

ACTION INHIBITOR PROTEIN HEAT SHOCK 27 ON THE ACTIVITY OF GLUTATHIONE PEROXIDASE AND CATALASE IN TUMOR CELLS

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Normally, the accumulation of free radicals in the cells prevents the antioxidant system. With the accumulation of reactive oxygen species formed by oxidative stress, often accompanied by increased levels of heat shock proteins. They are involved in the formation of the correct three-dimensional conformation of newly synthesized polypeptides in the maintenance of functional activity of intracellular proteins and elimination of damaged proteins. Tumor same transformation is accompanied by increased synthesis of heat shock protein 27, as well as the accumulation of oxidation-modified metabolites.

The material for the study is based on the tumor cell line Jurkat (T-lymphoblastic leukemia), obtained from a bank of cell cultures Institute of Cytology RAS (St. Petersburg). Cells were cultured in the way the suspension medium containing 90% RPMI-1640, 10% fetal calf serum («Biolot», St. Petersburg), inactivated at 56°C for 30 min. Cells were maintained in logarithmic growth phase culture of continuous passages every 2–3 days. Assessment of cell viability were performed using trypan blue. Assessment of the activity of glutathione peroxidase and catalase was performed by spektrofotomitricheskim.

The results of this study showed that the addition of dexamethasone and an inhibitor of heat shock protein – KRIBB3, we received an increase in activity as glutathione peroxidase, and catalase. But in the case of co-added to the incubation medium, an inhibitor of heat shock protein 27, and dexa-

methasone, we recorded a decrease in the activity of both enzymes.

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FUNCTIONAL CONDITION OF HEART AMONG CHILDREN WITH DIFFERENT TYPES OF EATING REGIME

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An impact of a healthy lifestyle, including a type and regime of diet upon functional condition of children is studied insufficiently in age physiology and hygiene [2]. A rational diet plays an especially important part in providing for an optimal psychophysical condition of a growing organism.

Functional condition of heart was studied among pupils of 1–3rd grade with different eating regime: group 1 – children who had breakfast at school regularly (GN) and group 2 – those who did not have breakfast at school (GP). For a test strain the children kept static tension on a hand dynamometer of 1/3 of its maximum strength. In rest and during the strain, heart rate (HR) and blood pressure (BP) was measured.

The results of our study have shown that HR indexes in rest among all 1st grade boys didn't differ (table), while among the girls of GN group in the 1st grade HR in rest was reliably higher than among girls of GP group. Among 2nd grade boys of GN group HR in rest was reliably higher than that of GP group, and among girls of GP group HR in rest was the opposite – reliably higher than that of GN. In the 3rd grade HR in rest was reliably higher among pupils of GP group, compared to GN.

Changes in heart rate and blood pressure after local work of schoolchildren

Class	Sex	Before						During exercise					
		HR		BPS		BPD		HR''		BPS''		BPD''	
		I	II	I	II	I	II	I	II	I	II	I	II
1	B	88,0±3,4	89,4±2,4	89,2±2,3	86,7±2,1	64,2±1,2	52,2**±1,3	95,3±2,1	100,4±2,2	99,2±2,6	97,9±1,4	72,5±2,5	65,6**±2,1
	G	84,4±1,3	94,8±2,1	87,7±3,2	81,8**±2,0	63,8±2,1	50,1**±1,5	96,6±2,2	105,2**±2,1	97,7±3,5	94,7±2,7	70,5±2,6	62,1**±1,7
2	B	84,8±2,2	90,2±2,0	90,0±3,3	83,0**±2,1	64,2±3,3	49,0**±2,6	95,8±3,3	96,2±2,4	99,2±2,4	89,8**±2,9	70,7±1,4	61,3**±2,9
	G	92,5±6,1	84,6±1,9	86,4±2,2	82,6±2,0	66,0±1,4	51,8**±2,7	111,4±2,6	100,4**±1,9	93,5±3,3	90,6±2,1	68,5±2,3	62,8±3,0
3	B	87,5±2,3	80,4**±1,7	91,6±3,2	88,1±2,8	61,2±2,5	56,7**±2,0	92,6±3,7	95,3±1,8	104,6±2,2	92,7**±2,0	76,5±3,2	65,4**±2,1
	G	89,8±3,2	85,9**±1,5	92,8±3,4	90,5±2,6	61,7±2,4	59,5±1,9	92,8±2,8	102,7**±1,9	94,4±3,1	105,1**±2,9	70,0±2,1	68,9±2,8

Notes: B – boys, G – girls; I – GN, II – GP; ** – significant differences between I and II.

