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DYSLIPIDEMIA AS AN ADVERSE RISK FACTOR FOR CORONARY HEART DISEASE IN YOUNG MEN

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Abstract:

The clinical status of patients with coronary heart disease (CHD) and its relationship with atherogenic and anti-atherogenic lipoproteins was studied. We examined 230 patients with CHD aged 18 to 74 years (mean age 52.0±5.0 years). All the patients underwent history taking, anthropometry, general clinical, laboratory, biochemical (lipid spectrum) and instrumental studies. Obtained lipid profile analyses in patients with IHD showed that LDL in the 1st and 2nd groups were almost equally elevated compared to the control group.

Keywords: CHD, young age, old age, lipoproteins

INTRODUCTION. In the pathogenesis of coronary heart disease (CHD), dyslipidemia (DLp) is considered to be the most important prognostic risk factor, in which an imbalance between atherogenic and non-atherogenic lipoproteins and blood lipid/lipoprotein concentrations are out of normal range is observed [1, 2, 4, 16]. Asymptomatic atherosclerotic changes in the coronary arteries (CA) associated with LDL are already detected at a young age and progress steadily over decades, even in middle age the frequency of detection of atherosclerotic changes in the CA approaches 100% before they lead to the development of clinical manifestations of CVD [3, 5, 8, 17]. Nowadays there is a lot of evidence that high levels of LDL, increased number of small LDL particles, very low density lipoprotein (VLDL) and low levels of high density lipoprotein (HDL) are three main high risk lipoproteins for CA atherosclerosis and complications associated with them [6, 9, 10, 12].

For many years great attention is paid to the study, early detection and correction of elevated levels of total cholesterol (TC) and low-density lipoprotein (LDL), as they are atherogenic lipoproteins [2, 14, 15] and with a 10% decrease in plasma concentrations of OCS contributes to a 25% reduction in the incidence of CHD in 5 years, and with a decrease in LDL by 1 mmol/L is accompanied by a 20% reduction in cardiovascular disease (CVD) [5, 11, 13]. Among the 7 leading FRs, elevated levels of CHD make a major contribution to the development of premature death in the population and account for 23%. Every fifth man has a decreased HDL level, every third man has hypertriglyceridemia [6]. A sufficient number of studies have documented a high prevalence of lipid abnormalities in young individuals with CHD compared with the older age group [19, 22].

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Lower levels of HDL and higher levels of triglycerides (TG) were observed among young patients with CHD, which once again states that LDL in young adults is one of the important FRs in the development of CHD [16, 18, 28]. In VLDL, smooth myocytes may be able to capture modified LDL and turn into foamy cells [15, 17, 24]. It has been noted that obese patients (BMI 30 kg/m2 or more) often develop atherogenic LDL [20, 25, 27] and the blood concentration of TG increases and HDL level decreases, in parallel, the release of free fatty acids from adipocytes into the bloodstream increases, which is accompanied by an increase in hepatic synthesis of LDL [3, 20, 21, 26]. In this process, low activity of peripheral lipoprotein lipase is observed, which is unable to fully break down TG-rich particles [19, 22, 23].

The development of early diagnostic methods, prevention and pathogenetic adequate correction of atherogenic LDL is considered to be one of the urgent problems of modern cardiology. The study of the problems associated with subclinical atherosclerosis is considered important because the detection and treatment of DLD in the early stages of the pathological process, can be potentially reversible or significantly slow its progression. In this connection, the development of optimal diagnostic and therapeutic algorithms will help to effectively solve the problems associated with the atherosclerotic process.

OBJECTIVE: to study the role of dyslipidemia risk factor in the development of coronary heart disease in young men.

MATERIAL OF THE STUDY. The objects of the study were 230 patients with coronary heart disease hospitalized in the departments of somatic intensive care, emergency therapy №1 and 2 of Samarkand branch of RRCEMP during the period of 2020-2022. The patients were divided into 2 groups depending on their age. The 1st group included 126 patients of young age (18-44 years old). Group 2 included 104 elderly patients (60 to 74 years old). The control group consisted of 110 healthy persons.

Research methods. General clinical, instrumental, biochemical and statistical investigations were used in the work. The parameters of height and weight were assessed and BMI was calculated according to Broca's formula, recommended for evaluation by WHO Committee (1995). Blood lipid spectrum indexes were determined: CHC, LDL, TG, HDL, atherogenicity coefficient.

