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# Clinical and neurological factors in the formation of an individual predisposition to COVID-associated ischemic stroke

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***Abstract: Providing the population with high-quality and affordable medical care is an important and priority area of healthcare in Uzbekistan. The planned dissertation work is devoted to the development and improvement of diagnostic and rehabilitation measures taking into account risk factors, clinical course and differential diagnosis of this pathology. The data obtained during the study lead to an improvement in the quality of life of patients with this pathology. This determines the priority areas of research and development in the Republic.***

***Keywords: COVID, Clinical, stroke.***

## 1. INTRODUCTION

Stroke is currently the leading cause of disability and one of the leading causes of death in the world. Among patients who survived after a stroke, movement disorders are observed by the end of the acute period of stroke in 85% of patients, by the end of the first year - in 70%, speech disorders (aphasia) by the end of the acute period - in 36%, by the end of the first year - in 18% of patients ... Ischemic stroke accounts for 60% to 80% of all reported cases. The complex biological nature of disorders leading to stroke is a consequence of the interaction of many risk factors, including both non-modifiable (age, gender, race and ethnicity, heredity, etc.) and modifiable factors (high blood pressure, diabetes , high cholesterol, atrial fibrillation, overweight, lifestyle). Modifiable risk factors are responsible for no more than 60% of the general population risk of ischemic stroke.

The 2019-2020 coronavirus infection pandemic demonstrated not only the high aggressiveness of the new infectious agent, but also its ability to cause severe cardiovascular complications. In recent decades, ischemic stroke (IS) has been one of the leading causes of death in older age groups (Mozaffarian D., Benjamin E., Go A. et al., 2016). A generalization of the first results of treatment of victims of coronavirus infection showed that the development of IS in such patients is very likely. The high mortality rate of elderly patients infected with COVID-19 is partly associated with the development of fatal cardiovascular complications, the most severe of which is stroke (Luker A., Peyvandi L., 2019; Tang N, Li D, Wang X, Sun Z. 2020).

An analysis of the few available publications that mention the problem of COVID-associated

ischemic stroke can show not only the significance of the problem, but also reveal the mechanisms of acute cerebral ischemia. The prevention of acute cerebrovascular accidents (ACVI) in those infected with COVID-19 seems to be one of the important clinical tasks that need to be addressed in conditions of high workload in specialized hospitals and a shortage of specialists.

Compliance of the topic of the thesis with the state scientific and technical program and priority areas of research in the Republic of Uzbekistan**.**

Providing the population with high-quality and affordable medical care is an important and priority area of healthcare in Uzbekistan. The planned dissertation work is devoted to the development and improvement of diagnostic and rehabilitation measures taking into account risk factors, clinical course and differential diagnosis of this pathology. The data obtained during the study lead to an improvement in the quality of life of patients with this pathology. This determines the priority areas of research and development in the Republic.

Connectivity of work with state programs or thematic plans of research.

The dissertation work was performed in accordance with the research plan of the Bukhara State Medical Institute

The degree of knowledge of the problem.

According to the data of the first publications, which analyzed the neurological complications of coronavirus infection, acute cerebrovascular accidents (ACA) were found in 6% of patients. The first generalizations of clinical observations show that syndromes of thrombotic occlusion of large arteries prevail in the structure of pathogenetic subtypes of ischemic stroke (IS). In addition, a high frequency of impaired consciousness (more than 15% according to Mao L. 2020) may indicate the possibility of diffuse brain damage of the type of acute (toxic, hypoxemic, ischemic) encephalopathy.

