



FEATURES OF COGNITIVE DISORDERS

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Abstract. *The problem of cognitive disorders and dementia, as an extreme degree of their manifestation, is incredibly relevant today. According to WHO statistics, annually around the world about 10 million people with cognitive impairments reach the degree of dementia, more than 50 million people are diagnosed with this disease. If forecasts are to be believed, by 2050 up to 22% of the world's population will suffer from dementia.*

Keywords: *memory, memory impairment, cognitive impairment, dementia, dyscirculatory encephalopathy, chronic cerebral ischemia, diagnosis, examination.*

The higher brain function or cognitive function is the most complex function of the nervous system, which is responsible for rational perception, cognition and interaction with the outside world. There are several of them, depending on different authors, but in general, these are memory, praxis, gnosis, speech and executive functions. They are important for us not only in the implementation of some complex highly intelligent tasks, but also in the most routine household activities. One of the most common neurological symptoms is cognitive impairment.

Since cognitive functions are associated with the integrated activity of the brain as a whole, cognitive impairment naturally develops with a wide variety of focal and diffuse brain lesions. Especially often cognitive disorders occur in old age. According to statistics, from 3 to 20% of people over 65 years of age have severe cognitive impairment in the form of dementia. The incidence of milder cognitive impairment in the elderly is even greater and, according to some reports, reaches from 40 to 80%, depending on age. The current trend towards an increase in life expectancy and, accordingly, to an increase in the number of elderly people in the population makes the problem of cognitive impairment extremely relevant for neurologists and doctors of other specialties.

Cognitive functions are usually understood as the most complex functions of the brain, with the help of which the process of rational knowledge of the world is carried out. Cognitive functions include memory, gnosis, speech, praxis, and intellect. Memory is the ability of the brain to assimilate, store and reproduce information necessary for current activity. The function of memory is associated with the activity of the entire brain as a whole, but the structures of the hippocampus circle are of particular importance for the process of remembering current events. Severe impairment of memory for life events is commonly referred to as amnesia.

Genesis is the function of information perception, its processing and synthesis of elementary sensory sensations into integral images. Primary violations of gnosis (agnosia) develop in the pathology of the posterior sections of the cerebral cortex, namely the temporal, parietal and occipital lobes. Speech is the ability to exchange information through utterances. Speech disorders (aphasia) most often develop in the pathology of the frontal or temporo-parietal regions of the brain. At the same time, the defeat of the temporo-parietal parts leads to various kinds of speech



comprehension disorders, and in the pathology of the frontal lobes, the ability to express one's thoughts with the help of speech utterances is primarily impaired.

Praxis is the ability to acquire, maintain and use a variety of motor skills. Praxis disorders (apraxia) most often develop in the pathology of the frontal or parietal lobes of the brain. At the same time, the pathology of the frontal lobes leads to a violation of the ability to build a motor program, and the pathology of the parietal lobes leads to the improper use of one's body in the process of a motor act with a safe program of movements. Intelligence is understood as the ability to compare information, find common and differences, make judgments and conclusions. Intellectual abilities are provided by the integrated activity of the brain as a whole. Neuropsychological research methods are used to assess cognitive functions. They are various tests and tests for memorizing and reproducing words and pictures, recognizing images, solving intellectual problems, studying movements, etc. A complete neuropsychological examination makes it possible to identify the clinical features of cognitive impairment and make a topical diagnosis. However, in everyday clinical practice, it is not always possible to conduct a complete neuropsychological study. Therefore, in outpatient practice around the world, the so-called screening neuropsychological scales are widely used, which allow confirming the presence of cognitive disorders in general and quantifying them.

Syndromes of cognitive impairments. Focal damage to the brain leads to a violation of one or more cognitive functions, which are based on a single pathogenetic mechanism. This kind of cognitive impairment is characteristic of the consequences of a stroke, brain contusion, or develops with a brain tumor. However, in the most common neurological diseases, brain damage is not limited to one focus, but is multifocal or diffuse. In such cases, a violation of several or all cognitive functions develops, and several pathogenetic mechanisms for the formation of disorders can be traced. Cognitive impairment in multifocal or diffuse brain damage is usually classified according to the severity of the impairment.

The most severe type of disorder of this kind is dementia. The diagnosis of dementia is valid in the presence of memory impairment and other cognitive disorders that are so pronounced that they directly affect daily life. The conditions for the diagnosis of dementia are also a clear consciousness of the patient and the presence of an established organic brain disease, which is the cause of cognitive impairment. Dementia is most commonly seen in the elderly. The most common cause of dementia is Alzheimer's disease (AD). AD is a degenerative brain disease associated with the progressive death of acetyl cholinergic neurons. Usually this disease begins after 65 years. The first and main symptom of AD is progressive forgetfulness of life events. In the future, violations of spatial orientation and speech join amnesic disorders. At the advanced stages of AD, the independence of patients is lost, and there is a need for outside help.

The presence of focal neurological symptoms in combination with mild or moderate dementia is evidence against the diagnosis of AD or indicates a combination of this disease with another brain pathology, most often vascular. Cerebrovascular insufficiency is the second cause of dementia in the elderly after AD. At the same time, the immediate cause of brain damage is repeated strokes, chronic cerebral ischemia, or, most often, a combination of repeated acute disorders and chronic cerebrovascular insufficiency. The clinical picture of vascular dementia differs significantly from AD. At the same time, memory impairments for life events are relatively unexpressed, and intellectual disorders come to the fore of the clinical picture. Patients have difficulty in generalizing, identifying similarities and differences between concepts, developing a significant slowness of thinking and a decrease in concentration.

