Prognostic Value of Various Pathogenetic Variants of Transient Ischemic Attacks

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Abstract

Transient ischemic attack (TIA), being a precursor of stroke, increases the risk of its development up to 30%, low awareness of the population about the symptoms of TIA, can cause late hospitalization of patients with its development and thereby contribute to the occurrence of stroke and reduce the effectiveness of treatment. The use of the ABCD2 scale (age, arterial hypertension, presence of paresis and aphasia, duration of symptoms more than 60 minutes, diabetes mellitus), which is simple in practical use, can be of prognostic value for hospitalization of these patients. It is necessary to start secondary prevention of stroke as early as possible the issue of choosing modern methods of prevention and treatment of patients with TIA, the choice of the optimal method of surgical treatment of patients with carotid artery stenosis is currently not completely resolved.

Keywords: Transient ischemic attack, stroke, prognosis, pathogenesis, atherosclerosis, diagnosis, prevention, treatment

Introduction

The issue of cerebral stroke remains of extreme social and medical significance throughout the world [1]. According to the WHO, stroke is the leading cause of disability in the adult population. Violation of cerebral circulation is a concept that includes not only a stroke, but also transient disorders of cerebral circulation or transient ischemic attacks (TIA). On the basis of MRI data, it was found that with TIA duration of more than 1 hour, persistent foci of ischemia appear in the brain. Therefore, at the suggestion of the World Stroke Organization, the diagnosis of TIA can be made only if the duration of symptoms does not exceed 60 minutes and is completely resolved. Otherwise, the diagnosis is "stroke" [5]. TIA, being a precursor to stroke, increases the risk of stroke development up to 30%, which is 9 times higher than that in the general population [2]. To assess the risk of stroke, a special ABCD 2 scale was proposed, which is used to assess the risk of developing early stroke after a TIA and to identify patients who should be hospitalized. This scale takes into account age over 60 years, blood pressure above 140/90 mm Hg,

presence of clinical symptoms duration of symptoms over 60 minutes, diabetes mellitus. Patients with TIAs with a score of 2 or more should be hospitalized for further examination and treatment [5].   The causes of TIA are manifold. These include: arterial hypertension of any origin, heart disease, atrial fibrillation, a history of myocardial infarction, dyslipoproteinemia, diabetes mellitus, asymptomatic carotid artery disease pathology of small cerebral vessels, cervical osteochondrosis, left ventricular aneurysm, artificial heart valve, rheumatic valve disease heart, bacterial endocarditis and others. An important role in the development of TIA is also played by risk factors associated with lifestyle: tobacco smoking, alcohol abuse, overweight, contraceptive use, malnutrition, psycho-emotional stress, migraine headaches [2, 3, 5, 7].

The Main Findings and Results

The pathophysiological basis of the clinical manifestations of TIA is the presence in the brain of ischemic penumbra zones, which have a complex molecular geneticbiochemical, cellular and spatial structure, which is characterized by multifactorial dynamic transformation [1,2]. The clinical picture at the onset of TIA corresponds to ischemic stroke and is often manifested by mild neurological disorders (numbness of the face and hands, mild hemiparesis, or monoparesis, speech disorders are possible, decreased vision in one eye). TIAs can be repeated several times a day for a long time. A significant proportion of patients with ischemic stroke (20-30%) had TIAs earlier, which indicates their important prognostic value [1, 2, 5]. Among ischemic strokes, there are atherothrombotic, embolic, hemodynamic and lacunar strokes [5].

Transient ischemic attacks (TIAs) of arterio-arterial or cardiac embolism usually occur suddenly. The clinical picture at the onset of TIA corresponds to ischemic stroke. TIAs are often manifested by mild neurological disorders (numbness of the face and hands, mild hemiparesis or monoparesis of the hand), although severe disorders are also possible (hemiplegia total aphasia) .There is often a short-term decrease in vision in one eye (circulatory disorders in the orbital artery). Usually, neurological disorders persist with TIA, only a few minutes, and may recur several times a day for a long time. Often, many patients do not attach significant importance to transient short-term disorders and do not seek medical advice, so it is difficult to assess the prevalence of TIA. However, a significant proportion of patients had previously developed TIAs, which indicates their important prognostic value [5].