To clarify the pathogenesis of acute cerebral ischemia, it is currently accepted to distinguish the pathogenetic subtypes of IS in accordance with the TOAST etiological classification. According to this classification, about 80% of all AIs are distributed between the main subtypes - atherothrombotic (atherosclerotic disease of large arteries), cardioembolic (the main cause is atrial fibrillation), lacunar (microangiopathy is a disease of small arteries). Formally, CVA against the background of coronavirus infection can be classified as “other established causes”. However, there are several important arguments against this formal allocation. These arguments call for a more detailed analysis of the causes and mechanisms of COVID-associated ischemic stroke. The first argument is based on the assumption that this form of stroke is not associated with atherosclerosis, and therefore has an original pathogenesis and a completely different etiology. The second argument is based on evidence of the involvement of an active inflammatory process in the pathogenesis of COVID-associated ischemic stroke. Finally, the third argument comes from the established practice of treating such patients. In contrast to standard methods of treatment based on the use of antiplatelet and lipid-lowering therapy to prevent atherothrombosis, anticoagulants show better results in patients with coronavirus infection (does not comply with current clinical guidelines) [4].

Analysis of clinical data shows that patients suffer a stroke during the acute period of coronavirus infection against a background of hyperthermia and often pneumonia. Stroke is

characterized by a large-focal lesion in the carotid vascular system, more like a syndrome of thrombotic occlusion of a large artery. A significant difference between COVID-dependent atherothrombotic IS is the absence of a connection between a thrombus and an atherosclerotic plaque and the presence of signs of inflammation of the vascular wall. D.McNamara (2020) draws attention to the inflammation and edema of the arteries of the vascular basin in which cerebral infarction develops, which can be regarded as acute vasculitis. Inflammation and edema of the vascular wall directly or indirectly associated with exposure to a virus or an autoimmune reaction is possible, but not an obligatory sign of the development and generalization of the infectious process. Moreover, neurological syndrome associated with inflammation of large arteries is more rare than a regularity.

Analysis of the first data containing a comparison of the clinical picture of stroke and the results of laboratory tests can to some extent explain the fact and frequency of the development of large artery disease syndrome. L. Mao et al. (2020) present an analysis of laboratory data of 124 patients who were hospitalized with coronavirus infection. The average age of the patients was 54 years, the severe course of the disease was noted in 59%. Cerebrovascular syndromes were detected in 6% of patients, all in the group with severe course.

Determination of predictors and biomarkers of an aggressive course of the disease is an important scientific and practical task, the solution of which will allow avoiding such severe complications as stroke. However, the possibility of such hyperreactivity suggests the use of active immunosuppression when signs of vasculitis appear.

The hypercoagulable status of patients with coronavirus infection is another important factor in changing the stable course of diseases associated with atherosclerosis.

Purpose of the study: is the development and improvement of the differential diagnostic criterion and rehabilitation and recovery measures in patients with COVID-associated ischemic stroke.

**Research objectives**

1. Determine the prevalence and anatomical forms of COVID-associated ischemic stroke using neuroimaging methods;
2. To identify factors influencing the outcome of COVID-associated ischemic stroke;
3. To establish biomarkers of thrombus formation in COVID-associated ischemic stroke.
4. Develop preventive measures for COVID-dependent AI;
5. To optimize rehabilitation and recovery measures among patients with COVID-associated ischemic stroke.

Object of research. Patients with COVID-associated ischemic stroke who were treated in hospitals of the Republic of Uzbekistan.

Research methods. General clinical, laboratory and instrumental research methods were used to achieve the research goal and solve the assigned tasks.

Scientific novelty of the research.

the role of various risk factors in the occurrence of COVID-associated ischemic stroke will be identified;

the optimal volume, timing and duration of a complex of treatment, prophylactic, and rehabilitation measures for COVID-associated ischemic stroke at different stages of medical care and at different stages of their development will be determined;
unified criteria for the development of COVID-associated ischemic stroke will be developed;
The practical significance of the work.
factors influencing the outcome of COVID-associated ischemic stroke will be identified
biomarkers of thrombus formation in COVID-associated ischemic stroke will be established;
a set of preventive measures for COVID-associated ischemic stroke at all stages of medical care for patients with this pathology will be developed and put into practice.
the results of a study to improve medical care for patients with COVID-associated ischemic stroke in diagnosis and treatment and prophylactic measures will be implemented in specialized medical institutions.