

Possibilities of endogenous bioresonance therapy

in the treatment of acute myocardial infarction in experiment

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Myocardial infarction is one of the clinical forms of ischemic heart disease, occurring with the development of ischemic necrosis of the myocardial area, caused by absolute or relative insufficiency of its blood supply. The focus of necrosis in the myocardium has an adverse effect on the activity of the heart as a whole, which is manifested by a violation of the rhythm and a decrease in its pumping function. The degree and nature of the disorders depend on the location and prevalence of the heart attack. In this aspect, methods are of interest that allow to reduce the zone of necrosis and improve the repair processes [1].

The heart muscle necrotized during an acute myocardial infarction releases a large amount of enzymes into the blood. The release rate of various specific enzymes is not the same. The change in the level of enzymes in the blood over time is of great diagnostic value.

Creatine phosphokinase (CPK) - an enzyme found mainly in the myocardium, skeletal muscles, brain and thyroid gland. With the development of myocardial infarction, an increase in CPK activity in the blood is usually observed 6-8 hours after the onset of a painful attack and reaches a maximum on average by the end of the first day of the disease. On the 2-3rd day of a heart attack, CPK activity often returns to normal, although with extensive heart attacks it can last longer.

An increase in the activity of CPK in the blood is determined in almost all patients with acute myocardial infarction. It should be borne in mind that in most cases, CPK increases significantly only 6-8 hours after an anginal attack. The absence of a significant concentration of CPK in other internal organs, except for the heart, sharply increases the specificity

this assay is compared to the determination of ACT activity. The degree of increase in CPK activity informs the doctor about the size of myocardial infarction and the prognosis.

Determination of CPK isoenzyme in blood - MV-CPK. MB-fraction of creatine phosphokinase (MB-CPK). Unlike other types of CPK (BB-reaction, which is mainly contained in the brain, and the MM-fraction secreted from skeletal muscles), MB-CPK is present in significant concentration practically only in the myocardium. Therefore, in clinical practice, it is believed that an increase in the activity of MB-CPK in the blood indicates damage to the heart muscle. In most clinics in the world, the determination of CPK and MB-CPK has become a standard examination even for those patients in whom the diagnosis of myocardial infarction is beyond doubt according to the clinic and ECG data. This is explained by the fact that the degree of increase in their activity in the blood correlates with the size of myocardial infarction and makes it possible to assess the danger of severe hemodynamic disturbances and the prognosis in general, which is very important for the correct management of the patient [8].

Lactate dehydrogenase (LDH). The content of CPK and MB-CPK in the blood often returns to normal already on the 2nd or 3rd day of acute myocardial infarction.

The LDH activity in the blood rises much later than CPK - only 24-48 hours after the development of necrosis, reaches its maximum values usually on the 3-6 day of the disease and returns to normal after 1-2 weeks. However, the determination of the total activity of LDH turned out to be, although a sensitive, but not very specific sign of the death of cardiomyocytes.

Our earlier experimental studies found that BRT stimulates cell proliferation and accelerates the processes of liver, skin and blood regeneration in white rats [2-4]. Based on this, it can be assumed that in acute myocardial infarction, the use of bioresonance therapy will stimulate the division of fibroblasts, accelerate the formation of a scar and stabilize the patient's condition, with the aim of further effective treatment. We did not find scientific studies on the study of the possibilities of the method of endogenous bioresonance therapy in the treatment of acute myocardial infarction in the experiment and clinic.

Based on the above, we set ourselves purpose: and to study the effect of endogenous bioresonance therapy on the content of serum enzymes in the blood, in dynamics in acute myocardial infarction in the experiment.

Objects and research methods

The object was adult white rats weighing 160-180 g (n = 126). The animals were

divided into the following groups: Control group (intact animals). Experimental group I: animals that underwent ligation of the left coronary artery (model of acute myocardial infarction). Experimental group II: acute myocardial infarction + sessions of endogenous BRT. Experimental model of acute myocardial infarction, according to G. Selye [7]. The method of endogenous bioresonance therapy was carried out using the hardware-software complex "IMEDISEXPERT" manufactured by the firm "IMEDIS" (Russia) [6]. In the first 2 weeks after the reproduction of acute myocardial infarction, sessions of endogenous BRT were performed every day, lasting 30 minutes. In the future, BRT sessions were carried out every other day, up to the 30th day. The animals were euthanized under ether anesthesia. After decapitation, 5 ml of blood was taken in tubes with heparin. The blood tubes were left at room temperature for 20 minutes and then centrifuged at 3000 rpm. The enzyme content in the supernatate was determined: creatine phosphokinase (CPK), MB-fraction of creatine phosphokinase (MB-CPK), lactate dehydrogenase (LDH). The reliability of the data obtained was assessed by the Student's test.

results

The dynamics of the concentration of enzymes CPK, MV-CPK LDH, most often used for the diagnosis of acute myocardial infarction is presented in table. 1 and 2 and in Fig. 1-3.

