CHANGES OF QUANTITY OF ALT AND AST IN THE DISEASE OF HEART FAILURE AND ISCHEMIC HEART DISEASE

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✓ *Resume,*

Has a significant diagnostic value - myocardial infarction (in 80-100% of cases). AST begins to increase after 4-6 hours after the onset of pain syndrome or its equivalent, and after 24-48 hours reaches its maximum value, and returns to normal after 4-7 days.

There is no significant diagnostic value - hepatitis, a deficiency of the right heart, hemolysis, damage to the muscles, kidneys, brain.

Alanine aminotransferase - (ALT) (Glutamic-pyruvic transaminase - GPT) It is contained mainly in the cytoplasm of the hepatic cells.

Key words: ALT, AST, ischemic,disease of heart failure.

ЮРАК ЕТИШМОВЧИЛИГИ ВА ИШЕМИЯ ХАСТАЛИКЛАРИДА АЛТ ВА АСТ МИҚДОРЛАРИ ЎЗГАРИШИ

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Инфаркт миокард ташхисида 80 - 100% ҳолларда диагностик аҳамиятга эга бўлган кўрсаткич бу - қон таркибидаги ўзгаришлар ҳисобланади. АСТ юрак касаллиги туфайли оғриқ синдроми бошланганида 4 - 6 соат ўтиб кўтарила бошлайди. Ёки унинг максимал миқдори 24 - 28 соат ўтиб келиб чиқади. 4- 7 кундан сўнг яна нормага қайтади.

АЛТ ва АСТ жигар ҳужайралари цитоплазмасида бўлади.

Калит сўзлар: АСТ,АЛТ, ишемия, юрак етишмовчилиги.

ИЗМЕНЕНИЯ КОЛИЧЕСТВА АЛТ И АСТ ПРИ БОЛЕЗНИ СЕРДЕЧНОЙ НЕДОСТАТОЧНОСТИ И ИШЕМИЧЕСКАЯ БОЛЕЗНИ СЕРДЦА

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Имеющее существенное диагностическое значение - инфаркт миокарда (в 80-100% случаев). АСТ начинает повышаться через 4-6 часов после возникновения болевого синдрома или его эквивалента, а через 24-48 часов достигает максимального значения, а возвращается к норме через 4-7 суток.

Аланинаминотрансфераза - (АЛТ) (глутамикопировиноградная трансаминаза - ГПТ). Она содержится главным образом в цитоплазме печеночных клеток.

Ключевые слова: АСТ,АЛТ, ишемия, сердечной недостаточности.

The prevalence of clinically severe chronic heart failure (CHF) in a population of at least 1.5-3.0%. Among persons older than 65 years, the frequency of CHF increases to 6-10%, and decompensation becomes the most common cause of hospitalization of elderly patients. The number of patients with asymptomatic ventricular dysfunction is not less than 4 times the number of patients with clinically severe CHF. Over 15 years, the number of hospitalizations with adiagnosis of CHF has tripled, and over 40 years has increased 6 times. The five-year survival of patients with CHF is still below 50%. The risk of sudden death is 5 times higher than in the population. In the United States, there are more than 2.5 million patients with CHF, about 200 thousand patients die annually, 5 years after the onset of signs of CHF, the survival rate is 50%.

Chronic heart failure (CHF) is a cardiac-related impairment (pumping) function with the corresponding symptoms, consisting in the inability of the circulatory system to deliver the amount of blood to the organs and tissues necessary for their normal functioning. Thus, it is a disproportion between the state of blood circulation and metabolism, which increases with the increase in the activity of vital processes; pathophysiological state in which the impaired function of the heart does not allow it to maintain the level of blood circulation necessary for metabolism in the tissues.

CHD. From the existing classification, especially often acute myocardial infarction (AMI) and ischemic cardiomyopathy (ICMP is a nosological unit introduced into ICD-10 clinical practice) that leads to the development of CHF. The mechanisms of the onset and progression of CHF due to AMI are due to changes in geometry and local myocardial contractility, called the term "left ventricular remodeling" (LV), with ICMP there is a decrease in total myocardial contractility, called the term "hibernation" myocardium.

