THE LEVEL OF STEROID HORMONES AND AGGRESSION IN MEN AND WOMEN OF NIZHNEKOLYMSKY DISTRICT REPUBLIC OF SAKHA (YAKUTIA)

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In the endocrine factors, an endocrine factor plays an important role in providing homeostasis and adaptation adaptations of the organism to extreme natural factors (cold, pressure drops, photoperiodism, geomagnetic disturbances, solar activity, strong winds, etc.) affecting the human body in conditions of the Far North[1,2]. Of particular interest is the study of the hypothalamic-pituitary-adrenal system. In addition to metabolic effects, steroid hormones have an effect on the central nervous system (CNS), regulating not only the neuroendocrinal function, but also behavioral and emotional processes. The ability of neurosteroids to influence both excitatory and inhibitory systems allows them to modulate a wide range of processes controlled by the central nervous system, such as thinking, sleep, perception, and emotional states: depression, anxiety, aggression [3,4]. The purpose of this study was to assess the level of steroid hormones and psychoemotional state and in the indigenous inhabitants of the Republic of Sakha (Yakutia).

Material and methods. A total of 32 somatically and mentally healthy individuals from among the indigenous small peoples of the north of the Nizhnekolymsky district at the age of 20 to 60 years were examined. The median age was 46 years. Among them 14 men (Chukchi-3, Even-7, Yukaghir-4) and 18 women (Chukchi-10, Even-6, Yukagir-1, Nenets-1). All the persons at the time of the study were relatively healthy, with no signs of acute infectious diseases transferred. Blood sampling was carried out from the ulnar vein in the morning hours from 8.00 to 11.00, on an empty stomach in the tubes of BD Vacutainer with a coagulation activator. The blood samples were centrifuged, the resulting sera were frozen at -20°C, the distribution of steroid hormones (cortisol, testosterone), neurosteroids (dehydroepiandrosterone sulfate (DHEAS), dehydroepiandrosterone (DHEA)) was performed by an enzyme immunoassay with the AlcorBio (Russia), DBC (Canada) and LDN (Germany), ELISA analyzer «Uniplan» (Pikon, Russia) on the basis of the immunopathology laboratory of the «Yakut Scientific Center of complex medical problems», Yakutsk and the laboratory of cellular and molecular biological studies of the Research Institute of Mental Health, Tomsk. For the normative values taken as specified in the instructions for the used sets. Investigation of the level of aggression was carried out by psychological examination using the Bassa-Darka questionnaire. The statistical processing of the results was carried out using the SPSS 17.0 software package for Windows.

Results. Psychological research has shown that the level of aggression is normal in 79% of men and 78% of women. Severe aggression was detected in 21% of men and 22% of women. According to preliminary data, a significant increase in cortisol levels by 33.93%, testosterone 31.92% and DHEA 45.51% in comparison with a group of men with a normal level of aggression was noted in the group of men with a pronounced aggression level. The level of DHEAS in men, both with a marked level of aggression, and with normal, varied within the limits of the norm - 2.62 (2.25-2.91) mg/ml and 1.92 (0.17-4.44) mg/ml and statistically not significantly different. Hormones DHEA and DHEAS can be synthesized by the adrenal cortex, gonad and brain cells. DHEA, unlike DHEAS, can be metabolized in the brain, and affect mental processes. An increase in DHEA is probably associated with an increase in the level of cortisol, since the effects of cortisol in the body are partially blocked by DHEA, which has a neuroprotective and stress-protective effect. The increase in DHEA is also probably associated with an increase in testosterone, since DHEA is a precursor of sex hormones. Testosterone is included in the human metabolic processes in the North, plays an anabolic role, provides plastic and reparative processes[5]. In the group of women, there were no such differences. In women with a normal and pronounced level of aggression, the concentration of hormones varied within the physiological norm, changed insignificantly and was not statistically reliable. To increase the reliability of the results obtained, additional studies are needed, the research groups are expanded.

Prospects for further research. Thus, a psychological survey showed that 78% of the surveyed indigenous people of the Nizhnekolymsky district of the Republic of Sakha (Yakutia) have a psycho-emotional state in the norm. The concentration of steroid hormones in women, depending on the level of aggression, does not change. Among men with an increased level of aggression, a higher content of cortisol, testosterone and dehydroepiandrosterone was noted.