RESULTS OF THE STUDY. The results of anthropometry revealed the following changes. BMI averaged 24.7±3.45 kg/m2 in group 1, 27.6±2.43 kg/m2 in group 2, (p=0.04*), and 23.3±3.07 kg/m2 in control group, (p>0.05). Among the patients in Group 1 normal body weight was found in 68 (53,9%) patients, in Group 2 only in 12 (11,5%) patients (p<0,001*), in the control group 76 (69,1%) were found (p2<0,01*).

Excessive body weight in the 1st group was revealed in 50 (39,7%) patients, in the 2nd group in 69 (66,3%), (p1<0,001*), in the control group was revealed in 32 (29,1%) men (p2<0,05*). Grade I obesity in the 1st group was observed in 4 (3,2%) patients, in the 2nd group in 15 (14,4%), (p<0,001*), in the control group it was observed in 2 (1,8%) persons (p2>0,05*). Grade II obesity in the 1st group was detected in 3 (2,4%) patients, in the 2nd group in 5 (4,8%), (p1>0,05). Grade III obesity in Group 1 was found in only 1 (0.8%) patient, in Group 2 and 3 (2.9%) patients, (p1>0.05) (Table 1).

Table 1
Characteristics of patients with CHD according to anthropometric data

Anthropometric indicators	Group 1 (n=126)	Group 2 (n=104)	Control group (n=110)	Mann-Whitney-Wilcoxon p-value test
BMI (kg/m2)	24,7±3,45	27,6±2,43	23,3±3,07	1vs2: p=0,04* 1vs3: p>0,05
Normal body weight	68 (53,9%)	12 (11,5%)	76 (69,1%)	1vs2: p<0,001* 1vs3: p<0,01*
Overweight body	50 (39,7%)	69 (66,3%)	32 (29,1%)	1vs2: p<0,001* 1vs3: p<0,05*
First degree obesity	4 (3,2%)	15 (14,1%)	2 (1,8%)	1vs2: p<0,001* 1vs3: p>0,05
Second degree obesity	3 (2,4%)	5 (4,8%)	0 (0%)	1vs2: p>0,05 1vs3: NA
3rd degree obesity	1 (0,8%)	3 (2,9%)	0 (0%)	1vs2: p>0,05 1vs3: NA

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Our study assessed the influence of DLD on the clinical course of CHD in order to determine the predictors of the prognosis of adverse outcomes. One of the objectives of the present study is the assessment of lipid status in patients with NHS, as a result, we studied the lipid spectrum among young and elderly patients. As the study results showed that levels of CHC, LDL, TG in both groups were elevated, CHC in group 2 was increased by 0,33 mmol/l compared to group 1 and was 7,13±0,75 mmol/l and 6,8±0,86 mmol/l respectively, (p<0,001*), in control group the average CHC was 3,32±0,60 (p<0,001*).

There were no statistically significant differences between the groups in terms of HDL level in group 1, 1.0±0.15 mmol/l, in group 2, 0.97±0.16 mmol/l, (p=0.034*), although this index was lower than normal in the elderly group, in the control group this index was 1.2±0.18 mmol/l (p<0.001*). LDL in group 1 was 4.5±0.83 mmol/l, in group 2 4.32±0.62 mmol/l, respectively (p=0.038*), which shows impaired lipid metabolism in patients with CHD, in the control group LDL averaged 2.96±0.83 mmol/l (p<0.001*).

In patients in group 1, TGs were significantly higher and were 3.11±0.92 mmol/L, and in group 2, it was 2.87±0.81 mmol/L, (p<0.0001*); in the control group, TGs were 2.21±0.74 mmol/L (p<0.001*). CA was elevated in both groups, which was 5.92±1.26 in group 1, 6.52±1.2 in group 2 in control group 1.83±0.8 (p=0.03), (Figure 1).