Unlike AD, vascular dementia is almost always characterized by a combination of cognitive impairment and focal neurological symptoms. At the same time, the syndrome of discirculatory encephalopathy (DE) is formed. The most typical manifestations of DE are pseudobulbar syndrome,



hyperkinesia, increased muscle tone according to the plastic type, asymmetric increase in tendon reflexes, gait disturbance, and pelvic disorders. The absence of these focal neurological disorders makes the diagnosis of vascular dementia highly questionable. Important in the differential diagnosis of AD and vascular dementia is neuroimaging - computed or magnetic resonance imaging of the brain. In AD, pathological changes on neuroimaging may be absent or represent cerebral atrophy, most pronounced in the hippocampus. In contrast, vascular dementia is characterized by significant neuroimaging changes in the form of brain infarcts and diffuse rarefaction of white matter density.

AD and vascular dementia have common risk factors, such as advanced age, arterial hypertension and atherosclerosis of cerebral vessels, carriage of the APOE4 gene, and some others. Therefore, very often AD and cerebrovascular insufficiency coexist. Clinical and morphological comparisons indicate that almost half of the cases of AD have cerebral infarctions and leukoaraiosis. On the other hand, 77% of elderly patients with a lifetime diagnosis of AD have morphological signs of a concomitant neurodegenerative process. In such cases, it is customary to speak of a mixed (vascular-degenerative) etiology of dementia. Many authors suggest that the prevalence of mixed dementia exceeds the prevalence of "pure" AD or "pure" vascular dementia.

In addition to AD, vascular and mixed dementia, other degenerative diseases of the brain, traumatic brain injury, brain tumors, malabsorption of cerebrospinal fluid from the ventricles (the so-called resorptive hydrocephalus), neuroinfection, dysmetabolic disorders, etc. can be the causes of severe cognitive impairment. The literature mentions several dozen nosological forms that can lead to dementia. However, the prevalence of these diseases is not comparable with the prevalence of AD, vascular and mixed dementia. The last three indicated nosological forms are responsible, according to statistics, for 70-80% of dementia in old age. Dementia is the most severe cognitive impairment. In most cases, dementia develops gradually. At the same time, less pronounced disorders prevent severe cognitive impairment. Moderate cognitive impairment (MCI) is a deficiency of one or more cognitive functions that are beyond the age norm, but do not limit daily activities, that is, do not cause dementia.

MCI is a clinically defined syndrome. With it, cognitive disorders cause anxiety of the patient himself and attract the attention of others. The diagnosis of MCI is confirmed by the data of neuropsychological research methods, which reveal a more pronounced decrease in cognitive functions than is acceptable for age. According to epidemiological data, MCI syndrome occurs in 10-15% of the elderly. The risk of developing dementia in this category of the elderly population significantly exceeds the average risk (10-15% per year compared to 1-2%). Long-term observations indicate that within 5 years, 55-70% of patients with MCI develop dementia. The causes of MCI syndrome repeat the causes of dementia in old age. The most common cause of MCI is a neurodegenerative process, cerebrovascular insufficiency, or a combination of both.

The causes of MCI syndrome repeat the causes of dementia in old age. The most common cause of MCI is a neurodegenerative process, cerebrovascular insufficiency, or a combination of both. It is known that, on average, according to statistics, the cognitive abilities of a person gradually decrease, starting from the age of 20-30. In 1994, the World Psychogeriatric League proposed the use of a specific diagnostic stance, aging-associated cognitive decline (AACD), to refer to mild, predominantly age-related cognitive decline in the elderly. However, in practice, it is very difficult to distinguish between natural age-related cognitive decline and cognitive impairment associated with the earliest manifestations of vascular and degenerative diseases of the brain. Therefore, from our point of view, the term "mild cognitive impairment" is more correct.

Examination of patients with cognitive impairments. Complaints about memory loss or a decrease in mental performance are the basis for a neuropsychological examination. At the same time, such complaints can come from the patient himself, as well as from his relatives or immediate



environment. The latter is a more reliable diagnostic sign, since the patient's self-assessment of the state of his cognitive functions is not always objective. In routine clinical practice, neuropsychological testing may be limited to simple screening scales such as the Mini-Mental Status Scale. Complicating the neuropsychological study protocol is not always advisable. The use of complex tests, increasing the sensitivity of the method, leads to a decrease in the specificity of the results obtained, since the performance of complex tests to a large extent depends on the age and level of education.

However, in about half of patients with active complaints of memory loss, the use of simple screening scales does not confirm the presence of cognitive impairment. The most common cause of subjective complaints about memory loss in the absence of objective confirmation is emotional disorders in the form of increased anxiety or a decrease in mood. Therefore, all patients with complaints of memory loss should carefully evaluate the emotional sphere. The likelihood of depression is especially high with complaints of memory loss in young or middle-aged people. Another reason for the lack of objective confirmation of cognitive impairment in active memory complaints is the insufficient sensitivity of screening neuropsychological scales. Therefore, in addition to the assessment and medical correction of the emotional state, in such cases it is advisable to dynamically monitor the patient and repeat clinical and psychological studies with an interval of 3-6 months.

It is important to investigate not only the somatic status of the patient, but also his emotional state. It has already been said above that emotional disorders of the anxiety-depressive series can cause subjective cognitive disorders. However, severe depression can also cause objective cognitive impairment and even mimic dementia. If depression is suspected in an elderly person, antidepressants may be prescribed.

Thus, cognitive impairment is one of the most common neurological symptoms, especially in elderly patients. To identify cognitive disorders, it is necessary to use neuropsychological methods and research. In everyday clinical practice, these can be simple screening scales, the application and interpretation of which does not require special psychological education or experience. Therapy for cognitive impairment depends on their severity and etiology.

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