BPS indexes in rest among 1st grade boys did not differ significantly between GP and GN, and among girls of GP they were reliably higher. Among boys of GP from the 2nd grade indexes of systolic BP (BPS) were reliably higher than that of GN. In the 3rd grade BPS was higher among girls of GN than of GP. Diastolic BP (BPS) in rest among pupils of GP was higher than of GN, except for the 3rd grade girls.

Local strain caused an increase in heart beat among all children differently. Thus, in the 1st grade a reliable increase in HR was registered under tension. In the 2nd and 3rd grade among boys of GN it was less obvious than among boys of GP. Among girls of the 1st group a greater increase in HR was registered under tension than among girls of GP group.

Reaction of BPS among children of GN group of the 2nd and 3rd grade against local tension was more obvious than among children of GP group. BPD indexes under local tension among all children of GP were significantly higher, except for girls of the 3rd grade.

Thus, for primary school pupils who don't eat regularly, an increase in vascular resistance is a typical side of adaptation to school loading, as proved by indexes of BPD in rest and under a local strain. Continuous breaks and disbalance in diet can lead to disruptions in homeostasis and functional condition of organism among children and adults [1, 3]. The data of our research states an increased level in functional heart tension among children with continuous breaks between meals.

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THE ROLE OF THE FACTORS OF THE SUN ACTIVITY FOR THE STATISTICAL OF THE CARDIO – VASCULAR AND NERVOUS DISEASES IN MIDDLE LATITUDE REGION

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The present article reports results of the statistical treatment of the medical and geophysical data. A serious study of the problems of the heliobiological

relationships was first begun in [Tchizhjevsky A.L., 1930]. The investigations of the influence of the sun activity on the human organism were undertaken later in [Vladimirsky B.M., 1971].

The aim of the present article is to estimate of the influence of the heliogeophysical factors on the human health in middle latitude region. The medical data were taken from the station of the first medical aid in Murom of the Vladimir region. The geophysical data were taken from the observatory Borok in Yaroslavl region. The location of Murom corresponds to the middle geomagnetic latitude about 53°. The observatory is located on the same geomagnetic latitude 53° and on the same geomagnetic meridian 111°, which crosses Karelia and Scandinavia. Murom and Borok may be found in the projection of the plasmasphere on the Earth's surface under the specific geophysical conditions. The plasmasphere is one of the structure regions of the Earth's magnetosphere. The plasmasphere is subject to dynamics depending on the geomagnetic activity. According to [Sterlikova I.V., Ivanov A.P. 1997], the intensification of the high frequency oscillations of the magnetic field of the Earth (the high frequency geomagnetic pulsations) takes place in the plasmasphere. The medical data given in the article contains the recordings of the call time of the first medical aid in connection with sudden attack cardio-vascular and neuro diseases. Analysis is made in each variety of the following cardio-vascular diseases: chronic ischemia diseases of heart, hypertonia diseases, hypertonia crisis, stenocardia, myocardial infarction and in the each variety of the following neuro diseases: vegetative-vascular dystonia, neuro-circulatory dystonia, bronchial asthma, myoneurasthenia, mental affection, psychosis, schizophrenia, insult. The medical data were chosen in accordance with the concrete magnetic storm because of the each case of the magnetospheric substorm is individual and does not repeat, according to [Akasofu S.I., 1971]. The medical data were analysed in three time intervals: before the magnetic storm, during the magnetic storm, after the magnetic storm. The geophysical data contain the information about the magnetic storms: the time of beginning of the storm, duration of the storm, the types of the magnetic storms (recurrent or flash), their particulars. Moreover the medical data contain the information about the indexes of the geomagnetic activity and also the recordings of the geomagnetic pulsations. Only the high frequency geomagnetic pulsations (1–10 Hz), which rhythms have coincidence with the human biorhythms, were chosen from the number of the known geomagnetic pulsations originated in the magnetic storm (substorm). The recording of the irregular pulsations of types Pi1B – rPi2, Pi1B-rPiP and Pi1C are used in the article. The geomagnetic pulsations Pi1B – rPi2 represent a microstructure of the geomagnetic pulsations of the Pi2 type (the oscillations Pi2 period equal 40–150 s). They are called rider of Pi2. These