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Reactivity of the Reproductive System During Physical Activity

Bobokandova Mekhriniso Fazliddinovna

Samarkand State Medical University

Abstract: Hormones play a very important role in the functioning of the human body. These substances stimulate the activity of certain cells and systems of the body. Hormones are produced by endocrine glands and certain tissues. Among the wide range of hormones, anabolic and catabolic hormones are of particular importance. Catabolism is the process of metabolic breakdown of cells and tissues, as well as the breakdown of complex structures with the release of energy in the form of heat or in the form of adenosine triphosphate. Catabolic processes provide a large amount of energy. Anabolic processes are the opposite of catabolic processes. Anabolic processes refer to the processes of creating cells and tissues, as well as substances necessary for the functioning of the body. Regenerative processes and anabolism of muscle tissue largely depend on the level of growth hormone, insulin and testosterone in the blood plasma. Physical activity significantly increases the concentration of many hormones in the blood plasma, and not only immediately during exercise. From the beginning of exercise (for example, close to maximum power), in the first 4-10 minutes, the concentration of various hormones and metabolic products changes spontaneously. Thus, with the start of exercise, the concentration of lactic acid in the blood increases. And the concentration of glucose begins to change inversely with the concentration of lactic acid. The level of somatotropin in the blood increases with the increase in the time of physical exercise.

Key words: Physical stress, physical activity, reproductive health, effect of physical activity on reproductive health.

Other studies have shown that in older people (65-75 years old), testosterone levels increased by 40% after cycling. According to gerontologists, the maintenance of normal testosterone concentrations ensures a cheerful, energetic state in old age and possibly increases life expectancy.

The secretion of hormones and their release into the blood during exercise can be expressed as a cascade of reactions. As stress, physical exertion causes the release of liberins in the brain structures, which, in turn, stimulate the production of tropins in the pituitary gland. Pathways enter the endocrine glands through the blood, where hormones are released.

Catabolism is related to the presence of many factors related to the release of energy in the blood. One of these factors is cortisol. This hormone helps with stress. However, a very high level of cortisol is undesirable: the breakdown of muscle cells begins and the supply of amino acids to them is disturbed. Under such conditions, when proteins enter the body, they obviously cannot

participate in anabolism, but are intensively excreted in the urine or converted into glucose by the liver. Another negative role of cortisol is manifested in its effect on the saccharide metabolism during the rest period after training, when the athlete wants to quickly recover his strength. Cortisol prevents the accumulation of glycogen in muscle tissue. Unfortunately, cortisol is produced in the human body during strenuous exercise. Vigorous training and high physical activity are all stress. Cortisol plays one of the main roles during stress.

The catabolic effects of cortisol can be reversed by the use of anabolic steroids. But this method is very harmful to health. The side effects are so dangerous that the athlete must find other effective anabolic steroids that are legal and do not cause side effects. As a result of the anabolic activity of insulin, the body that receives a large amount of carbohydrates also helps to recover quickly. It turns out that the effect in this case is achieved by inhibiting the activity of cortisol. The concentration of insulin is inversely proportional to the concentration of cortisol in the blood. Insulin is a polypeptide hormone that plays an important role in bridging energy pathways. Insulin anabolism affects muscle, adipose tissue and liver. Insulin stimulates the formation of glycogen, aliphatic acids and proteins. Insulin also accelerates glycolysis.

The mechanism of insulin anabolism consists in accelerating the entry of glucose and free amino acids into cells. However, the processes of glycogen formation activated by insulin lead to a decrease in the concentration of glucose in the blood (the main sign of hypoglycemia). Insulin slows down catabolism in the body, including. breakdown of glycogen and neutral fat. Acceleration of anabolism in the body, which most bodybuilders desire, is possible without the use of doping agents such as anabolic steroids.

One of the most important agents that activates protein production is prohormone - somatomedin C. Experts say that the formation of this substance is stimulated by somatotropin and occurs in liver and muscle tissue. The production of somatomedin C depends to some extent on the amount of amino acids received by the body. Post-workout anabolic hormones serve a different purpose. As a result of research, it was found that muscle fibers are damaged during physical activity. In specially prepared samples of muscle tissue under the microscope, you can often see tears and complete rupture of muscle fibers. There are several factors for such a destructive load effect. The first hypotheses of experts were related to the destructive effects of catabolic hormones. Later, the destructive effect of free oxidants was also proven.

The endocrine system controls all types of metabolism and, depending on the situation, can activate the body's reserve forces. It also controls recovery after strenuous exercise. In addition, the reactions of the hormonal systems are very different depending on the load level (high or medium power).

With moderate-intensity load and long training, growth hormone and cortisol levels increase, insulin levels decrease, and triiodothyronine levels increase.

High-intensity exercise is accompanied by an increase in the concentration of growth hormone, cortisol, insulin and T3. Growth hormone and cortisol determine the development of special indicators, and therefore, the increase in their concentration during various training periods is accompanied by an improvement in the athlete's sports performance.

Numerous studies by experts have found that professional ultra-distance runners at rest have low or normal concentrations of growth hormone. However, during a marathon race, the level of growth hormone in the blood increases greatly, which allows for high performance for a long time. Growth hormone (somatotropin) is a hormone responsible for anabolism in the body (growth, development, weight gain in the body and various organs). In an adult organism, the effect of growth hormone on growth functions is largely lost, but it remains on anabolic functions (protein formation, saccharide and fat metabolism). This is the reason why growth hormone is banned as a doping agent.

Another important adaptation hormone is cortisol, which is responsible for saccharide and protein metabolism. Cortisol controls liver function through a catabolic process that supplies glycogen and ketogenic amino acids. Along with the catabolic process (stopping the production of proteins in lymphoid and connective tissues), the concentration of glucose in the blood plasma of the athlete is sufficiently maintained. This hormone is also banned as doping. Insulin controls the concentration of glucose and its movement across muscle and other cell membranes. A normal insulin level is 5-20 mcd/ml. Lack of insulin reduces performance due to a decrease in the amount of glucose delivered to the cells.

Insulin release is stimulated by high-intensity exercise, which makes cell membranes more permeable to glucose (glycolysis is stimulated). Efficiency is achieved through the metabolism of saccharides. At moderate exercise intensity, insulin levels decrease, which leads to a shift from saccharide metabolism to lipid metabolism, which is highly demanded during long-term physical activity, when glycogen reserves are partially used.

Thyroid hormones thyroxine and triiodothyronine control basal metabolism, oxygen consumption, and oxidative phosphorylation. Changes in the level of thyroid hormones determine the limits of human performance and endurance (an imbalance between oxygen production and phosphorylation occurs, oxidative phosphorylation in muscle cell mitochondria slows down, and adenosine triphosphate resynthesis slows down). The results of a study of ultra distance runners showed a correlation between growth hormone and cortisol ratio.

Examining the endocrine system of a particular athlete allows us to determine his capabilities and readiness to withstand physical activity with the best performance. Another important aspect of predicting specific performance is determining the ability of the adrenal cortex to produce cortisol in response to irritation with adrenocorticotropic hormone. Increased cortisol production indicates an athlete's ability to perform optimally.

Sports performance of different sexes is significantly dependent on testosterone. This hormone determines aggressiveness, temperament, and determination to perform a task. Hormonal drugs (testosterone and its modifications, anabolic steroids, growth hormone, corticotropin, gonadotropin hormone, erythropoietin) artificially increase human performance and are therefore considered doping and their use in competitions and training is prohibited.

Often, the use of hormones contradicts a healthy lifestyle and can eventually lead to serious pathologies.

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