IMPACT OF PAST CORONAVIRUS INFECTION COVID 19 ON THE SEVERITY OF CORONARY HEART DISEASE

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INTRODUCTION: Coronary heart disease (CHD) is one of the leading causes of death in the world. The gold standard for the treatment of coronary artery disease in acute coronary vascular patency disorders is myocardial revascularization by stent placement, balloon angioplasty, or coronary artery bypass grafting. Achievements in the field of myocardial revascularization, the active introduction of drug-coated stents and effective antithrombotic therapy have led to the fact that coronary vascular restenosis has become a rare phenomenon in recent years. The clinical symptoms of CHD are directly related to the degree of narrowing of the internal lumen of the coronary arteries by atherosclerotic plaques. One of the possible options for eliminating this narrowing is percutaneous coronary intervention with stent implantation. However, in 2-3 % of cases, over a relatively short period of time, a repeated narrowing of the lumen of the artery, or restenosis, develops in the area of the stented segment of the coronary artery. This occurs mainly due to excessive growth of the inner lining of the artery wall, the so-called neoitima. This leads to the return of the angina clinic. At the same time, the resulting repeated narrowing of the artery lumen (restenosis) is often clinically much more significant than the atherosclerotic plaque, for which stenting was performed. [1]. The invention relates to medicine, namely cardiology, and can be used to predict the degree of risk of restenosis in the coronary stent. There is a known method for predicting the development of restenosis based on clinical or anatomical indicators (1-Hirshfeld J. W. Jr. et al., 1991). This method is considered an analog. The role of the inflammatory process in the pathogenesis of CHD consists in the simultaneous provocation of endothelial dysfunction with the development of a local imuninflammatory

reaction [3]. In comparison with previous years, the incidence and mortality from CHD increased, which may be due to the pandemic of a new type of coronavirus COVID 19 (CVI). 11 On March 11 2020 , 2020 , WHO announced the beginning of a pandemic, and on March 13, 2020, the first case of the disease was detected in the Republic of Kazakhstan [4].

Thus, one in 14 people has suffered a coronavirus infection, which in turn leads to a worsening of the course of chronic diseases, especially circulatory diseases. Not from the first days, but still the pathogenesis of the new infection was described. The negative impact of CVI on the vascular endothelium was доказано already proven by the end of 2020. It consisted in diffuse vascular damage to the entire body, which was expressed in the development of sequential processes, diffuse imuninflammatory and thromboinflammatory syndromes [5]. It was soon discovered that the in-hospital mortality rate of patients with ST-elevation myocardial infarction increased during the CVI pandemic [6]. It was also found that the combination of heart failure and CHD has a significant adverse effect on the risk of mortality in hospitalized patients with CVI [7]. A new study has shown that hospitalized patients with COVID-19 in the United States have a high prevalence of myocardial damage, which was associated with lower survival and worse outcomes [7]. The real revelation was the 2022 study by scientists from Washington. It turned out that the risk of developing CHD after undergoing CVI increased by 72%, and the frequency of heart attacks was 63% higher. However, in all cases, the risk

increased even in patients younger than 65 years without chronic diseases [12].

The results of studies indicate that the risk of developing cardiovascular diseases within 1 year in patients with a favorable outcome after undergoing CVI is significant. [9] In addition, potentially fatal complications of CHD, such as CS after a previous CVI , come на первый to the fore, and according to some data [10] can be considered as a clinical picture of severe CVI. It is obvious that the analysis of the relationship between the past COVID-19 and the exacerbation of cardiovascular diseases can confirm the role of inflammation in the development of atherosclerosis and its complications, and also help in creating new tools for predicting risk.

