

Currently, the study of adaptation responses to rapid changes in the ambient temperature is urgent as a result of increasing number of abnormal temperature conditions in various regions of the Earth, reclamation of Antarctica and Arctic regions, mountain heights, deserts, and space. Extreme temperature conditions in these regions have a strong impact on the body, inducing stress response. The main neuroendocrine mechanism of the body reaction to various stressors is activation of the hypothalamic–pituitary–adrenal (HPA) axis, resulting in a rapid increase of glucocorticoids, which mobilize the body's structural and energy resources that are used for the subsequent forming of the systemic structural trace of adaptation [1].

To study the HPA axis activity under stress condition it is essential to investigate the concentration of adrenocorticotrophic hormone (ACTH), as it's the major stimulator of glucocorticoids release in pituitary – adrenal section. Changes in ACTH level in circulating blood indicate the degree of the HPA axis response, which makes possible to draw the conclusion about the patterns and intensity of stress response, particularly in its acute phase [2].

The aim of present study was to examine the dynamics of changes in ACTH plasma level in white mice during cold and heat exposure.

The objects of the study was white mongrel mice, weighing 20–25 g. Experimental groups were kept in a climatic chamber for 3 h at –5; 0; 35; 40 and 45 °C, and control group were kept in thermoneutral conditions. Blood sampling were done from lateral caudal vein 0,25; 0,5; 1; 2; 3 h after the beginning of exposure. Plasma ACTH level were measured via a radioimmunoassay kit (CIS ACTH-PR, France). The experiment was done taking into account the principles of bioethics and the provisions expounded in the European Convention for the Protection of Experimental Animals.

Analysis of obtained results revealed that upon exposure to –5 °C plasma ACTH level was reached the maximum 5 min after the beginning of stress (+321 %), subsequently decreased 10 min later, repeatedly increased by 30 min and returned to baseline values by 1 h. Current temperature stress leads to the death of all animals in the proper group after 2 h. A resembling dynamics were present at 0 °C, but in this case, the peak of ACTH secretion was expressed in a lesser degree (+40 %).

Under heat stress condition the following pattern is present. Upon exposure to 35 °C a significant rise of ACTH was observed after 15 min (+46 %), and later its level decreased to the baseline. During exposure to 40 °C plasma ACTH level increased by 2-fold after 15 min and repeatedly after 1 h. At 45 °C a rapid significant rise in ACTH secretion was observed, which reached the peak by 30 min (+295 %). Current temperature stress subsequently led to a sharp decrease of ACTH level and resulted in the 100 %- death of experimental animals.

Obtained results testify the fact that the degree of the HPA axis response grows up along with increasing force of the temperature factor. In addition, upon the lethal effect of temperature stress, the degree of HPA axis response rapidly increases without returning to basal activity, while exposure to weaker ambient temperature effect evokes a short-term activation of the HPA axis with a subsequent return to the basal condition. Accordingly, a contribution of non-specific adaptive reactions to forming resistance to heat and cold exposure increases along with the rising strength of temperature stimulus.

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THE INCIDENCE OF PATHOLOGIES OF A THYROID GLAND AMONG THE POPULATION OF REPUBLIC OF BELARUS

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This publication presents the analysis of statistical data of the incidence of thyroid cancer among population of the Republic of Belarus. Observed trends of increasing occurrence of pathologies of this localization, as well as decreasing mortality of patients from malignant tumors of the thyroid gland are described.

Keywords: thyroid gland, malignant neoplasms, statistics, morbidity, mortality.

Nowadays, the problem of a thyroid gland malignant remains to be in the priority due to its high occurrence among the persons of working age all over the world and, in particular, in Belarus [1].

Annually 122 thousand cases of a thyroid gland cancer are registered in the world which is 1 % of all registered cases of malignant tumors. In different regions of the world the standardized incidence indicator among 100 thousand of population fluctuates from 1,9 to 19,4 for women and from 0,8 to 5,0 for men [2].

After the Chernobyl accident and irradiation of Belarus residents with radioactive iodine, the incidence had been increasing in high gear for 20 years since 1990, and continues to remain at a high level.

During the pre-emergency period, thyroid cancer was rare in all six regions of Belarus: the average incidence rate was 1,3 per 100,000 of population [3].

On average, the incidence of thyroid cancer among adults, comparing with the pre-emergency period, increased by 3,2 times [4].

There is a confirmation of the steady growth of the cancer incidences among population provided by GLOBOCAN 2012 estimated data and real indices of the Belarusian Cancer Registry (9,1 and 9,3 respectively) [2].

In 2013 among all malignant neoplasms, the thyroid gland cancer ratio was 2,5 %.

Basing on the numerous statistical data it is to state that there is a conservation of the thyroid gland pathologies growth in Republic of Belarus due to the Chernobyl accident consequences.

The number of new diagnosed cases of thyroid pathologies for the period of 2013 was 1092. According to data of the register, 65,5 % of cases from this number, have been registered at early stages. 94,4 % of them were detected during preventive examinations. 2,1 % of the diseased had been leaving for less than a year [2].

Mortality ratio from a thyroid gland malignant neoplasm is at a low level; in 2013 it was 0,6 cases on 100000 of population and has slightly decreased in 10 years. The same tendency occurred in the ratio of mortality to the number of incidences, it has decreased from 6,6 to 5,2 % [2]. The decline in mortality due to the pathology of this localization can be explained by increased level of medicine and existence of more perfect early identification and treatment of diseases of a thyroid gland.

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FACTORS OF INFORMATION ENVIRONMENT IN THE ASPECT OF ECOLOGICAL MEDICINE AND PSYCHOLOGY

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The article analyzes the relevance of studying the information environment in the context of medicine, ecology and psychology.

Keywords: media environment, information environment, medical ecology, technosphere, noosphere, environmental factors, information ecology.

Medical ecology studies the influence of the environment on a person. In the aspect close to media ecology, we consider the impact of a new environment called information, or media environment, on a person. What is the information environment?