MECHANISMS OF THE ENDOCANNABIONOID SYSTEM AFFECTS THE PAIN ADAPTATION PROCESSES TO VIGOROUS PHYSICAL ACTIVITY IN HUMANS

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Introduction. Adaptation system is a complex of humoral and metabolic transformations occurring in organism in response to environmental conditions changes. The organism's adaptation to pain during the vigorous physical activity is carried out by using stress-limiting system, which is represented in central nervous system mainly by opioid system mediators. Recently, endocannabinoids (anandamide, 2-arachidonoyl glycerol) are also referred to as stress-limiting mediators with antinociceptive activity. Endocannabinoids are the endogenous neurotransmitters with lipid properties that have the characteristic of retrograde signaling (from the presynaptic membrane to synaptic), which blocks the transmission of nerve impulses. The **aim** of this work was the theoretical study of mechanisms by which the endocannabinoid system affects the pain adaptation processes during the vigorous physical activity in humans.

Dicsussion. It is known that physical activity is accompanied by a proportional increase in the blood epinephrine level (stress-inducing hormone), which leads to increased blood pressure (BP), ascending blood glucose levels and activation of glycolysis in muscles. In terms of relative hypoxia caused by epinephrine and intensive muscle work, tissue receives the energy as a result of anaerobic glycolysis, which causes the lactic acid accumulation and the development of muscle pain. According to recent studies, pain can also be caused by microtraumas formed during the excessive stretching of myofibrils. In response to the increased levels of adrenaline the stress-limiting system is activated that is accompanied with the release of endorphins and endocannabinoids. Several studies have noted a functional synergy in the work of these two types of neurotransmitters, which can be explained by different mechanisms of action. Endorphins, similar to morphine-like substances, stimulate opioid receptors and cause analgesia. 2 Arachidonoyl glycerol through retrograde signaling mechanism inhibits the afferent nerve impulse transmission, which also reduces the sensation of pain. It is also important to note a psychoactive activity of endocannabinoids and endorphins, so against the background of physical activity athletes feel euphoria, which is called "runner's euphoria".

Conclusions. Thus it shows that endocannabinoids are important in the body's adaptation to stress-induced muscle pain during vigorous physical activity. The role of other neurotransmitters in the stress-limiting system requires further research.