Table 1

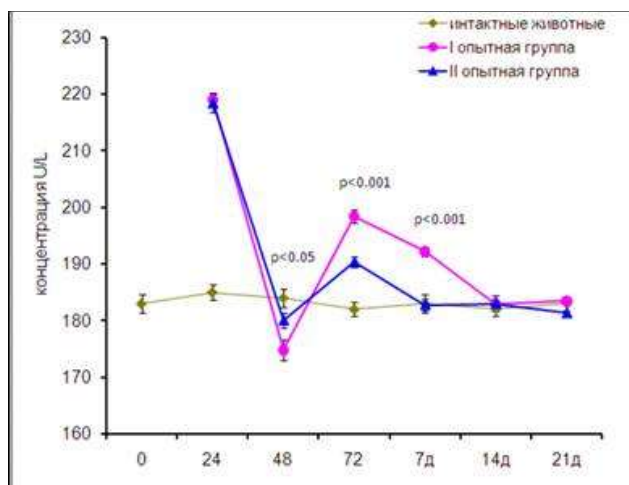
The content of serum enzymes in the blood of intact and experimental animals (groups I and II) within 72 hours after ligation of the left coronary artery

Serum enzyme	the control (n = 42)	24 hour (n = 7)		48 hours (n = 7)		72 hours (n = 7)	
KFK	183 one	220 ± 2.5	218 ± 1.5	175 ± 1.3	180 ± 1.6	198 ± 1.4	190 ± 1.4
KFK MV	60 1.5	367 ± 1.5	368 ± 1.1	85 ± 1.5	61 ± 0.8	127 ± 2.4	123 ± 1.8
LDH	552 17.9	925 ± 3.6	930 ± 1.5	605 ± 2.2	518 ± 11.2	758 ± 1.8	732 ± 8

table 2

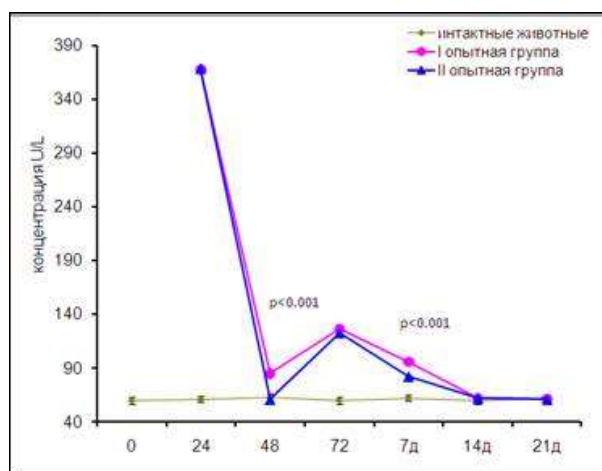
The content of serum enzymes in the blood of intact and experimental animals (groups I and II) from the 7th to the 21st day after ligation of the left coronary artery

Syvoro-accurate enzymes	the control (n = 42)	7 days (n = 7)		14 days (n = 7)		21 days (n = 7)	
		I group	II group	I group	II group	Group I	Group II
KFK	183 one	192 ± 0.9	183 ± 0.8	183 ± 0.9	183 ± 0.6	183.5 ± 0.6	181 ± 0.34
KFK MV	60 1.5	96 ± 1.4	83 ± 1	62 ± 0.8	62 ± 0.6	61.5 ± 0.5	61 ± 0.3
LDH	552 17.9	624 ± 1.5	603 ± 1.5	501 ± 1.8	502 ± 1.6	513 ± 1.8	501 ± 0.4



Rice. one. Influence of endogenous bioresonance therapy on the content creatine phosphokinase (CPK) in the blood of white rats in dynamics with experimental acute myocardial infarction. Control group - intact animals. Group I - model of acute myocardial infarction, Group II - animals with acute myocardial infarction + endogenous BRT.

