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Condition of Coronary Arteries and Change of Lipid Profile in Coronary Heart Disease

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ABSTRACT: This article analyzes the features of the course of coronary heart disease in patients with coronaryartery disease and metabolic disorders, in particular lipid profile. The study included 75 patients with damage totwo or more coronary arteries according to a coronary angiographic study who were hospitalized at theDepartment of Medical and Surgical Medicine during 2019-2020. It was found that a lowered level of highdensity lipoproteins is an unfavorable factor for re-hospitalization in patients with coronary artery disease.

KEYWORDS: coronary heart disease, coronary intervention, lipoproteins, cholesterol.

I.INTRODUCTION

A third of the world's inhabitants die from coronary heart disease (CHD). Annually, coronary heart disease killsabout 1.8 million European lives (according to the large -scale EuroHeartII project, implemented in 2011-2014)[1]. Uzbekistan is also a member of the European Association of Cardiology and according to RSCC, 59% ofpatients account for coronary heart disease from all hospitalized to the hospital [1].Coronary artery disease is a powerful factor in the poor prognosis in patients with coronary artery disease,associated with ischemia, the development of myocardial infarction (MI), repeated myocardial infarction, andultimately ending with complex cardiac arrhythmias and the terminal stage of heart failure [2,3]. Often, changesin the coronary bed are detected ―by accident‖ in relatively stable patients who did not tolerate MI, with highexercise tolerance. Correction of coronary artery disease involves percutaneous coronary intervention (PCI)mainly in the left coronary artery (LCA) [4], and then the appointment of two -component antiplatelet therapy[5], correction of heart failure. But there is also a connection between an uncorrected lipid metabolism disorder,the state of enzymes, and hence the prognosis in patients with coronary artery disease [1,6].

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II.PURPOSE OF THE STUDY

Study of the course of coronary heart disease in patients depending on the damage to the coronary arteries andthe level of lipid profile.

III. MATERIALS AND METHODS

A retrospective study was performed in 75 patients with damage to two or more coronary arteries according tothe coronary angiographic study, who were hospitalized in the Department of Infectious Diseases in the courseof 2019-2020.According to a 12-month follow-up, depending on the outcomes, the patients were divided into two groups:group 1 — a group of favorable outcomes and group 2 — adverse outcomes, 3 months after the start of thestudy, with further monitoring during the year. The concept of an ―unfavorable outcome‖ included thedevelopment of one of the following events: a fatal outcome, repeated MI (non-fatal), progression of coronaryinsufficiency, development and progression of chronic heart failure (CHF) (according to the ShOKS modifiedby V.Yu. Mareev, 2016) [8], repeated hospitalizations. Group 1 with a favorable course included 41 patients,and group 2 with adverse outcomes included 34 patients. The lipid spectrum was studied, in particular, the levelof total cholesterol, triglycerides, lipoproteins of high, low and very low density, as well as the atherogeniccoefficient, indicators of biochemical analyzes: alanine aminotransferase (ALT) and aspartate aminotransferase(AST), bilirubin, urea, creatinine.

IV. RESULTS

The average age of patients in groups 1 and 2 was 62.7 ± 3.09 and 63.4 ± 3.97 years, respectively (p <0.02).Note the predominance of males in both groups: 24 (58.5%) in the first and 21 (61.8%) in the second group (P<0.002). BMI of 29.5 ± 3.5 and 30.4 ± 3.2 in groups 1 and 2, respectively. ACS during hospitalization wasdiagnosed in 15 (36.6%) and 16 (47%) (p <0.05) patients, respectively. In group 2, significa nt differences wererecorded in relation to diseases such as acute coronary syndrome, hypertension, diabetes mellitus, signs of heartfailure and threatening cardiac arrhythmias during hospitalization - atrial fibrillation (AF), paroxysmaltachycardia (PT), extrasystole, atrioventricular block I and II degrees.

Table 1

General information

Parameters	1 group (favorable outcomes) n = 41	Group 2 (adverse outcomes) n = 34
Age	62,7 ±3,09	63,4±3,97
Sex	m-24 (58.5%) f-17(41.5%)	m-21(61.8%) f-13(38.2%)
Height cm	168,4±5.2	166,5±5.08
Weight, kg	86,7±10.5	89,3±10.4
BMI kg / m²	29,5±3.5	30,4±3.2
ACS during hospitalization	15 (36.6%)	16 (47%)

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Stable angina during hospitalization	26 (63.4%)	18 (53%)
Signs of heart failure during hospitalization	28(68.3%)	25 (73.5%)
Hypertonic disease	35 (85.4%)	28(82.3%)
Diabetes	18(44%)	17(50%)
Rhythm disturbances (AF, extrasystole, PT)	8(19.5%)	9 (26.5%)
AV blockade I-II degrees	14(34.1%)	15(44.1%)
History of anemia	25(61%)	26(76.5%)
History of stroke	5(12.2%)	6(17.6%)
Chronic kidney disease during hospitalization	4(9.7%)	4(11.8%)

Note: Differences are statistically significant at P <0.05.

Table 2

Laboratory data

Parameters	1 group (favorable outcomes) n = 41	Group 2 (adverse outcomes) n = 34
Hemoglobin g / l	95,8±12,5	92,4±13,2
ESR mm / h	13,6±7,3	16,4± 9,6
Leukocyte 10^{*9} / l	6,8±0,8	8,02±2,4
Thrombocytes10^{*9} / l	231,5±63,8	236±28

Note: Differences are statistically significant at P <0.05.