MATERIAL AND METHODS: In this cross-sectional, retrospective, observational study, the aim was to study the effect of CVI on the course of CHD and the risk of acute myocardial infarction. Задачи Research objectives:
• To study the existing literature data on the role of inflammation in the course of CHD and CHF; To analyze the maps of patients with CHD and make a selection according to the inclusion criteria; To conduct a comparative analysis of the data of the study and control groups according критериям to the inclusion criteria;
• To identify the relationship between a history of COVID-19 coronavirus infection and the course of coronary heart disease.
We studied the medical records of inpatient patients treated in the period from March 2020 2020 to December 2022 years on the basis of the Department of X-ray endovascular surgery of the AGMI in Andijan. The total размер sample size was 28 patients. For comparison, two groups of patients with ischemic heart disease were taken: with a history of CVI in the number of 16 people (group I) and without it - in the number of 12 people (group II). The average age of group I was 55,6,3±7,87 years, Group II 55,5,8±9,36 years.
Критерии The inclusion criteria were as follows:
• Patients with ischemic heart disease of the type of tension angina of functional class (FC) II-III;
• Age over 35-years.
• The presence of chronic heart failure (CHF) FC II-III according to the classification of the New York Heart Association (NYHA);
• Performing coronary angiography (CAG);
• Favorable outcome of treatment. Критерии The exclusion criteria were as follows:
• Pregnant women; Children; Patients with organic heart valve lesions; Patients with other

заболеваниями heart diseases in the absence of CHD; Patients with end -stage CHF (IV NYHA FC IV); Летальные Deaths.
After determining the inclusion and exclusion criteria, the following qualitative and quantitative features were formed:
• The degree of occlusion according to CAG data of the following coronary arteries: right coronary artery (RCA), circumflex artery (OA), anterior interventricular branch (AVV);
• The result теста of the six -minute walk test (6MX test).
• Lipid spectrum – data on cholesterol (cholesterol), triglycerides (TG), low-density lipoproteins (LDL), and high-density lipoproteins (HDL).
• Risk of developing acute myocardial infarction (AMI);
• Left ventricular ejection fraction (LVEF) according to echo cardiography (EchoCG);
Based on the studied features, a database was formed and further statistical processing of the values was performed. For statistical purposes
For the analysis, qualitative variables were expressed in specific numbers and percentages, while quantitative variables were expressed as averages ± standard error of the arithmetic mean. To determine the relationship between quantitative variables, the Student's parametric t-test was used. To determine the relationship between qualitative variables, the Pearson chi-square test was used. The differences were considered statistically significant at $p < 0.05$

RESULTS: The study included 28 patients, 16 in group I and 12 in group II. The results of processing quantitative signs are presented in Table 1, where N is the number of patients, M is the arithmetic mean, me is the median, m is the standard error of the arithmetic mean, t is the Student's criterion value, and p is the degree of confidence. Quantitative signs included the results of LVEF, 6MX test, lipidogram values and the degree of stenosis according результатам to CAG results.

DISCUSSION: According to numerous studies conducted in recent years, not only dyslipidemia, but also systemic inflammatory response, as
a factor in the formation of atherosclerotic plaques, plays a significant role in the development of CHD. At the same time, CVI, which has a pathogenetic effect in the form of systemic immune - inflammatory and thrombo-inflammatory reactions, plays a leading role in worsening the course of cardiovascular diseases due to damage to the vascular endothelium of the

entire body.

Table 1.

Category	I Group				II group				t	p
	N	M	me	m	N	M	me	m		
EF%	51	53,3	57,5	1,52	55	59,96	61	1,68	2,94	0,004
6MX	47	280,2	270	9,16	54	311,4	300	11,45	2,13	0,035
PERMANENT RESIDENCE	27	75,93	80	3,64	37	60,54	70	3,4	3,09	0,003
OA	15	65,33	70	4,72	19	62,89	60	5,17	0,35	0,729
PKA	24	73,13	75	3,37	23	64,35	70	4,55	1,55	0,128

The hypothesis on which we relied was the expected deterioration of the course of CHD in patients who underwent CVI, even in mild and moderate form. Of the 18 patients in Group I, 8 (45%) patients reported an increase in clinical symptoms after the disease, which partially confirmed our hypothesis before reviewing the results. But in order to be completely convinced of the truth of the assumption, it is necessary to consider the results according to the criteria approved before the study began. The initial objective of the study was to find out how CVI in the anamnesis affects the course of coronary heart disease, so the first indicator we considered was the degree of coronary vessel occlusion. We selected indicators of occlusion of three main vessels: permanent residence, OA, and PKA. The greatest statistically significant difference is noted in the study of the degree of patency of permanent residence according данным to CAG data. So , for patients I of group I, the average value of the degree of stenosis was 75.93±3.64%, while for group II, 60.94±3.4%(p=0.003). Indicators of the degree of stenosis of other arteries also tend to have a more pronounced stenosis in patients of group I. So for the degree of OA stenosis, for groups I and II, the indicators were 65.33±4.72% and 64.35±4.55, respectively (p=0.001001). The value of PKA stenosis in group I was 73.13±3.37%, group II-64.35±4.55% (p=0.128). Based on the above, CVI is one of the determining factors of the degree of ischemic myocardial damage.

Table 2.
Blood serum lipid content in practically healthy CHD patients

Groups	Total CHOLESTEROL, mmol / l	Triglycerides, mmol / L	LDL, mmol/L	HDL, mmol/L	VLDL, mmol/L	Atherogen index. ed
I group I	4,6±0,1	1,5±0,1	2,6±0,2	1,4±0,1	0,4±0,1	2,8±0,3
II Group II	6,8±0,3	2,6±0,1	5,2±0,3	0,9±0,4	0,7±0,3	5,2±0,2
P 1-2	P<0.001	P<0.05	P<0.001	P<0.05	P<0.05	P<0.01

The clinical lipidogram values shown in Diagram 1, tended to be better in Group I patients, with the exception of the LDL index. For this group, the index was 3.01±0.22 mmol/l, for group II, 2.90±0.14 mmol/l. HDL in patients of group I averaged 1.1±0.04 mmol/l, in patients of group II, 1.03±1.0 mmol/l. Since this fraction of lipids is anti-atherogenic, a higher value in the CVI group indicates a tendency to a better lipidogram value. CH in patients was 4.48±0.24 mmol / l and 4.56±0.16 mmol/L for groups I and II группы, respectively. TG так also corresponded to the general trend towards a lower value in group I. For group I, the average value was 1.62±0.14 mmol/l, in patients of group II, 1.89±0.14 mmol/l. In connection with the data obtained, it can be noted that not only dyslipidemia affects the formation of atherosclerotic plaques, but also the state of vascular endothelium, which changes with systemic inflammatory reactions. Since при CVI is characterized by immuno-inflammatory and thrombo-inflammatory syndrome, vascular endothelial damage is an expected consequence of CVI, even with a favorable outcome, which leads to an increased risk of a more severe course of coronary heart disease. In addition, in patients of group I, the clinical course of CHD expressed in the results of the 6MX test significantly differed from patients of group II. The results shown in Diagram 3 clearly show the difference between this indicator between the 2 groups. So , for patients of group I, the value of the 6MX test was 208.2±9.1 m, and for patients of group II,

311.4±1.45 m, respectively (p=0.001). Thus, the initial hypothesis that CVI in the anamnesis is a factor of more severe CHD was confirmed in this study. Taking into account that all patients had

