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Abstract: *The endocrine system plays an important role in the regulation of body functions. The organs of this system - the endocrine glands - secrete special substances that have a significant and specialized effect on the metabolism, structure and function of organs and tissues. Endocrine glands differ from other glands that have excretory ducts (exocrine glands) in that they secrete the substances they produce directly into the blood.*

Keywords: *pituitary gland, pineal gland, pancreas, thyroid gland, adrenal glands, genital, parathyroid or parathyroid glands, thymus (goiter) gland,*

The endocrine glands are functionally closely related to each other, and the defeat of one gland causes a dysfunction of other glands.

Hormones. Specific active substances produced by the endocrine glands are called hormones (from the Greek horman - to excite). Hormones have a high biological activity.

Hormones are relatively quickly destroyed by tissues, therefore, to ensure a long-term effect, their constant release into the blood is necessary. Only in this case it is possible to maintain a constant concentration of hormones in the blood. Hormones act on metabolism, regulate cellular activity, promote the penetration of metabolic products through cell membranes. Hormones affect respiration, circulation, digestion, excretion; reproductive function is associated with hormones.

The growth and development of the body, the change of different age periods are associated with the activity of the endocrine glands.

The pituitary gland is a small oval-shaped formation located at the base of the brain in the deepening of the Turkish saddle of the main bone of the skull.

There are anterior, intermediate and posterior lobes of the pituitary gland. According to the International Anatomical Nomenclature, the anterior and intermediate lobe is called the adenohypophysis, and the posterior lobe is called the neurohypophysis.

Under the influence of releasing factors, tropic hormones are released in the anterior pituitary gland: somatotropic, thyrotropic, adrenocorticotropic, gonadotropic.

Endocrine glands include: pituitary gland, pineal gland, pancreas, thyroid gland, adrenal glands, genital, parathyroid or parathyroid glands, thymus (goiter) gland. The human endocrine glands are small in size, have a very small mass (from fractions of a gram to several grams), and are richly supplied with blood vessels. Blood brings to them the necessary building material and carries away chemically active secrets. An extensive network of nerve fibers approaches the endocrine glands, their activity is constantly controlled by the nervous system.

Somatotropin, or growth hormone, causes the growth of bones in length, accelerates metabolic processes, which leads to increased growth, an increase in body weight. The lack of this hormone is manifested in short stature (height below 130 cm), delayed sexual development; body proportions are preserved. An excess of growth hormones in childhood leads to gigantism. The medical literature describes giants who had a height of 2 m 83 cm or even more (3 m 20 cm). impossible. Then acromegaly develops: the hands and feet increase, the bones of the facial part of the skull (they ossify later), the nose, lips, chin, tongue, ears grow intensively, the vocal cords thicken, which makes the voice rough; the volume of the heart, liver, gastrointestinal tract increases.

Adrenocorticotrophic hormone (ACTH) affects the activity of the adrenal cortex. An increase in the amount of ACTH in the blood causes hyperfunction of the adrenal cortex, which leads to metabolic disorders, an increase in the amount of sugar in the blood. Itsenko-Cushing's disease develops with characteristic obesity of the face and trunk, excessively growing hair on the face and trunk; often at the same time, women grow a beard and mustache; blood pressure rises; bone tissue is loosened, which sometimes leads to spontaneous bone fractures.

The adenohypophysis also produces a hormone necessary for the normal function of the thyroid gland (thyrotropin).

Several anterior pituitary hormones affect the function of the gonads. These are gonadotropic hormones. Some of them stimulate the growth and maturation of follicles in the ovaries (follicle-stimulating hormone), activate spermatogenesis. Under the influence of luteinizing hormone, women ovulate and form a corpus luteum; in men, it stimulates the production of testosterone. Prolactin affects the production of milk in the mammary glands; with its deficiency, milk production decreases.

Of the hormones of the intermediate lobe of the pituitary gland, the most studied is the melanophoric hormone, or melanotropin, which regulates the color of the skin. This hormone acts on skin cells that contain pigment granules. Under the influence of the hormone, these grains spread throughout all the processes of the cell, as a result of which the skin darkens. With a lack of a hormone, colored pigment grains gather in the center of the cells, the skin turns pale.