One of the main causes of lesions of extracranial arteries leading to cerebral ischemia is atherosclerosis. Atherosclerotic lesions of the cerebral arteries are the cause of 40-45% of all cases of ischemic cerebral circulation disorders [9]. Currently, there is no doubt about the concept of pathogenetic heterogeneity of ischemic stroke, and the most frequent (more than a third of cases) is the atherothrombotic type associated with damage to extracranial arteries, primarily carotid arteries. The

hemodynamic mechanism of stroke development plays an important role in severe stenosis and occlusions of the internal carotid artery [9].

The increasing frequency of ischemic strokes, four times higher than hemorrhagic ones, a high frequency of transient ischemic attacks, lacunar cerebral infarctions, an increase in the prevalence of repeated ischemic cerebrovascular accidents, as well as chronic progressive cerebrovascular pathology, including vascular dementia, lead to an intensive study of issues of pathogenesis, diagnosis, treatment and prevention of atherosclerotic lesions [9].

Currently existing methods of both primary and secondary prevention of cerebrovascular accidents can be divided into conservative and surgical. In numerous multicenter randomized trials, the effectiveness of surgical correction of stenosis of the carotid artery for the secondary prevention of cerebral circulation disorders in patients with severe (more than 60-70%) carotid stenosis, who underwent transient ischemic attacks and minor stroke, has been convincingly proven [8, 9]. This is especially true since the risk of recurrent ischemic stroke is 10-15% during the first year, then the frequency of recurrent strokes is 5% annually, 15 times higher than the frequency of stroke in the general population.

However, to date, there are few works in which a comprehensive clinical, neurological, neuropsychological examination of patients with various pathogenetic variants of TIA, namely with occlusive lesions of the brachiocephalic arteries, was performed, taking into account the localization, degree of prevalence and structural features of atherosclerotic lesions, as well as other risk factors for development ischemic brain disease. There are contradictory data on the effect of surgical correction of atherosclerotic carotid stenosis on clinical, neurological and neuropsychological functions. Many authors [8, 9] in their studies noted the positive effect of surgical correction of atherosclerotic carotid stenosis on clinical neurological and neuropsychological functions.

All patients must undergo an ultrasound examination of the carotid arteries before surgery, after which the question of choosing a method of surgical treatment is decided. When deciding on surgical treatment, the degree of cerebral artery stenosis, the prevalence of atherosclerotic lesions, the patient's age, and the presence of concomitant somatic diseases are always taken into account.

All surgical operations are aimed at eliminating stenosis of the cerebral arteries and are divided into 2 types: carotid endarterectomy (CEE) and an alternative to CE is minimally invasive endovascular intervention with stent placement (Smout J., 2010).

Carotid angioplasty and stenting for the prevention of ischemic stroke, (CAS) has been in use since the mid-1980s. CAS reduces the painfulness of manipulations and the length of stay in the hospital, and also does not leave postoperative scars, compared with CEE. The absence of the need for general anesthesia is another great advantage of the endovascular technique. Modern X-ray endovascular approaches to stenting cerebral arteries make it possible to perform operations as early as possible after

the onset of the disease, and with careful selection of patients, this method is highly effective for elderly patients [8, 9].

Conclusion

Thus, low awareness of the population about the symptoms of TIA can be the reason for the late hospitalization of patients with its development and thereby contribute to the occurrence of stroke and reduce the effectiveness of treatment. The use of the ABCD2 scale (age, arterial hypertension, presence of paresis and aphasia, duration of symptoms more than 60 minutes, diabetes mellitus), which is simple in practical use, can be of prognostic value for hospitalization of these patients. It is necessary to start secondary stroke prevention as early as possible, because the majority of ischemic strokes in TIA patients occur in the first days after the illness. The question of the choice of modern methods of prevention and treatment of patients with TIA, the choice of the optimal method of surgical treatment of patients with stenosis of the carotid arteries is currently not completely resolved. Further study of risk factors for each of the methods is urgent. Considering that such measures represent an effective alternative to drug therapy, it is of undoubted interest to compare dynamic study of the state of patients undergoing stenting of the ICA, CEE and patients receiving drug therapy, it is necessary to study short-term and long-term effects, require clarification of the dynamics of neurological deficits and carrying out the above methods. The goal of treating patients with TIA is to prevent subsequent TIAs and the development of stroke. The study of this problem can provide more accurate criteria for the optimal choice of modern methods of diagnosis, prevention and treatment of patients with transient ischemic attacks.

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