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Short Communication

A New Method of Eustress by Physiological Activation of the Hypothalamic-Pituitary System of the Body

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The stress response system is a vital aspect of the dynamics of an individual's health/illness at the physical, psychological and social levels.

This extremely complex self-regulating system includes many causal factors, non-linearities and time delays. The underlying physiological response to stress involves three main mechanisms: the autonomic nervous system, the hormonal system, and the immune response system. To create a model of mild stress (in our understanding, eustress) seemed very important and at the same time such stress should be beneficial for the body [1-3]. We propose a method of physiological influence on the vegetative-hormonal system. We believe that eustress is a physiological condition and necessary for maintaining health.

However, in order for it to have a positive effect on the body, it is impossible to allow the transition of stress into a more severe and prolonged stage, otherwise the positive aspects of this state will turn into negative ones.

The use of physiological stress trains the neuro-endocrine system and the body more easily tolerates the more difficult stressful situation encountered. Eustress increases the body's resistance and trains its defense mechanisms. With a stress reaction of the body, endocrine tissues are tested and numerous hormones are released into the blood: hypothalamic-pituitary system, adrenal glands, thyroid gland. Among these hormones are endorphins. Endorphins lift a person 's mood. It is to increase endorphins that a person engages in various types of simple and extreme sports.

The positive effects of eustress can be as follows: the immune system is activated, moderate nervous tension helps the immune system to be in good shape and cope with infections and viruses. The benefit of short-term dosed stress is that it has a positive effect on the body's immune response during vaccination, therefore, the protective effect of vaccination is prolonged. Mild stress helps patients during postoperative rehabilitation. Eustress increases physical strength, raises the level of efficiency and endurance, mobilizes internal capabilities and hidden reserves of the body, improves memory, improves the quality of thinking, makes you think quickly and efficiently. It helps to lose weight due to increased energy consumption (of course, this is only useful for those who have extra pounds and are trying to lose weight). Eustress also accelerates metabolism [4,5].

The aim of the study is to develop a physiological method of stimulating the hypothalamic-pituitary system (HGS) of the body, to increase and train the adaptive capabilities of a person. This goal is achieved by using cold air inhaled through the nose as an activating stimulus with the direction of the air flow upward to the frontal sinuses and the base of the brain, with the tongue pressed to the palate during inhalation, at ambient temperatures from +4 to -20 degrees C or using a special air cooling device in a warm climate.

The method is carried out as follows. In winter, the optimal temperature of the inhaled air should be +4 and below degrees C. In summer, it becomes necessary to use a special air cooling device that cools the air to the specified temperature. The subject, the patient inhales through his nose, trying to direct the jet upward to the frontal sinuses and to the base of the brain with a delay at the height of inspiration for 4-5 seconds, while the tongue is tightly pressed to the palate. After the specified time, the subject exhales. This cycle is repeated for 10-15 minutes, and 2-3 times during the day. A person can do this simply while walking.

Concentrations of adrenocorticotropic (ACTH), thyroid-stimulating (TSH) and somatotropic (STH) hormones in the blood were studied to prove the effect of stimulation of HGS. Blood sampling was carried out at 9-11 a.m. before and after the breathing session. The studies were conducted on 32 volunteers aged 23-48 years. As studies have shown, reliable results have been obtained confirming the effect of stimulating the secretion of these hormones. These data are given in the table.

The concentration of hormones before and after the session of breathing with cooled air.

The stage of the study	The concentration of hormones		
	TTG MME/l	STG, ng/ml	ACTH, PMOL/L
Before the start of the session	0.43 ± 0.04	2.1 ± 0.1	10.2± 0.8
After the session	1,82 ± 0,07***	5,2± 0,2***	16,4± 0,7***

Table 1

Note: ***p < 0.001-reliability of indicators between the 1st and 2nd stage of the study.

For all the studied hormones, highly reliable results were obtained confirming an increase in the concentration of ACTH, TSH, STH in venous blood under the influence of breathing cooled air by the proposed method of inhalation.

Example 1. The subject S., 42 years old. Blood was taken through a catheter inserted into the cubital vein. A breathing session with an air temperature of - 5 degrees C was 10 minutes. After the end of the session, a second blood sampling was performed. The concentration of hormones in the blood before the session was:ACTH-8,0 pmol/l, TSH-0,30 mME/l,STG-2,7 ng/ml. After the session, the concentration was respectively: 18.0 pmol/l, 1.2 mMU/l, STG-6.3 ng/ml. After the session, the concentration of the studied hormones increased significantly.

Example 2. The subject N., 38 years old. Blood was taken from a vein. For 15 minutes, the examinee breathes cooled air through the nose at a room temperature (minus) - 8 degrees C. After the session, blood was re-drawn from the vein.

The concentration of hormones ACTH, TSH, STH, respectively, was:

- Before the session -12.2 pmol/l; 0.8 mMU/l; 3.2 ng/ml;
- After the session-18.0 pmol/l; 1.8 mME/l; 6.0ng/ml.

As a result of the sessions of cryocranial stimulation of HGS, there is an increase in the level of hormones of the anterior pituitary gland and elements of a stress reaction with an improvement in human well-being.

The proposed method is applicable for physiological stimulation of the hypothalamic-pituitary system, which can be used to increase adaptive capabilities, preserve health and prolong human life.

Greenhouse life ages the body more than life under the influence of training factors that are strong enough, but do not carry diseases, such as, for example, daily pouring with cold water, optimal physical activity, periodic fasting and the proposed directed inhalation of cold air, which is completely unusual for a modern household person.

Stress exposure is a kind of factor in the selection of viable elements at the body level. Stress should not be categorically avoided, stress should be used for prevention and therapy. It is possible to recommend all people to strengthen their health in winter to use this method, and those who live in non-winter territories must visit at least once a year places where there is a sub-zero temperature [6].

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