

## ASSESSING THE DEGREE OF RISK FACTORS' SIGNIFICANCE FOR THE DEVELOPMENT OF POST- TRAUMATIC EPILEPSY

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### Abstract

Epilepsy is a widespread chronic neurological disease. The problems for people with epilepsy go far beyond seizures. Comorbidities associated with epilepsy are very common and often cause more problems for patients than the seizures themselves. Although seizures are the most prominent clinical manifestation of epilepsy, people with epilepsy are at risk not only for seizures, but also for a variety of health problems. Both children and adults with epilepsy often complain of memory impairment. It is generally accepted that cognitive impairment in epilepsy is multifactorial. Components that impair cognitive function include active seizures and in particular generalized tonic-clonic seizures, traumatic brain injury, structural epilepsy, and drug therapy. Cognitive impairment is very often present already during the onset of epilepsy.

**Keywords:** therapy, epilepsy, cognitive impairment, concomitant diseases, phenosanic acid.

### Introduction

Epilepsy is a common chronic neurological disorder with social, behavioral, health and economic consequences. Epilepsy is a chronic neurological disease characterized by recurrent seizures (with an interval > 24 hours), one seizure with a high probability of recurrence (at least 60%) or a diagnosis of epilepsy syndrome [1]. More than 70 million people worldwide suffer from epilepsy [2]. The vast majority of patients with epilepsy can live normal lives with adequate treatment, but some patients have serious comorbidities such as mental disorders and cognitive impairment (CI). In long-term epilepsy, CIs are observed in approximately 70–80% of patients, and depressive mood – in 60% [3, 4].

### MATERIALS AND METHODS

Historically, the idea that epilepsy causes progressive cognitive decline dates back to the term “epileptic dementia,” which was coined at the turn of the 19th century. German

psychiatrist Emil Kraepelin [5], and then German psychiatrist and neurologist Oswald Bumke [5] wrote about epileptic dementia and epileptic character. E. Kraepelin noted that more than 50% of patients with epilepsy develop a pronounced, strange form of dementia, which is characterized by general slowness and clumsiness of all mental abilities [5].

There is now increasing evidence that epilepsy may be associated with comorbid conditions such as learning problems, psychological and behavioral disorders. Comorbid conditions vary in type and severity: from subtle learning difficulties to severe disorders of intellectual and mental functions, such as autism spectrum disorders, depression and problems with adaptation in society. When diagnosing a patient with epilepsy, it is important that the presence of comorbid conditions is given due attention at an early stage in order to ensure their early identification, diagnosis and proper control [1].

## RESULTS AND DISCUSSION

Cognitive and behavioral disorders can precede the onset of epilepsy, appear after the onset of seizures, and progress as the disease develops [2]. Thus, a review summarizing 11 studies involving more than 500 untreated adult patients with newly diagnosed epilepsy noted that about 70% of patients showed some cognitive deficit when formally tested using psychometric tests for attention and memory [3]. Consequently, cognitive screening for new-onset epilepsy should become a routine assessment, including for the adult population [4]. Information regarding the patient's cognitive status at the onset of epilepsy and before treatment allows the clinician to monitor the course of the disease and relate potential changes that may occur to the success or failure of treatment, side effects of antiepileptic drugs (AEDs) and the course of the underlying pathology.

Age is another factor for CI in patients with epilepsy. Various studies have shown that older patients are more prone to obvious impairments in psychomotor reaction time [2], memory and executive functions. In a study of 38 individuals aged  $65.21 \pm 7.87$  years (52.6% women), older adults with epilepsy demonstrated greater cognitive deficits than controls. CIs were found in all cognitive areas in the group with epilepsy, including 39.5% with visual memory impairment, 23.7% each with attention and executive function impairment, 18.4% with visuospatial skills and 15.8% - with both verbal memory and speech. Polytherapy and anxiety increased the risk of CI. Possible explanations may be:

- a) patients with epilepsy have normal age-related cognitive decline;
- b) older age means a longer course of the disease, a greater number of drugs and drug interactions, a greater number and severity of concomitant pathologies, changes in metabolic rate and a natural increased tendency to develop CI.

Therefore, it is necessary to pay more attention to the cognitive function of middle-aged and elderly patients with epilepsy and improve their quality of life in the future.

Recently, depression and anxiety are considered the most common mental problems in patients with epilepsy. Depression and anxiety are common among people with epilepsy, ranging from 20 to 60% [2]. Whether they are associated with CI in epilepsy is still under investigation. Depression has been shown to be closely associated with a decrease in the

speed of psychomotor development [3]. In addition, depression and anxiety may also increase the side effects of AEDs and determine their tolerability [4].

The main purpose of AEDs is to reduce the frequency and severity of epileptic seizures, and these drugs have an optimal side effect profile. There are approximately 30 types of AEDs available on the market as first-, second- and third-line drugs, depending on the type of attack, age, physical condition and the patient's current use of other medications. Despite extensive experience and recently updated recommendations for seizure control in patients with epilepsy, there are relatively limited data on the choice of AEDs for cognitive disorders. Antiepileptic therapy may have a positive effect on cognitive function and behavior through control of seizures and reduction of persistent interictal epiactivity and (or) through improvement in the emotional sphere and concomitant mental disorders. Analysis of numerous experimental and clinical data makes it possible to assess the role of oxidative stress in the pathogenesis of epilepsy and comorbid neuropsychiatric disorders [5].

Intensification of lipid peroxidation processes against the background of oxidative stress leads to changes in the structural organization of membranes (phospholipid composition, microviscosity and ionic permeability), disruption of the functions of membrane-bound enzymes and receptors, which leads to the development of paroxysmal disorders and disorders of mental functions that reduce the quality of life.

## CONCLUSION

Epilepsy is a neurological disorder characterized by recurrent, unprovoked seizures. CIs are often observed in patients with epilepsy. Various factors can contribute to the development of CI, including etiology, topography of the epileptiform region, persistent interictal EEG abnormalities, pathogenetic mechanisms, the presence of mental disorders, and concomitant diseases. Worse indicators in terms of memory, attention and speech correlate with the duration of the disease, the age of the patient, and an earlier onset of epilepsy. Use of more than one AED is associated with an increased risk of decline in cognitive functions, especially executive and attentional functions.

Thus, CIs in epilepsy are the result of complex interactions between morphological, clinical and demographic, as well as functional factors. CIs can cause a significant decrease in the quality of life of patients with epilepsy, which is why it is necessary to assess the patient's cognitive functions already at the first visit to determine further tactics for managing each patient with epilepsy individually.

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