References:
THE LEVEL OF GLUTATHIONE SYSTEM AS A MARKER OF PATHOLOGICAL PROCESSES IN LUNG CANCER PATHIENS DEPENDING ON ETHNICITY

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Currently, the appointment of most antitumor drugs is based on the statistical probability of obtaining a positive effect[4]. Medications in the human body undergo changes that directly depend on the functional state of the enzymes involved in the metabolism of drugs [3]. The effectiveness of the treatment often depends on the individual genetic characteristics of the patient[2, 1]. In this regard, we assessed the role of ethnicity in the indicators of the glutathione system in patients with lung cancer and those who do not suffer from oncopathology.

Material and Methods. A total of 50 people with lung cancer were examined, patients were admitted to the Yakut Republican Oncology Dispensary. The diagnosis of lung cancer was confirmed histologically. Patients were divided into two groups on ethnic grounds: the first group - the Yakuts, the second group - the Russians. The control group was selected taking into account age, gender and ethnicity, it included 50 people. The main criterion for selecting a control group was the absence of oncological diseases. The material of the study was venous blood, which was taken on an empty stomach from the ulnar vein. Determined using a spectrophotometer iSF-2000x: concentration-reduced glutathione, thiobarbituric acid reactive substances (TBARS); activity - glutathione reductase, glutathione-S-transferase, glutathione peroxidase. Statistical processing of results. Statistical processing of the data was carried out using the SPSS for Windows 10.0 application statistical software package.

Results. According to the data obtained by us in the group of relatively healthy people, the concentration of reduced glutathione changed depending on ethnicity: in the first group (Yakuts) - 2.50±0.05 μM/gHb, in the second group (Russians) - 2.04±0.06 μM/gHb. The level of reduced glutathione in the first group was higher by 18.4%, compared with the second group. The level of average activity of glutathione reductase in the first group was 20% higher (p<0.05) than in the second group (in the first group 7.5±0.10 μM GSSG/min*gHb, and in the second group 6.01±0.330 μM GSSG/min*gHb). We observed a decrease in the activity of glutathione-S-transferase in the first group by 9% in comparison with the second group: in the first group, the value was 2.20±0.06 μM GSH/min*gHb, in the second group - 2.42±0.03μM GSH/min*gHb. Depending on ethnicity, the activity of the enzyme in the first group was significantly higher by 35.4%: in the first group it was 6.50±0.009 μM GSH/min * gHb, in the second group it was 4.20±0.002 μM GSH/min*gHb. The level of TBARS depends on ethnicity: in the first group this indicator was 1.71±0.116 μM/L, in the second group - 1.38±0.28 μM/L. In the first group, the level of TBARS was higher by 19.3% (p<0.05).

In the group of Yakuts, higher concentrations of reduced glutathione (18%), glutathione reductase activity (20%) and glutathione peroxidase (35.4%) are noted. We also noted the intensification of free radical oxidation of lipids in Yakut organisms, as evidenced by an increase in the concentration of TBARS by 19.3%. In the organism of cancer patients, we noted a change in the parameters of the glutathione system, depending on ethnicity. The content of reduced glutathione was less in patients with Yakut ethnicity by 34.4%, in contrast to Russians, who declined only by 18.6%. A significant decrease in the concentration of the reduced form of glutathione in Yakut patients in comparison with Russians is due to the activity of glutathione reductase. Thus, the results of our study showed that in patients with lung cancer, the activity of glutathione reductase decreased by 10.5%, and in Russians it increased by 13.0%. In both groups of patients with lung cancer, we noted a decrease in the activity of the antioxidant enzyme glutathione peroxidase, in the Yakuts by 70.7%, in Russians by 52.4%. It is possible that a decrease in the enzymatic link of antioxidant protection and a decrease in the level of reduced glutathione contributes to an increase in the intensity of lipid peroxidation in patients, which is confirmed by an increase in the concentration of TBARS (Yakuts by 27.2%, Russians by 43.6%). Statistically significant differences in the activity of the enzyme involved in detoxification - glutathione-S-transferase, depending on ethnicity, were not revealed.

Prospects for further research. Thus, the results of our study showed that in patients with lung cancer, the parameters of the glutathione system vary depending on ethnicity. In the patients the concentration of reduced glutathione decreases (the Yakuts by 34.4%, Russians by 18.6%), the activity of glutathione peroxidase decreases (Yakuts by 70.7%, Russians by 52.4%). The activity of glutathione reductase in the lung cancer patients decreased by 10.5% in the Yakuts, and in Russians it increased by 13.0%. The results obtained by us testify to a significant depletion of the glutathione system in the group of oncological Yakut ethnicity.

References: