ANALYSIS OF DISEASES ACCOMPANYING MYOCARDIAL INFARCTION

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Relevance. COVID-19 infection has become a major concern for the medical community. Various studies have shown that COVID-19 disruptions in the immune system, increased metabolic demand, and procoagulant activity caused by coronavirus can lead to adverse outcomes in the population with cardiovascular diseases [1, 2, 3,4].

In patients with COVID-19, the virus can lead to myocardial damage, endothelial dysfunction, increased thromboembolic syndrome, chronic heart failure, impaired cardiac function, sudden coronary death, progression of arterial hypertension, and progressive atherosclerosis [4,5]. One of the complications of cardiovascular diseases is heart failure. There are a number of scientific and practical studies dedicated to the pathogenetic processes of heart failure, which open up new possibilities for understanding the nature of heart failure [6.7].

Analysis of neurohumoral markers is of significant prognostic significance in heart failure. The study of the neuroimmunoendocrine status of the adult population in combination with the clinical course of heart failure is highly relevant. A study by Chinese scientists found that COVID-19 was the cause of heart failure in 23% of 191 patients hospitalized in Wuhan City Hospital [7.8]. Several cases of severe myocarditis with reduced systolic function were also noted after coronavirus infection. It has been proven that out of 150 COVID-19 patients, 7 percent of 68 deaths were associated with myocarditis and heart failure.

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Objects and methods of verification

Our research was conducted at the Namangan Regional Branch of the Republican Center for Emergency Medical and Scientific-Practical Cardiology. Based on a retrospective analysis, the scientific study involved 304 patients hospitalized with a diagnosis of myocardial infarction before and during the pandemic. Of these, 139 patients were patients with myocardial infarction in the pre-pandemic period, and 165 were patients with myocardial

infarction during the pandemic period. Of the 165 patients, 61 had myocardial infarction (MI) and COVID-19, while 104 had only MI. Of the 139 patients, 86 (62%) were male and 63 (38%) were female. Of the 165 patients with MI registered in the context of the pandemic, 98 (68%) were men and 67 (32%) were women. Of the patients, 203 (49.7%) were transported to the hospital by ambulance, while 101 (33%) were transported by their own vehicle. The average age of the patients examined ranged from 48 to 75 years. The diagnosis of myocardial infarction was made in accordance with the recommendations of the European Society of Cardiologists in 2018. Retrospective studies covered the period before the pandemic, that is, from December 2018 to December 2019, while the study conducted during the pandemic covered the period from January 2020 to January 2022. Special maps were created for the patients involved in the study. The card included the following indicators: passport part, complaint, medical history, duration of the illness, comorbidities, laboratory and instrumental studies. Comorbidities encountered in patients were thoroughly analyzed. The data obtained during the study was statistically processed on a Pentium IV personal computer using the Microsoft Office Excel - 2013 software package, including the use of internal statistical processing functions, as well as the use of the STATISTICA-6.0 software package.

Analysis of the results obtained

According to the data presented in the table, in the pre-pandemic period, hypertension was observed in 73% of patients with MI, which indicates that hypertension, according to the literature data, occupies a leading position in the development of MI (Table 1).

Table 1.

Analysis of comorbidities in patients with myocardial infarction (general group, interperiod analysis)

№	Indicators under study	Pre-pandemic N=139		In a pandemic (common group) N=165	
		n	%	n	%
1	AF	32	16,0	51	30,9****
2	COPD	21	15,0	33	20,0****
3	AG	101	73,0	135	82,0****
4	RI	2	1,4	7	4,2***
5	DM	29	21,0	41	25,0
6	MT	3	2,2	9	5,4***
7	CHF (2-3 FK)	41	29,5	62	37,6***

Appendix: ***$p<0.001$; ****$p<0.0000$ significant intergroup indicator, AF - atrial fibrillation, AG - arterial hypertension, RI - renal insufficiency, DM - diabetes mellitus, MT - malignant tumor, CHF - chronic heart failure, COPD - chronic obstructive pulmonary disease

At the same time, regardless of the stages of heart failure and functional class, the incidence of MI is not insignificant, and in our results, hypertension with 29.5% also occupies the next place. Diabetes mellitus was no exception, as you can see, this disease ranks next with diabetes mellitus with 29%. Among the patients examined during the pandemic, hypertension was the leading cause in 82% of cases, followed by bronchial asthma (30.9%). We observed that the pre-pandemic attitude towards the remaining comorbidities persisted, but we observed significant differences in values.

According to the data received, the frequency of atrial fibrillation in patients with myocardial infarction significantly increased by 59.4% (p<0.0000) during the pandemic compared to the pre-pandemic period. Significant differences were also observed in the registration of hypertension, with cases of hypertension significantly increasing by 34% (p<0.0000) during the pandemic compared to the pre-pandemic period. Heart failure, accompanied by myocardial infarction, increased by 51% during the pandemic and differed significantly (p<0.001) from the pre-pandemic period. Significant differences were also observed in COPD and diabetes. The incidence of both diseases in the pre-pandemic period was low compared to the pandemic period: 21% diabetes and 15% COPD. However, during the pandemic, the registration rate of diseases was high, i.e., 25.0% and 20%. At the same time, RI increased by 28.6% (p<0.001) in patients with myocardial infarction during the pandemic.   Next, we analyzed comorbidities in patients with myocardial infarction and viral infection in the context of the pandemic. As mentioned above, a total of 165 patients were admitted to the hospital in the context of the pandemic, of whom 61 were patients with MI + V and 104 were only patients with MI. Patients with MI + V can be classified as a high-risk group, as evidenced by studies conducted in a number of European and Chinese countries. Therefore, we analyzed the role of comorbidities in the development of its complications in this group of patients (Table 2).

Table 2.

Analysis of comorbidities in patients with myocardial infarction and viral infection (during the pandemic)

№	Ўрганилаётган кўрсатгичлар	МИ+ В N=61		МИ N=104	
		n	%	n	%
1	AF	31	16,0***	20	30,9
2	COPD	19	15,0***	14	20,0
3	AG	81	73,0***	54	82,0
4	RI	5	1,4	2	4,2
5	DM	27	21,0**	14	25,0
6	MT	5	2,2	4	5,4
7	CHF (2-3 FK)	39	29,5***	23	37,6

Appendix: **p<0.01; ***p<0.001 significant intergroup indicator, AF - atrial fibrillation, AG - arterial hypertension, RI - renal insufficiency, DM - diabetes mellitus, MT - malignant tumor, CHF - chronic heart failure, COPD - chronic obstructive pulmonary disease

According to the data presented in the table, BP in the MI +V group was 25% (p<0.001) higher than in the MI group, COPD was 36% (p<0.001), hypertension was 50% (p<0.001), diabetes was 52% (p<0.01), and heart failure was 59% (p<0.001) higher.   The data shows that among patients admitted to the hospital with a diagnosis of MI before the pandemic, cardiogenic shock was the leading cause of complications in 11.5%, followed by pulmonary edema (9.3%) and mortality rate (5.7%). During the pandemic, it was also characterized by high frequency (17%), while the same values were observed for mortality rate and pulmonary edema (11%, 11%). Intergroup analysis of complications caused by myocardial infarction also has its own characteristics. The pre-pandemic period was characterized by a 9.3% increase in pulmonary edema, a 57% increase in cardiogenic shock

(p<0.001), and a 42% increase in pulmonary edema (p<0.001) compared to the pandemic period.

The data obtained indicates that patients in the MI+V group are classified as high-risk, as you can see, because the frequency of pulmonary edema , cardiogenic shock and mortality rate was confirmed to be quite high in patients with MI+V.

Conclusion. In the period before and after the pandemic, we witnessed a high percentage of myocardial infarction accompanied by arterial hypertension, followed by diabetes mellitus and chronic obstructive pulmonary syndrome. As for complications caused by myocardial infarction, the most common complication during the pandemic period was cardiogenic shock, while during the pandemic it was pulmonary edema and mortality.

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