Causes and risk factors for coronary heart disease

The overwhelming majority (97-98%) of clinical cases

of coronary artery disease are due to atherosclerosis of the coronary arteries of varying severity: from a slight narrowing of the lumen of an atherosclerotic plaque to complete vascular occlusion. At 75% coronary stenosis, the heart muscle cells respond to a lack of oxygen, and patients develop angina.

Other causes of coronary artery disease are thromboembolism or spasm of the coronary arteries, usually developing against the background of an existing atherosclerotic lesion. Cardiospasm aggravates obstruction of the coronary vessels and causes manifestations of coronary heart disease.

Factors contributing to the occurrence of CHD include:

hyperlipidemia

Promotes the development of atherosclerosis and increases the risk of coronary heart disease by 2-5 times. The most dangerous in terms of the risk of coronary artery disease are hyperlipidemia types IIa, IIb, III, IV, as well as a decrease in the content of alpha-lipoproteins.

Hypertension increases the likelihood of developing CHD 2-6 times. In patients with systolic blood pressure = 180 mm Hg. Art. and higher ischemic heart disease occurs up to 8 times more often than in hypotensive and people with normal blood pressure.

smoking

According to various sources, cigarette smoking increases the incidence of coronary artery disease by 1.5-6 times. Mortality from coronary heart disease among men 35-64 years old, smoking 20-30 cigarettes daily, is 2 times higher than among non-smokers of the same age category.

Physically inactive people are at risk for CHD 3 times more than those who lead an active lifestyle. When combined hypodynamia with overweight, this risk increases significantly.

In case of diabetes mellitus, including latent diabetes, the risk of the incidence of coronary heart disease increases by 2-4 times.

The factors that pose a threat to the development of CHD should also include the burdened heredity, male gender and elderly patients. With a combination of several predisposing factors, the degree of risk in the development of coronary heart disease increases significantly.

The causes and speed of ischemia, its duration and severity, the initial state of the individual's cardiovascular system determine the occurrence of one or another form of coronary heart disease.

All laboratory tests that are performed in cardio-vascular pathology, namely, patients with heart disease, can probably be divided into different groups: studies that are done in the clinic and hospital, private medical center. The difference, in most cases, will be both in volume and the most, sometimes unpleasant, in quality.

The results in the clinics themselves may also differ: somewhere they do it in hardware, and somewhere in the old fashioned way, at the "eye", somewhere they do 2-3 indicators, somewhere 5-8, and somewhere for your money is all "what pleases." Even in the hospitals themselves, the range of laboratory tests performed may differ: in specialized cardiology centers, hospitals providing emergency care to patients with heart diseases, as a rule, a complete list of laboratory points of interest needed to clarify the diagnosis and determine the tactics of further treatment is performed, and general hospitals will only standard set. And this is due not so much to the fact that doctors of the worst qualification work there,

but to the fact that today laboratory diagnostics is a very expensive share of the budget of any hospital. And the faster this blood test can be done and better, the less blood is collected and more data can be obtained, the more expensive it will be. Alas, but this is the reality of modern technology!

Results of laboratory research: Before talking about the test results, I would like to point out and focus your attention once again that the results of laboratory tests themselves, without a characteristic clinical picture, without instrumental data, sometimes taken once, do not speak about anything else. But, if, nevertheless, you are interested in the numbers on a piece of paper with the inscription "blood test ...", then not everything is so bad, and it turns out you care about your health! And we will try to help you deal with these mysterious figures! So, what are these analyzes say, if there are pains in the heart area.

Indicators of the total blood count, common for men and women, the erythrocyte sedimentation rate (ESR): 1 - 15 mm / h; in case of acute myocardial damage, it begins to increase from the first three days, maintaining high values for 3-4 weeks, less often longer. At the same time, it is necessary to take into account its initial value, since in adults it is possible to increase the ESR due to concomitant pathology. A return to normal indicates an end to non-specific inflammation in the area affected by necrosis. As a result of the fact that the ESR begins its growth during the first three days, remaining at this level later on, and the blood leukocytes at the end of the first week or from the beginning of the second tend to decrease, a kind of "scissors" of these two indicators are formed. Increased ESR is also observed in acute pericarditis, cardiac aneurysm.

