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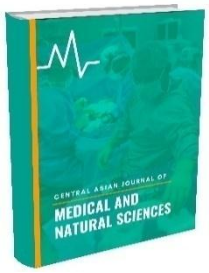

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# Evaluation of Echocardiography in Patients With Coronary Heart Disease Combined With Metabolic Syndrome

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**Annotation:** The growth of morbidity and mortality of cardiovascular pathology has been observed in Uzbekistan in the last two decades and the structure of mortality does not differ from the worlds. Cardiovascular diseases are one of the most important problems of public health in the republic.

**Key words:** Obesity, cardiovascular disease, metabolic syndrome, coronary heart disease, excess body weight.

**Introduction:** Analysis of the causes of mortality has shown that cardiovascular disease mortality remains predominant in the structure of total mortality, amounting to -7821 in 2018. -7821 (56%), in 2019. - 8152 (57.9%) in 2019 and 832 (58.4%) in 2020. - The main causes of cardiovascular mortality are arterial hypertension (AH), coronary heart disease (CHD) and cerebrovascular disease (CVD), which account for at least 90% of all cardiovascular deaths. The mortality rate is significantly higher among men, and it is almost the same among the elderly, regardless of gender. Overweight is a known global epidemic that can have very serious consequences, such as increased risk of morbidity and reduced life expectancy. Although obesity is only one of the risk factors for cardiovascular disease (CVD), it has recently received a great deal of attention from clinicians, as the prevalence of obesity continues to rise around the world. Even after controlling for comorbidities, the risk of cardiovascular events in obesity remains high, making it an independent risk factor for CVDs. Obesity is closely linked to coronary artery atherosclerosis, with a study in young patients with high BMI showing that atherosclerosis begins decades before the clinical manifestation of CHD. Atherosclerotic vascular lesions were more common in patients with higher BMI values compared with patients of normal body

weight. According to longitudinal studies, both the presence of obesity for at least two decades may be an independent risk factor for CHD. An increase in body weight of 10 kg increases the risk of CHD by 12%.

The heart and blood vessels are surrounded by epicardial and perivascular adipose tissue, which plays an important role in maintaining cardiovascular homeostasis by secreting a large number of bioactive substances, adipokines. Most of them (including TNF-alpha, resistin, interleukins, leptin) have pro-inflammatory effects. Adiponectin is secreted exclusively by adipocytes and is one of several adipokines that have a protective effect against cardiovascular disease. Adiponectin influences the regression of LV myocardial hypertrophy and actively participates in the processes of myocardial reperfusion in ischaemic injury, due to its ability to suppress inflammatory processes and apoptosis. Metabolic disorders are more dependent on the severity of inflammatory responses, and the reduction of blood flow in adipose tissue, which leads to spontaneous necrosis of oversized adipocytes and release of inflammatory cytokines. A consequence of adiponectin deficiency is decreased blood flow in adipose tissue, whereas increased levels are associated with an active blood supply in skeletal muscle. Adiponectin levels are decreased in obesity, T2DM, AH, IHD. A kind of contradiction arises: the more severe obesity and the increased number of adipocytes, the lower the concentration of adiponectin in blood. Researchers attribute this to the presence of inhibitors of adiponectin expression or secretion secreted by adipocytes. One such inhibitor has been shown to be TNF-_. Interleukin-6, as well as glucocorticoids and catecholamines, reduce adiponectin expression. Low levels of adiponectin correlate significantly with the development of MI in young patients, regardless of traditional risk factors, and are inversely related to C-reactive protein levels in patients with obesity, T2DM and CHD.

**Material and Methods:** Patients presenting to the hospital were examined. All patients underwent electrocardiographic examination (ECG) study in 12 leads using a SCHILLER CARDIOVIT AT-1 portable electrocardiograph, echocardiographic examination (EchoCG) to assess local myocardial contractility and left ventricular diastolic function as well as ejection fraction (EF), i.e. Myocardial contractile function in B- and M-scanning mode, as well as B+M scanning on a MINDRAY DCN3 ultrasound scanner. Morphometric measurements were performed, the thickness of interventricular septum (IVS, cm) of posterior wall of LV (PSLV) and RV (PSV) in systole and diastole, relative wall thickness (RWT) of LV and RV were determined. The contractility of both ventricles (LV and RV) was also assessed.

**Results:** Two groups of patients were examined. The study group consisted of patients with CHD and AH. Males accounted for 69.7%, Females 30.3. The age of the patients ranged from 59 ± 9 years with an excess body weight of 34.7 ± 9.4 kg. Of the patients surveyed, 69% had myocardial infarction and 11% had arterial hypertension, of which 27.7% had Grade III AH, and 23.3% had Grade III AH. Atrial fibrillation was also detected in 21.9% of the patients.

| Indicator | | Normal | 1 Group (35) | 2 Group (35) |
|---|---|---|---|---|
| LA diameter (sm) | **M** | 3,0-4,0 | 4,2 | 4,0 |
| | **F** | 2,7-3,8 | 3,9 | 3,7 |
| Volume of the LA | **M** | 18-58 | 70,1 | 68,1 |
| | **F** | 22-52 | 59,2 | 52,6 |
| IVS (sm) | **M** | 0,6-1,0 | 1,5 | 1,4 |
| | **F** | 0,6-0,9 | 1,2 | 1,1 |
| LVPV (sm) | **M** | 0,6-1,0 | 1,3 | 1,2 |
| | **F** | 0,6-0,9 | 1,2 | 1,0 |
| LVPWd (sm) | **M** | 4,2-5,9 | 4,8 | 4,8 |
| | **F** | 3,9-5,3 | 4,6 | 4,6 |

| | | | | |
|---|---|---|---|---|
| EDV (ml) | **M** | 67-155 | 121,3 | 108,1 |
| | **F** | 56-104 | 93,2 | 89,9 |
| ESV (ml) | **M** | 22-58 | 43,3 | 39,5 |
| | **F** | 19-49 | 32,6 | 33,5 |
| LVEF (%) | | ≥55% | 64,8 | 63,7 |

While there were no significant differences in intracardiac hemodynamic parameters, which corresponded to normal values regardless of obesity degree, the 2-3 degree obesity was associated with an increase in LV myocardial mass, especially in females, which seems to be associated with the prevalence of female patients in our study. Increased left atrial end-systolic volume was observed in all patients, but was more pronounced in both men and women with 2-3 degree obesity (group 2). When assessing the nature of LV remodeling in both groups, more than half of the development of LV hypertrophy of predominantly concentric form was observed in the patients. **Discussion:** The findings suggest that overweight combined with CHD leads to an additional increase in right ventricular burden, which is manifested by a significant increase in the diameter of the right ventricular outflow tract and a decrease in the amplitude of movement of the fibrous ring of the lateral wall of the right ventricle, a parameter characterizing the systolic function of the right ventricle, compared with group 2 patients.

**Conclusions:** The most reduced systolic myocardial function was found in the group of patients suffering from CHD in combination with AH.

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