatric evaluation in epilepsy management. Given the observed associations, further research is needed to explore the underlying pathogenic mechanisms, particularly the role of neurotrophic factors in cognitive impairment and depression. Future studies should also focus on optimizing treatment strategies to mitigate these complications and improve the quality of life for patients with generalized epilepsy.

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