Table 3

Biochemical data

Parameters	1 group (favorable outcomes) n = 41	Group 2 (adverse outcomes) n = 34
Cholesterol mg / dl	204,9± 43,9	220,7 ± 59,1
LDL mg / dl	131,7± 33,6	145,2± 48,9
VLDL mg / dl	6,37±14,3	42,1± 22,3
HDL mg / dl	36,7±6,5	33,6± 5,3
TG mg / dl	182±72,2	210,8±111,3
Atherogenic Index> 3	4,71±1,1	5,2±1,3
ALT U / I	28,8±12,1	39,4± 20,7
AST U / I	30,5±16,2	36,7±20,6

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Bilirubin mmol / L	16,2± 6,5	13,6±3,3
Urea mmol / L	7,4±1,9	7,8±1,9
Creatinine mmol / L	95,7±16,3	101,7±19,3
Blood Sugar mmol / L	6,73 ±2,12	6,9 ±2,2
Glycated Hb	8,8±2,4	8,95 ± 2,4
PTI	66,9± 29,2	64,6 ± 31,8
INR	6,27± 9,5	17,6±26,8
Fibrinogen g / l	3,1± 0,7	3,6±1,2

Note: Differences are statistically significant at P <0.05.

The differences in laboratory parameters are generally quite predictable in both groups and confirm the known data on the cardioprotective function of high density lipoproteins and the negative effect of an increase in the atherogenic index on the course of IHD. Noteworthy is the increased level of ALT in the group with adverse outcomes (39.4 ± 20.7 to 28.8 ± 12.1, respectively).

To clarify the value of dyslipidemia, all patients were divided into groups: HDL <40 mg / dL and HDL> 40 mg / dL, as well as LDL <100 mg / dL and LDL> 100 mg / dL

Table 4

Outcomes in Dyslipidemia Groups

Outcomes	HDL> 40 mg / dl n = 28	HDL<40 mg / dl n = 47	LDL <100 mg / dl n = 29	LDL> 100 mg / dl n = 48
Angina progression	2(7.14%)	7 (14.9%)	4(13.8%)	9(18.75%)
CHF progression	1(3.6%)	8(17.02%)	3(10.3%)	8(16.7%)
Rehospitalizations	3(10.7%)	6(12.8%)	4(13.8%)	7(14.6%)
MI development	0(0%)	1(2.12%)	0(0%)	2(4.2%)
Re-MI Development	0(0%)	3(6.4%)	1(3.45%)	3(6.25%)
Favorable	14(50%)	18(38.3%)	15(51.7%)	17(35.4%)
Fatal	0(0%)	3(6.4%)	0(0%)	3(6.25%)

Note: Differences are statistically significant at P <0.05.

Due to the fact that the sample involved patients who underwent percutaneous coronary intervention from April2019 to March 2020, it was not possible to involve the entire cohort in the calculation of outcomes for 12months. Therefore, a part of patients was excluded for whom, at the time of data

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processing, they were less than12 months from the date of initial registration. For this reason, the patient sample turned out to be small anduneven, which did not allow us to record the reliability of the results. However, I would like to emphasize thatall 3 observed repeated myocardial infarction and deaths were in groups with dyslipidemia (HDL <40 mg / dLand LDL> 100 mg / dL).As for laboratory indicators, a direct correlation between the levels of lipoproteins of high, low density and totalcholesterol, as well as an atherogenic index, is recorded here.In addition, I would like to note a significant decrease in patient adherence to therapy, especially the use ofstatins, during the year. Moreover, in the group with favorable outcomes, this negative tendency is expressedeven more than in the group with unfavorable outcomes.

V. DISCUSSION

A close feedback between the level of HDL cholesterol and the risk of developing coronary heart disease wasobtained and confirmed. According to the results of three large epidemiological studies (Framingam, LRSPrevention Mortality-Followup Study, MRFIT), it was concluded that an increase in HDL cholesterol by 1 mg /dL (0.026 mmol / L) is associated with a 1.9— lower risk of cardiovascular disease 2.9%. [9]. According to ourdata, differences in laboratory parameters are generally quite predictable in both groups and confirm previouslyknown data on the cardioprotective function of high density lipoproteins [10] and the negative effect ofincreased atherogenicity on the course of IHD. There is a direct relationship between the level of HDL and CFS,especially triglycerides and LDL. Noteworthy are liver enzymes, in particular, an increased level of ALT in thegroup with adverse outcomes, as well as a direct correlation of the level of AST and low-density lipoproteins.We also recall that an increase in AST in the blood, in addition to liver damage, is also observed in the case ofmyocardial infarction (Ritis index - the coefficient value of which is normally 1.33 ± 0.42 or 0.91-1.75) [9],angina pectoris and heart failure. At the same time, the prescribed therapy and adherence to it (especially tostatins) did not differ significantly between the groups. In this regard, the l ikelihood of the effect of taking highdoses of statins on an increase in the level of enzymes is also very small. Therefore, the possibility ofconsidering AST as an adverse factor in patients with coronary artery disease is not ruled out. There was also ahigh inverse correlation between HDL levels and blood sugar levels, especially glycated hemoglobin.

VI. CONCLUSIONS

1. The lowered level of high density lipoproteins is a factor of frequent hospitalizations and furtherconsideration of the issue of repeated coronary angiography.

2. The possibility of considering AST as an adverse factor in patients with coronary artery disease is not ruledout.

CONFLICT OF INTEREST

Authors have no potential conflict of interest to declare.

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