



## STUDY OF LEADING RISK FACTORS IN THE JOINT DEVELOPMENT OF MYOCARTICAL INFARCTION AND ISHEMIC DISORDERS OF THE BASIC CIRCULATION

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<p><b>Received:</b> April 10<sup>th</sup> 2021 <b>Accepted:</b> April 23<sup>rd</sup> 2021 <b>Published:</b> May 21<sup>th</sup> 2021</p>	<p>Serious problems with blood circulation in the bashmia are also associated with the pathology of the heart system, the scientific work covered in this article will be exactly on the ischemic state of the bashmia blood vessels in patients with observed Cardiac Vascular Pathology.</p>
<p><b>Keywords:</b> Thrombus, stroke, inferkt, hemodynamics, vascular devoir.</p>	

New therapeutic and diagnostic achievements of modern medicine, the introduction of highly effective pharmacological agents into practice and the development of cardiovascular surgery still do not solve the problem of high mortality and disability in the development of myocardial infarction and acute cerebrovascular accident.

Every year in our country, more than 450 thousand people suffer from acute cerebrovascular accident, and up to 80% of the survivors remain disabled of varying severity. Mortality from stroke in Uzbekistan remains one of the highest in the world (374 per 100 thousand population) [8]. It is known that mortality in acute cerebrovascular accident in the early stages (30 days) is 32–42%, and during the year it increases to 48–63% [9].

Multifocal atherosclerosis is a common pathogenetic factor in the development of myocardial infarction and ischemic stroke with concomitant damage to the coronary and carotid arteries. According to various authors, in patients with hemodynamically significant atherosclerosis of the coronary arteries, carotid lesions reach 30%, which significantly worsens the prognosis in patients with coronary artery disease in the general population (the survival rate within 5 years does not exceed 50%) [6]. In patients with acute ischemic cerebrovascular accident, coronary atherosclerosis is diagnosed in 30-60% of patients [1]. The generally recognized factors for the progression of atherosclerosis include hyperlipidemia, arterial hypertension, smoking, impaired carbohydrate metabolism, overweight and other factors, the correction of which can significantly reduce the risk of death from cardiovascular diseases and prevent the development of myocardial infarction and acute cerebrovascular accident [9] ...

Numerous molecular genetic studies around the world have proven the genetic predisposition of patients to the onset and more severe course of myocardial infarction. It is known that myocardial infarction and ischemic stroke are multifactorial polygenic diseases, the predisposition to which is determined by allelic variants of genes that determine the risk of developing the disease when interacting with certain external factors [12]. In particular, in the group of patients with myocardial infarction and ischemic stroke, the analysis of genetic associations with genes of the renin-angiotensin system, genes of NO-synthases, genes encoding lipid metabolism, thrombus formation, and genes of programmed cell death was carried out. The results obtained on the contribution of various allelic variants of these genes to the development of vascular catastrophes remain controversial [3].

It has been proven that immune mechanisms play an important role in the pathogenesis of myocardial infarction and acute cerebrovascular accident, but there is no consensus among scientists regarding their influence on the course of diseases and outcomes [2]. In the early stages of myocardial infarction, the development of complications of cardiac arrhythmias is preceded by a decrease in immunity in the form of a significantly significant decrease in the level of  $\alpha$ -interferon antibodies, which correlates by the type of inverse close relationship with the heart rate [5]. However, knowledge about hemodynamic disorders that cause discirculatory phenomena in the brain, neuroreflex influences from the myocardium, changes in the physicochemical properties of blood, neurohumoral processes, metabolism and immune status do not solve the issues of etiopathogenesis and patterns of development of two vascular catastrophes.

The combination of the two pathologies leads to the development of a painless form of myocardial infarction, without its inherent symptoms (pain, shortness of breath, fear of death, drop in blood pressure). The basis of painless myocardial infarction is an increase in the threshold of pain sensitivity, impaired conduction of pain impulses and individual characteristics of pain perception [4]. A change in the clinical picture of the disease is associated with the possibility of developing an arrhythmic form of myocardial infarction in the form of attacks of supraventricular, ventricular or nodular tachycardia, atrial fibrillation, and frequent extrasystoles. In some cases, the disease begins with an acute development of intraventricular or atrioventricular blockade. The cause of bradyarrhythmia is the

presence of ischemic lesions in the vertebrobasilar system [11]. Russian scientists have proved statistically the correlation between the indicator of heart rate variability and the degree of neurological deficit [4].