During pregnancy, the content of melanophoric hormone in the blood increases, which causes increased pigmentation of certain areas of the skin (pregnancy spots).

Under the influence of the hypothalamus, the hormones antidiuretin, or vasopressin, and oxytocin are secreted from the posterior pituitary gland. Oxytocin stimulates the smooth muscles of the uterus during childbirth.

It also has a stimulating effect on the secretion of milk from the mammary glands.

The most complex action has a hormone of the posterior pituitary gland, called antidiuretic (ADH); it enhances the reabsorption of water from the primary urine, and also affects the salt composition of the blood. With a decrease in the amount of ADH in the blood, diabetes insipidus (diabetes insipidus) occurs, in which up to 10-20 liters of urine are separated per day. Together with the hormones of the adrenal cortex, ADH regulates the water-salt metabolism in the body.

The structure and function of the pituitary gland undergo significant changes with age. In a newborn, the mass of the pituitary gland is 0.1-0.15 g, by the age of 10 it reaches 0.3 g (in adults -0.55-0.65 g).

In the period preceding puberty, the secretion of gonadotropic hormones is significantly increased, reaching a maximum during puberty.

The adrenal glands are a paired organ; they are located in the form of small bodies above the kidneys. The mass of each of them is 8-30 g. Each adrenal gland consists of two layers of different origin, different structure and different functions: outer - cortical and inner - cerebral. More than 40 substances belonging to the group of steroids have been isolated from the cortical layer of the adrenal glands. These are corticosteroids or corticoids. There are three main groups of hormones of the adrenal cortex: a) glucocorticoids - hormones that act on metabolism, especially carbohydrate metabolism. These include hydrocortisone, cortisone, and corticosterone. The ability of glucocorticoids to suppress the formation of immune bodies was noted, which gave reason to use them in organ transplantation (heart, kidneys). Glucocorticoids have an anti-inflammatory effect, reduce hypersensitivity to certain substances;

b) mineralocorticoids. They regulate mainly mineral and water metabolism. The hormone of this group is aldosterone. c) androgens and estrogens are analogues of male and female sex hormones. These hormones are less active than the hormones of the sex glands and are produced in small quantities.

The adrenal glands from the first weeks of life are characterized by rapid structural transformations. The development of the adrenal cortex proceeds intensively in the first years of a child's life. By the age of 7, its width reaches 881 microns, at the age of 14 it is 1003.6 microns. The adrenal medulla at the time of birth is represented by immature nerve cells. They quickly differentiate during the first years of life into mature cells, called chromophilic, as they are distinguished by the ability to stain yellow with chromium salts. These cells synthesize hormones, the action of which has much in common with the sympathetic nervous system - catecholamines (adrenaline and norepinephrine). Synthesized catecholamines are contained in the medulla in the form of

granules, from which they are released under the action of appropriate stimuli and enter the venous blood flowing from the adrenal cortex and passing through the medulla. Stimuli for the entry of catecholamines into the blood are excitation, irritation of sympathetic nerves, physical activity, cooling, etc. The main hormone of the medulla is adrenaline, it makes up approximately 80% of the hormones synthesized in this section of the adrenal glands. Adrenaline is known as one of the fastest acting hormones. It accelerates the circulation of blood, strengthens and speeds up heart contractions; improves pulmonary respiration, expands the bronchi; increases the breakdown of glycogen in the liver, the release of sugar into the blood; enhances muscle contraction, reduces their fatigue, etc. All these effects of adrenaline lead to one common result - the mobilization of all the forces of the body for hard work. Increased secretion of adrenaline is one of the most important mechanisms of restructuring in the functioning of the body in extreme situations, during emotional stress, sudden physical exertion, and cooling.

A significant increase in the functional stress of the adrenal glands is observed by the age of 6 and during puberty. At the same time, the content of steroid hormones and catecholamines in the blood increases significantly.

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