- total number of leukocytes: 4.0 - 9.0 * 109 / l; in acute myocardial infarction (AMI), by the end of the first day, leukocytosis may be observed (up to 15-20 * 109 / l). However, some authors point out parallels between the level of leukocytes and the size of the necrosis of the heart muscle. And at the same time, leukocytosis may be absent in an areactive state in elderly persons. Increased leukocyte levels can be observed in acute pericarditis, cardiac aneurysm.

-the total number of red blood cells: 4.5 * 1012 / l; as a rule, cardiovascular complaints appear in patients with chronic heart disease when they decrease red blood cells and hemoglobin: excessive pain, tingling, and constriction.

- hemoglobin level: 120 - 160g / l; reflects the saturation of red blood cells with a special protein - hemoglobin, which binds oxygen and participates in its transfer to tissues. With low numbers of tissue hemoglobin, including the myocardium, an oxygen "hunger" is experienced, against the background of which ischemia develops, often with the available assumptions leading to myocardial infarction (MI).

- hematocrit 0.36 - 0.48; for this, and the above two indicators can determine the degree of anemia. With acute anemia, a history of cardiac aneurysm, or aorta, and the presence of an appropriate clinic, you can think about the rupture of the aneurysm and bleeding. This is confirmed by the implementation of ECG, echocardiography;

platelets: 180-320 * 109 / l; blood cells that are involved in stopping bleeding. Excessive number of them can lead to blockage of small vessels due to the formation of blood clots, or, in conjunction with impaired coagulation of the blood, to the formation of large blood clots, which can lead to more serious consequences, such as pulmonary embolism. A reduced amount is accompanied by increased bleeding;

"Blood formula", which indicates the relative ratio of other blood cells: plasma cells, young leukocytes, basophils, myelocytes, stab and segmented leukocytes, and also includes eosinophils, monocytes, lymphocytes. This formula, most often, is an indicator of the inflammatory process and the degree of its severity, or as another option - a blood disease. And already on its basis various indexes of intoxication (LII, GUI) can be calculated. In acute myocardial infarction by the end of the first day there may be neutrophilia with a shift to the left. Eosinophils with AMI may decrease, until they disappear, but then, as myocardium regenerates, their number increases in peripheral blood. An increase in neutrophils is also observed in acute pericarditis.

Indicators of biochemical analysis of blood

total protein: 65-85g / l, the indicator of the content of all proteins in the blood, a more detailed ratio of individual proteins that help in the diagnosis of heart disease, is determined in the proteinogram;

bilirubin: 8.6-20.5mkol / l, one of the indicators of liver robots, in particular, pigment metabolism, and precisely in cardiac pathology, in its pure form, does not carry information on the disease of the cardiovascular system;

urea: 2.5-8.3 mmol / l, in most cases shows the work of the kidneys, and is always considered in combination with the following indicator - creatinine;

creatinine: 44-106 χmol / l, a product of protein metabolism, depends not only on the amount of protein in the body, but also the speed of its metabolic processes;

The determination of enzymes contained within cells is important in the diagnosis of diseases associated with myocardial damage. And depending on what and how many cells die, their values will also change:

ALT (alanine aminotransferase): up to 68 U / L, when assessing the level of this enzyme, it is necessary to take into account that it is contained not only in the myocardium, but to a greater extent in the liver, therefore AST and ALT are always determined together, which helps in differentiating the heart damage and the liver. The timing of the increase in ALT is similar to AST.

AST (aspartate aminotransferase): up to 45 U / L, this enzyme is found in large quantities in the myocardium, and its increase, in most cases, indicates damage to the cardiomyocytes - the muscle cells of the heart; An increase in AST in the serum is observed in myocardial infarction (95-98%) of cases already after 6-12 hours from the onset of the disease. The maximum increase is noted for 2-4 days, and for 5-7 days the level of the enzyme comes to normal. There is a clear relationship between the AST figures and the size of the hearth of necrosis of the heart muscle. Therefore, when the magnitude of necrosis is less than 5 mm in diameter, it is possible to maintain the level of this enzyme within the normal range, which must also be taken into account.

LDH (lactate dehydrogenase) and its constituent fractions: up to 250U / l, is considered a specific marker for AMI, an increase in the activity of the isoenzyme LDG1 and LDG2, even with normal indicators of total LDH activity, indicates the presence of small necroses in the heart muscle. With AMI, its level increases rapidly in 2-4 days, and normalizes only in 2-3 weeks. LDH levels provide valuable information about myocardial infarction throughout the disease. Other fractions of LDG3 and LDG4 are lung tissue enzymes, LDG5 is the liver.

Creatine phosphokinase and fractions constituting this enzyme: up to 190 U / l, creatine phosphate kinase is considered a specific marker (especially an increase of more than 10 times) in acute myocardial infarction. Increases in the acute period (in the first 4-8 hours from the onset of the disease), far ahead of the activity of the above listed enzymes and is a marker for early diagnosis of AMI, especially the CPK-MB isoenzyme. After 8-14 hours, the CPK value can reach a maximum value, and normalization can occur in 3-4 days. Also, the value of CPK may increase with myocarditis;

Troponin test: up to 0.4 χg / l. Troponin is a specific contractile protein that is part of the structure of the heart muscle and skeletal muscle. This test is a diagnostic marker for suspected acute damage to myocardial cells, is one of the key results in the diagnosis of acute myocardial infarction; myoglobin: 12-92 χg / l. Muscle tissue protein involved in cell respiration. If it appears in the blood, it is regarded as a breakdown product of the muscle tissue of the heart or skeleton, at the appropriate clinic, may indicate necrosis (necrosis) of the heart muscle tissue, therefore it is also considered a specific marker of this pathology. After 2-4 hours from the onset of the disease, its concentration increases. The maximum concentration of myoglobin in the blood reaches 6-8 hours of AMI. Normalization of its level occurs in 20-40 hours. The extent and duration of its increased level can be judged on the size of the necrosis, the prognosis.

Indicators of ALT, AST, KFK, KFK-MV, LDH, myoglobin and troponin test correlate closely with the size of the hearth of necrosis in the heart muscle, and therefore have not only diagnostic but also prognostic value.

Acid phosphatase: 67-167 nmol / (s · L), increases in activity in patients with severe, complicated myocardial infarction, mainly transmural;

C-reactive protein (CRP): up to 0.5 mg / l, its detection indicates the presence in the body of the pathological process, in particular inflammatory or necrotic. It refers to the so-called "acute phase" proteins. A sharply positive response to CRP indicates the severity of the inflammatory process.

Sialic acids: 2.0-2.36 mmol / l, the content of sialic acids may increase with endocarditis, MI; electrolytes, mainly represented by K + ions (norm 3.6 - 5.2 mmol / l), Na + (norm 135 - 145 mmol / l), Cl- (norm 100 - 106 mmol / l), Ca2 + (norm 2, 15-2.5 mmol / l). An increased amount of potassium in serum may be accompanied by a clinically disturbed cardiac rhythm, which is confirmed when performing an ECG. Atrioventricular block of the cardiac conduction system may develop, develop syndrome of premature excitation of the ventricles, ventricular fibrillation, and such a terrible disorder as cardiac arrest. Therefore, patients with cardiac arrhythmias need to control the content of K + ions in the body. On the other hand, a decrease in potassium in the blood can also lead to adverse effects in these patients - myocardial hyporeflexia. Reducing the level of sodium ions may be accompanied by the development of cardiovascular insufficiency, since the ratio of K + and Na + ions, as regulators of the processes in the cell, is in constant interaction and a decrease in one leads to an increase in the other ion. Hyperchloremia is observed in patients with kidney disease, and may also lead to the development of cardiovascular insufficiency; serum glucose: 3.3 - 5.5 mmol / l, an excess of glucose level, repeated in several tests, may indicate the development of diabetes mellitus (DM). The result of another analysis,

glycated hemoglobin (HbA1c), makes it possible to assess the degree of compensation of carbohydrate metabolism in a patient over the past 3 months. This is important for the reason that in the case of initially diagnosed diabetes, already 11% of people have a lesion of the cardiac conduction system. And many patients do not even realize this. Another complication of diabetes is the destruction of vessels not only of the trunk type, but also of small ones, which directly bring nutrients to the tissues. In this regard, patients with high blood sugar should additionally undergo instrumental examination, primarily electrocardiography and ultrasound of the leg arteries indicators (acid-base balance) have an indirect effect on the state of the cardiovascular system due to changes in homeostasis and are important, first of all, to specialists for the correction of the prescribed treatment;