Thus, in connection with the above, the aim of the study is formulated.

### **PURPOSE OF THE STUDY:**

To study the leading risk factors for the combined development of myocardial infarction and acute cerebrovascular accident.

### **MATERIAL AND RESEARCH METHODS:**

The material of the study was the clinical data of 738 patients (m-373; w-365) with acute myocardial infarction, the clinical data were obtained in 2020 at the multidisciplinary regional medical center of the Bukhara region and the Bukhara branch of the Republican Research Center of Emergency Medical Care. was  $65.3 \pm 1.36$  g. Repeated myocardial infarction was diagnosed in 170 (23.0%) patients.

The study did not include patients with cancer, anemia, thyroid dysfunction, severe renal, liver failure, alcohol abuse.

The following methods were used in the work: general clinical, instrumental (ECG, Holter ECG monitoring, ECHO-KS), biochemical, immunological. Statistical processing of the obtained data was carried out using a Microsoft Excel spreadsheet editor and the STATISTICA FOR WINDOWS V.8.0 program.

Research results. In the acute period of myocardial infarction, 185 (25%) patients were diagnosed with signs of cerebrovascular accident of varying severity. It was found that brain damage in myocardial infarction causes the appearance in 67 (36.2%) patients of general cerebral symptoms (headache, dizziness, impaired consciousness, aphasia, motor restlessness, convulsions, visual impairment) and in 28 (15.1%) patients with focal symptoms. These violations in the overwhelming majority of cases were transient. However, we found that myocardial infarction in 9.2% of cases (68 patients) is complicated by ischemic stroke, more often in the first week of the disease with a high mortality rate (72.2%) ( $p < 0.05$ ).

Ischemic stroke (IS) was established in 38 patients on admission simultaneously with the diagnosis of myocardial infarction (55.9%), in 16 patients during the first 3 days of myocardial infarction (23.5%), in 10 cases by 3-14 day of the coronary event (14.7%); 4 patients were diagnosed with stroke at autopsy (5.9%). The combination of myocardial infarction and IS was significantly more common in men (57.4%) than in women (42.6%) ( $p < 0.05$ ). The average age of the patients was  $69.7 \pm 1.92$  g.

According to the localization of cerebral infarctions, lesions prevailed in the carotid system (left middle cerebral artery (MCA) - 25 people, right MCA - 28 people), less often in the vertebrobasilar basins - 12 patients. Cardioembolic IS subtype was detected in 76% of the studied patients, lacunar stroke occurred in 10.3%, atherothrombotic subtype - in 7.3% of patients, stroke of unknown etiology - in 6.4% of patients. In 31 studied patients (m-18; g-13), the stroke was repeated (45.6%).

With a combination of myocardial infarction and ischemic stroke, Q-forming myocardial infarctions prevailed (67.6%); non-Q-forming myocardial infarction was diagnosed in 22 (32.4%) patients. The share of repeated myocardial infarction accounts for 41.2% of cases. Myocardial infarction was predominantly of the anterior and anterior septal localization (60.3%); inferior myocardial infarction was diagnosed in 26.5% of cases.

There were revealed statistically significant differences in the development of complications of myocardial infarction in combination with acute disturbance of cerebral blood supply. Pulmonary edema occurred significantly more often in patients with a combination of myocardial infarction and ischemic stroke, compared with patients who had only myocardial infarction (44.1% and 25.4%, respectively;  $p < 0.05$ ).

Acute myocardial infarction causes the development of electrical instability of the myocardium, against the background of which arrhythmias and conduction disturbances occur, contributing to the development of ischemic stroke. According to the literature, cardiac arrhythmias are found in 70–75% of stroke patients [7].