NYHA FC II - III CHF, the LVEF index was also analyzed according to the results of echocardiography.
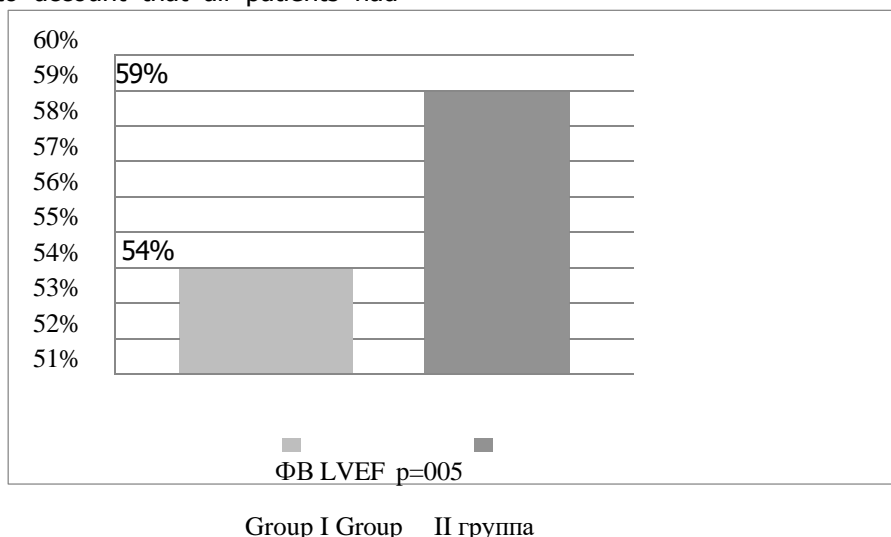
Figure 1 - Данные ЭхоКГ ФВ Simpsons LVEF echocardiography data по Симпсону

A graphical representation can be seen in Figure 1. For the first group, LVEF was 53.3±1.52%, and for the second group ФВ, LVEF was 59.96±1.68% (p=0.001). Based on the полученных data obtained, it can сделать be concluded о том, that the previous CVI significantly affects the contractility of the myocardium, which makes the general condition of patients more difficult and negatively affects the quality of life of patients. In addition, you should pay attention to the quality indicators presented in figure. An important factor is that in patients in I group I , the primary incidence of CHD was observed in 18 cases (31.3%), в то while как for group II only in 8 patients (14.5%). CHD in group I developed in 9 cases (17.6%), y in patients II of group II in 6 cases (10.9%). RR=1.618 CI 95% (0.619-4.226), ОШ= OR= 1.750 CI 95% (0.575-5.322) (p= 0.321). It follows that a history of CVI affects not only the course of existing coronary heart disease, but also increases the risk of this disease in patients who previously had no coronary symptoms. It also increases the risk of potentially fatal complications, including the AMI we considered. Based on the above, the initial hypothesis proposed by us was confirmed on the basis of the conducted research. Unfortunately, given that the study was conducted retrospectively on the basis of the Department of X-ray endovascular surgery, it is impossible to accurately assess the dynamics of patients condition in the period from two to four months after discharge. In the future, this study can be expanded by involving специалистов

outpatient specialists to monitor the dynamics of the course of the disease and the condition of patients after CAG with stenting.

CONCLUSIONS: Coronavirus infection COVID-19 affects the course of CHD and CHF due to the development of a systemic inflammatory reaction, which leads to a worsening of the overall course of the disease. Hyperinflammatory procoagulation and endothelial dysfunction are important elements of the pathogenesis of coronavirus infection, which increase the risk of thrombosis. Of course, thrombotic / thromboembolic complications associated with COVID-19 are associated with a more severe course of the disease. Special attention should be paid to monitoring, preventing and treating thrombotic and thromboembolic complications of coronavirus infection, regardless of its severity, and not only in hospitalized patients.Coronavirus infection with COVID-19 increases the trend towards the risk of CHD OR=1.618 CI 95%. Coronavirus infection COVID-19 affects the primary incidence of coronary heart disease in patients for whom coronary symptoms were not previously characteristic. In I group I , the primary incidence of CHD was в 18 случаях 31.3% in 18 cases в то , while как in group II, only 8 patients had 14.5%. Coronavirus infection COVID-19 significantly reduces the contractile function of the myocardiuma. Coronavirus infection COVID-19 affects the aggravation of CHD symptoms, expressed in the 6 MX test. Given the relatively better lipidogram results in Group I patients, it can be argued that

the systemic inflammatory response plays a key role in the formation of atherosclerotic plaques.

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