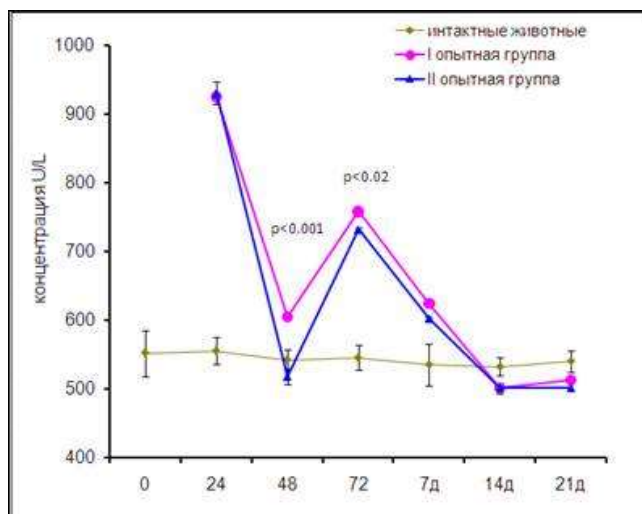
As can be seen from the data presented (Fig. 1, Tables 1 and 2), in the first 24 hours, after the onset of acute myocardial infarction, there was a sharp decrease in the CPK content in both groups, which was 220 ± 2.5 and 218 ± 1.5 , respectively. After 48 hours, there was a sharp decrease in the CPK content in both groups and even lower than in the control group. The content of CPK by 72 hours in group I was 198 ± 1.4 , and in the second group 190 ± 1.4 . By the 7th day of the development of acute myocardial infarction in group 1, its content remained high, while in group II, its content returned to normal. On the 14th and 21st days of AMI, the indicators in both groups remained within the normal range.



Rice. 2. Influence endogenous bioresonance therapy on the content MV-fractions creatine phosphokinase (CPK-MB) in the blood of experimental animals in dynamics with experimental acute myocardial infarction. Control group - intact animals. I group - model of acute myocardial infarction, group II - animals with acute myocardial infarction + endogenous BRT

As can be seen from Fig. 2 and tab. 1 and 2, the content of the MB-fraction of creatine phosphokinase (MB-CPK) 24 hours after the reproduction of the experimental model of acute myocardial infarction (AMI), the content of MB-CPK sharply increases in groups I and II: 367 ± 1.5 and 368 ± 1.1 , respectively, compared with intact animals. By 48 hours, the content of MV-CPK decreases to the control values, while in the first experimental group, although its content decreases, it still remains above the control values. By 72 hours after the development of acute myocardial infarction in group I animals, the activity of CPK-MB increases again, but with much lower values - 127 ± 2.4 U / L. On the 7th day after the formation of AMI, the content of the CPK-MB enzyme remained elevated - $96 \pm$

1.4 U / L. On the 14th day after the formation of AMI, the CPK-MB indicator was within the normal range. In group II, animals that received endogenous BRT for 30 minutes according to the algorithm described above 1 hour after the operation of creating the AMI model, by 72 hours the CPK-MB values of groups I and II practically did not differ. By the 7th day of AMI formation, the CPK-MB values of group I were slightly higher than the CPK-MB values of group II, and by the 14th day of AMI formation, the CPK-MB index in both groups was similar to the control group (intact animals).



Rice. 3. Influence of endogenous bioresonance therapy on the content lactate dehydrogenase (LDH) in the blood of white rats in dynamics with experimental acute myocardial infarction. Control group - intact animals. Group I - model of acute myocardial infarction, Group II - animals with acute myocardial infarction + endogenous BRT

Analysis of the curves shown in Fig. 3 showed that, unlike CPK and CPK-MB, the positive effect of endogenous BRT sessions on the normalization of the LDH enzyme content is less pronounced. Normalization of the LDH enzyme content in the blood of animals occurs only after two weeks.

Thus, our studies have shown that conducting sessions of endogenous bioresonance therapy in acute myocardial infarction in the experiment has a positive effect on the normalization of serum enzyme parameters. The greatest normalizing effect of endogenous BRT sessions had on the content of the CF fraction of creatine phosphokinase (CPKMP). Based on the results obtained, it can be concluded that against the background of BRT, the death of cardiomyocytes stops earlier, and this is evidenced by a more rapid normalization of the MV-CPK fraction. The results of histological studies will make it possible to assess the effect of BRT on the spread of the necrosis zone.

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