Atrial fibrillation in myocardial infarction occurs when overstrain and stretching of the atrial myocardium against the background of increased hemodynamic load on the atria with the development of acute left ventricular failure [15]. The absence of atrial systole creates conditions for thrombus formation in the left atrial appendage or in the atrium itself, increasing the risk of developing a cardioembolic subtype of ischemic stroke. With paroxysm of atrial fibrillation, the minute volume of blood flow decreases by 20–25%, which can lead to hemodynamic stroke in patients with hypokinetic type of blood circulation and severe atherosclerosis of the brain.

Our study also confirmed that the cause of acute cerebral ischemia is usually paroxysmal disturbances of central hemodynamics against the background of cardiac arrhythmias. In the group of patients with the cardioembolic subtype of ischemic stroke, the maximum number of arrhythmias was revealed: paroxysmal and permanent atrial fibrillation - 67.3% of cases, high-grade ventricular extrasystole according to Laun's classification - 53.8%, as well as episodes of ventricular tachycardia in 13.5% of patients ...

The first-line antianginal drugs used to treat myocardial infarction are nitrates. They are endothelium-independent vasodilators, the antianginal effect of which is realized by reducing myocardial oxygen demand and improving myocardial perfusion. It is known that the appointment of this group of drugs is not desirable in the acute period of ischemic stroke due to increased cerebral ischemia.

The drugs of choice for the treatment of myocardial infarction when combined with ischemic stroke are beta-blockers. The anti-ischemic effect of this group of drugs is due to a decrease in myocardial oxygen demand, due to a decrease in heart rate (HR) and heart rate. Beta-blockers simultaneously improve myocardial perfusion by decreasing the end-diastolic pressure in the left ventricle (LV) and increasing the pressure gradient that determines coronary perfusion during diastole, the duration of which increases as a result of a decrease in the heart rate [10]. A change in the clinical picture of the disease is associated with the possibility of developing an arrhythmic form of myocardial infarction in the form of attacks of supraventricular, ventricular or nodular tachycardia, atrial fibrillation, and frequent extrasystoles. Consequently, this category of patients requires the mandatory appointment of beta-blockers, in the absence of contraindications.

Patients with myocardial infarction must be prescribed antiplatelet agents and anticoagulants in the early stages. However, early anticoagulant therapy for ischemic stroke remains a subject of discussion, since there is a risk of hemorrhagic complications and the development of hemorrhagic stroke. According to a number of studies, with early anticoagulation with heparin, cerebral hematoma developed in 1.5% of patients, and large extracerebral bleeding - in 3.7% [6]. Therefore, in each specific case, when prescribing anticoagulants to patients with myocardial infarction in combination with ischemic stroke, it is necessary to individually select the dose of the drug, to assess the benefits and potential risk of hemorrhagic complications.

Thus, the presence of a complex symptom complex when examining patients requires the doctor to be alert and conduct a targeted search for a combination of myocardial infarction and acute cerebrovascular accident. The low efficiency of treatment when using standard drug therapy contributes to the search for new alternative approaches to the treatment of combined pathology. Timely recognition of cases of a combination of myocardial infarction and acute cerebrovascular accident is extremely important, since late diagnosis leads to errors in the tactics of specialized hospitalization and lengthens the time frame for the provision of specialized medical care.

### CONCLUSIONS:

1. The leading risk factors for the combined development of myocardial infarction and ischemic stroke are male sex, age over 70 years, previous acute cerebrovascular accidents, postinfarction atherosclerosis, the first day of Q-forming myocardial infarction of the anterior wall of the left ventricle of the heart.
2. Given the high mortality rate (72.2%) of patients with a combination of two vascular accidents, further study of the etiology and pathogenesis of myocardial infarction and acute cerebrovascular accident is necessary with the development of algorithms for individual preclinical prediction.
3. Myocardial infarction and ischemic stroke are clinical manifestations of a single pathophysiological process, which includes a cascade of hemodynamic and hemostatic changes, requiring the appointment of modern complex pharmacotherapy in the conditions of regional vascular centers and primary vascular departments.

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