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USAGE OF GDV BIOELECTROGRAPHY IN INTEGRATED EVALUATION OF EFFECTIVENESS OF THE METABOLIC CORRECTION

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Introduction.

Maintenance of normal vital functions of an organism in changed environment is provided by the inclusion of reserve physiological mechanisms and is characterized by more intensive course of metabolic reactions directed at the compensation of the power expenses. Excessively intensive work of the homoeostatic systems of an organism during adaptable reorganization of the metabolism causes the necessity of application of means of correction for the prevention of the metabolic shifts caused by the influence of external factors.

Materials and methods of research.

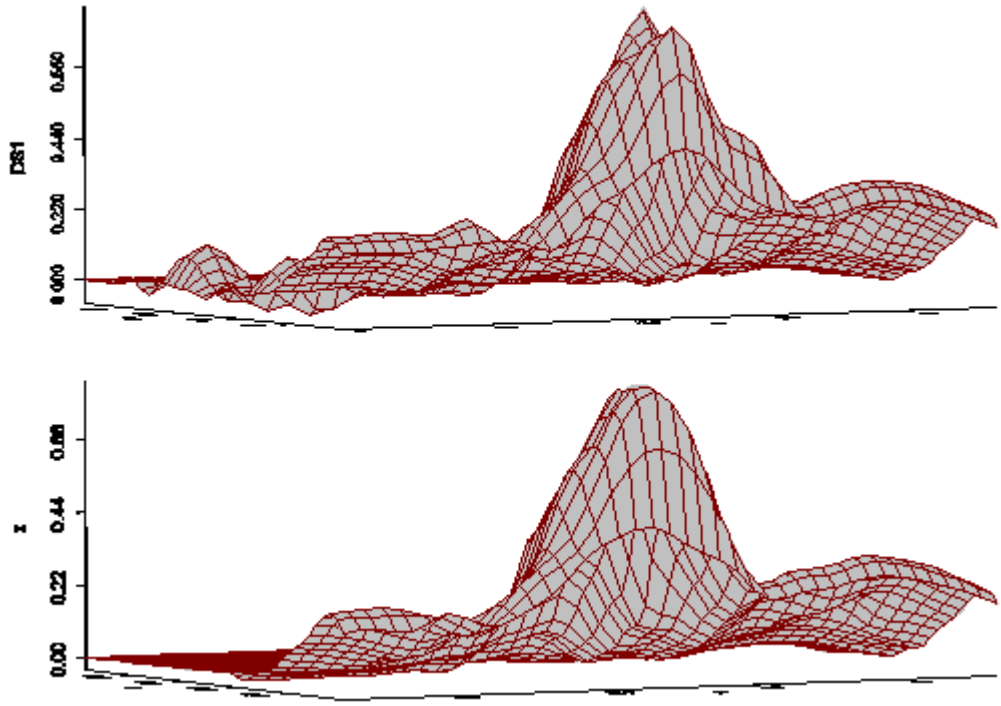
During a search of metabolic correctors, we chose the glycin (amino acid "glycin"), taking into consideration the fact of absence of any negative displays of after action with a drug, convenience of dosage and taking the substance positive influence on efficiency. 20 volunteers taking glycin sublingually in a daily doze 0,2 gr twice a day within three weeks participated in the experiment. In order to have full understanding of the metabolic changes occurring as a result of taking the glycin, red blood tests were carried out (hemoglobin, the color parameter, the average saturation of the erythrocytes with hemoglobin, the average concentration of hemoglobin in the erythrocyte); the content of substances with low and average molecular weight (SL&AMW) and olygopeptides (OP) in supernatants of erythrocytes and plasma of blood [1] with the subsequent chomotographic distillation of supernatants in a column (d=1sm, Molselekt G-25) and the spectral analysis of the received fractions; the parameters of GDV-image [3] (joint area, integral fractality and entropy) of supernatants of erythrocytes and plasma of blood before taking and the day after taking the drug were also determined.

The result of investigation.

After taking glycin the profile of spectrograms of the plasma of blood and erythrocytes supernatants changed due to quantitative and qualitative changes in the composition of middle molecular pool. So, having taken part in the experiment, all the voluntees had the concentration of substances with low and average molecular weight in their blood increased with the growth of their content on erythrocytes (on the average from 22,9±0,60 conventional units up to 24,3±0,62 conventional units, $p<0,05$). This effect may be the result of heightened absorption of SL&AMW with erythrocyte membrane or of increase in the number of erythrocytes taking into consideration the hemopoetic function of glycin. The concentration of OP in blood decreased. Moreover, this change was statistically important for plasma, its level of OP changed on the average from 0,32±0,02 g/l up to 0,26±0,10g/l ($p<0,05$). The registered dynamics of the given indicator reflect, it seems, decreased intensity of proteolysis. It can also be proved by the fact that the qualitative composition of SL&AMW plasma of all the volunteers examined was characterized by decreasing the share of the catabolic constituent part – on the average from 19,7% to 15,9% ($p<0,05$). In some cases the people initially having a rather high level of substances of the catabolic pool (23-31,5%) had their contents 1,5-2 times less (to 15,2-16,8%). Besides, redistribution of SL&AMW in blood occurred, and each

time distribution of the given substances between transport plasma protein and erythrocytes tried to reach the corresponding optimal value of the coefficient (to 0,5).