The profile of proteinograms is a spectrum of various proteins (albumin, $\alpha 1$, $\alpha 2$, β, γ-globulins, albumin-globulin index), which are part of the blood, and under various conditions (acute myocardial damage, inflammation, burns, cancer, etc. .), their ratio can vary, even a pathological protein appears - paraprotein. So the increase in $\alpha 1$ and $\alpha 2$-globulin occurs in patients with extensive myocardial infarction.

Increasing the amount of γ-globulin may be due to excessive accumulation of cardiac antibodies in the body and precede the occurrence of post-infarction syndrome (Dressler's syndrome). The long-lasting high content of $\alpha 2$-globulins (during the month) indicates a weak intensity of reparative processes in the area of necrosis, which causes a prolonged course of myocardial infarction and aggravates the prognosis of the disease.

Lipid spectrum associated with the common man with the word "cholesterol". In this case, the substances (lipoproteins of various densities, triglycerides) that are involved in the exchange of cholesterol (cholesterol) (the norm in the blood - 3.1 - 5.2 mmol / l) are determined. The number of deaths from coronary heart disease in recent years has increased from 5: 1,000 people with a total cholesterol level of 5.2 mmol / l, with 6.2-6.5 mmol / l - 9: 1000 people, and 17: 1000 with 7 , 8 mmol / l. In addition to the value of total cholesterol, an important indicator is the atherogenic index (up to 4), which shows the ratio of "good" and "bad" lipids involved in the metabolism of fat and cholesterol, and the threat of the development or progression of atherosclerosis and all the ensuing consequences. An increase in the fractions of lipoproteins and triglycerides can be either aphysiological condition (alimentary) or apathological condition. Lipid elevation is characteristic of widespread atherosclerosis, which accompanies obesity and causes arterial hypertension. Or rather, it is a violation of the internal organs and intermediates of lipid and triglyceride metabolism, expressed as an increase in the atherogenic index, causing cholesterol deposition in vessels of different diameters, deposition of "reserve fat", which leads to the diseases listed above. Therefore, with widespread atherosclerosis, in this blood test, you can see elevated values of β-lipoproteins and total cholesterol. However, you can see a decrease in the concentration of phospholipids. But at the same time it is necessary to take into account the fact that there are age fluctuations of fats in the blood. So in older men, the level of total cholesterol, triglycerides, β-lipoproteins is elevated, compared with that in middle age, and in senile ones, on the contrary, they decrease.

A coagulogram is an analysis that can be used to see the "viscosity" of the blood, or in other words, whether there is a risk of blood clots, which can lead to the formation of blood clots with different localization, which in turn can be complicated by pulmonary embolism, which causes instantaneous death. Or, on the contrary, to see how high the probability of bleeding is and whether it can stop on its own after the operation, for example, by prosthetic heart valve.

Conclusion

Thus, if you look, there is a need for almost all those who seek medical help to perform with a certain frequency, especially with chest pains, at least, an ECG, on which heart disease is suspected or determined, which will be confirmed after taking blood tests and their final confirmation. A good option for monitoring the heart is the Cardiovisor device, as it allows you to monitor the work of the heart at home and inform the person in advance about impending pathological changes in the functioning of the cardiovascular system. Thanks to the service Kardi.ru, the looming pathology in the work of the heart will be noticed in advance, which allows you to prevent complications that often do not go away without consequences for human health. Additionally, in terms of cardiac examination, it is possible to perform EchoCardioGraphy, AngioKT, angiography, radionuclide load test (thallium examination), and performance of functional tests.

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