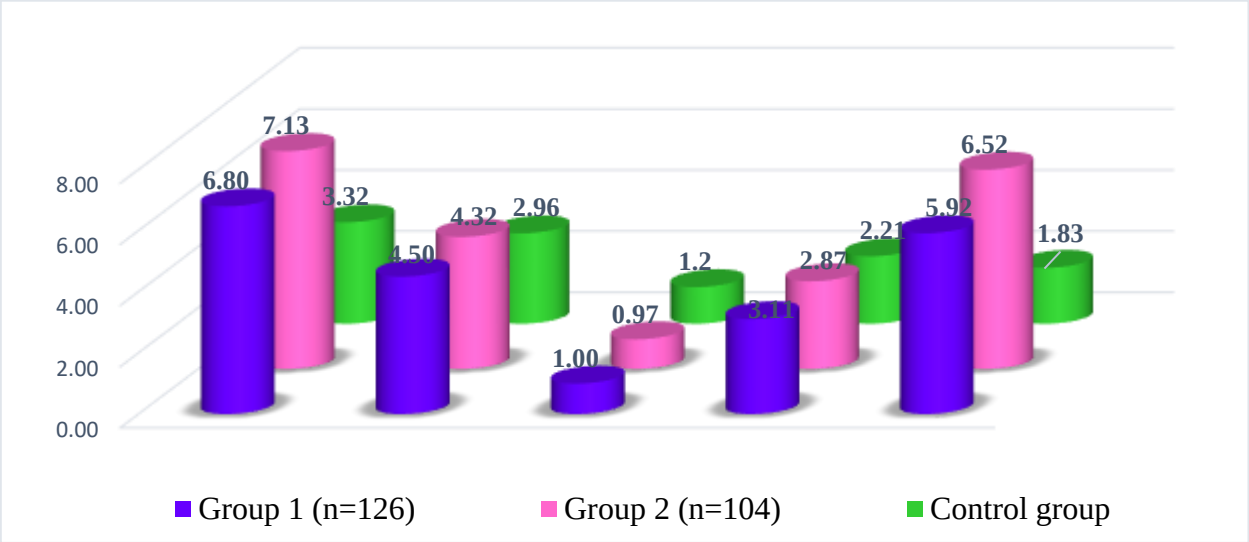

Fig. 1. Indexes of lipid spectrum in patients with CHD and controls

The analysis of lipid spectrum parameters depending on clinical manifestation of CHD in young men revealed that the highest values of atherogenic lipoproteins were observed in patients with acute myocardial infarction (AMI) compared to patients who were hospitalized with the diagnosis of first-time angina and progressive angina pectoris.

This suggests that patients with high LDL, CHC, TG values and low HDL values contributed to an earlier and more severe course of CHD, which were detected in patients with AMI and acute coronary syndrome (ACS). For this reason, these patients need strict control of body weight and LDL, OSH and TG levels, as dyslipidemia can lead to the most formidable complications and may be the cause of early disability in the young population.

Table 2
Lipid spectrum indexes depending on clinical variant of CHD in groups 1 and 2

Lipid spectrum (mmol/l)	Patients with WSF	Patients with PSN	Patients with ACCSST	Patients with OCSDST	Patients with AMIsQ	Patients with AMI patients without Q
	1st group	1st group	1st group	1st group	1st group	1st group

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COX	6.35±1.04	6.83±1.12	7.04±1.07	7.27±0.641	7.99±0.645	6,16±2,49
(3.6-7.8 mmol/l)	4.38±0.793	4.30±0.9	4.66±0.771	5.06± 0.741	4.98±0.086	4.92±0.021
LDL (2.02-4.79 mmol/l)	1.07±0.168	1,0±0,1	0.982±0.161	0.957± 0.132	1.10±0.187	1.10±0.148
HDL (0.72-1.63 mmol/l)	3.06±0.995	2.98±0.983	3.32±0.914	3.38± 0.948	3.38±0.724	2.72± 1.45
TG	6.1±1.1	6.6±1.16	6.82±1.07	7.08± 0.652	7.77±0.631	8.44± 1.01

CONCLUSIONS: Thus, the obtained analyses of lipid profile among patients with CHD showed that LDL in group 1 and group 2 were almost equally elevated compared to the control group and were 6.8±0.86 and 7.13±0.75 mmol/l, TG in group 1 patients were significantly higher and were 3.11±0.92 mmol/l, and in group 2 patients this index was 2.87±0.81 mmol/l.
The lipid profile indices according to the clinical variants of unstable angina and AMI were statistically significant, since the atherogenic lipoproteins were lower in patients with first-onset and progressive angina compared to those in young and elderly AMI patients. High values of atherogenic lipoproteins and atherogenicity coefficient values contributed to the early development of ACS and AMI, which is important for the correction of these disorders.

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