The analysis of the chromatographic fractioning results showed that the greatest changes in the composition took place in the fractions of erythrocytes from 4 to 7 and in the fractions of plasma from 5 to 8. Fraction changes in blood plasma, were characterized by statistically true value decrease of both extinction (optical density) and the number of spectral peaks (drawing 1). It is established that the biggest OP content is registered in fractions 5 and 6. The same fractions contain the biggest number of irreplaceable amino acid [2]. Consequently in the course of taking glycin, amino acid pool, as a structural basis for protein synthesis, is spent.



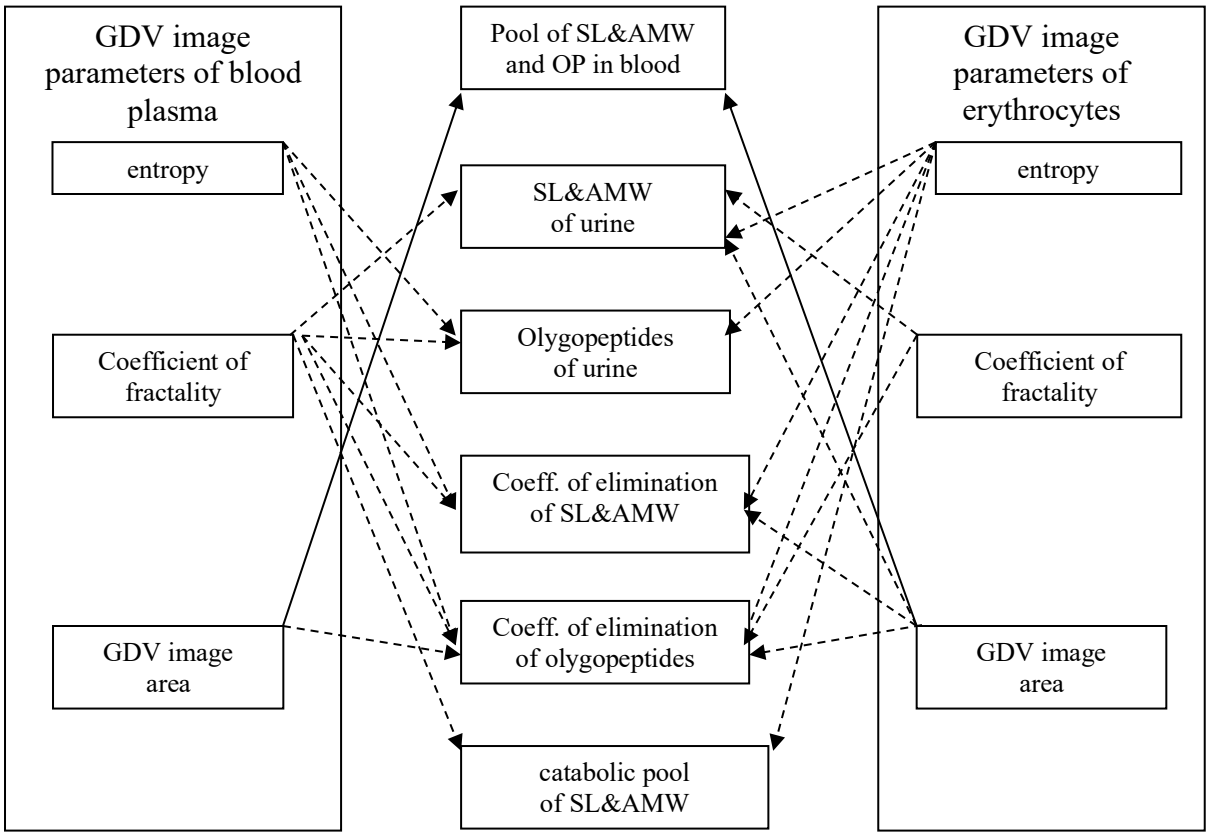
Drawing 1. GDV images of blood plasma fractions before (a) and after (b) taking glycin.

The results of the hematological analysis revealed the tendency for the quantitative indicators of red blood (concentration of hemoglobin, average saturation of erythrocytes with hemoglobin) to grow after taking glycin.

GDV bioelectrographic research studies with the use of various biological liquids found out high sensitivity of the method referring to their composition. It was stated that GDV image area directly depends on nature and entropy in accordance with its definition of chaos, depends, to a greate degree, on the concentration of substance in liquid [3]. After taking glycin numerical parameters of GDV images of blood plasma supernatants and erythrocytes had a certain tendency to change: GDV images area and the entropy of blood plasma went down whereas the same parameters for erythrocytes went up as compared with the initial level. The given dynamics of GDV images indicators conforms to qualitative and quantitative changes of middle molecular pool of substances which after metabolic correction were characterized by decreasing of OP concentration and by decreasing of substances of catabolic origin in blood plasma, they were also characterized by heightened content of SL&AMW on erythrocytes.

Close reverse link of energy emission processes with the level of metabolic tension (r= -0,81) and direct dependence of the average degree with the functional state of erythrocyte system (r= 0,45). We should stress that GDV parameters to be detected have the biggest

numbers of statistically true reverse correlations with the middle molecular pool indicators characterizing the processes of their elimination through kidneys (drawing 2). It conforms to the principle of open biosystems: maintenance of constant homeostasis of an organism is realized due to continuous exchange between substances and energy, on the one hand, and environment on the other.



Drawing 2. Correlation of GDV supernatants parameters of blood plasma and erythrocytes with middle molecular pool parameters: ——— direct; - - - - - - reverse. .

Thus, we may speak of the conformity of numerical GDV images parameters changes, characterizing energy emission processes and middle molecular pool parameters, reflecting direction of substratum flows, which makes it possible to use GDV bioelectrography as an express method of assessment of metabolic effect correction.

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