International Journal Of Management And Economics Fundamental

VOLUME Vol.05 Issue 04 2025
PAGE NO. 64-67
DOI 10.37547/ijmef/Volume05Issue04-10

The Role of Medical Technologies in The Treatment of Endocrine Glands

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Received: 26 February 2025; **Accepted:** 21 March 2025; **Published:** 25 April 2025

Abstract: This article is devoted to the structure and function of secretory glands. They are distinguished based on the anatomical structure of the thyroid gland, pituitary gland, individual glands and their functions.

Keywords: Thymus, glandular gland, capsular fibrosis, ectoderm, acromegaly.

Introduction: Currently, the medical industry is developing consistently, and innovative technologies play an important role for maintaining human health and early detection of diseases. Diseases related to the internal secretory glands - diabetes mellitus, thyroid dysfunctions, problems related to the adrenal glands and pituitary gland - are widespread among the population, and their effective treatment has been significantly improved with the help of modern technologies. In recent years, the detection and treatment process for these types of diseases has become much simpler and faster, using ultrasound, magnetic resonance imaging (MRI), laboratory diagnostic equipment, as well as analysis programs powered by artificial intelligence. At the same time, advanced devices such as insulin pumps and hormone monitoring devices play an important role in improving the quality of life of patients. The article pays special attention to the role of medical technologies, their possibilities and practical application in the treatment of diseases of the endocriminated glands.

METHOD

The endocrine glands are one of the most important structures in the human body that provide hormonal balance. Hormones produced by these glands control all the main processes in the body - growth, development, metabolism, reproductive functions, psychoemotional state and many other systems. The internal secretory system includes the pituitary, thyroid gland, parathyroid glands, adrenal glands, the endocrine part of the pancreas, and the sex glands. When the activity of these glands is disrupted, a number of endocrine diseases occur. In particular, such as diabetes mellitus, cases of hypothyroidism or hyperthyroidism, adrenal insufficiency (Addison's disease), excessive hormone production (Cushing's syndrome), hormonal tumors and other disorders have a serious impact on human health. Currently, these diseases are widespread throughout the world, where their early detection and effective treatment is carried out using modern medical technologies.

Modern diagnostic tools play a huge role in the early detection of endocrine diseases. For example, it is possible to accurately measure the amount of hormones in the blood serum through laboratory tests, to see the structure of the thyroid gland by ultrasound, to determine the presence of a tumor in the pituitary or adrenal glands using magnetic resonance imaging (MRI) and computed tomography (CT). Hereditary endocrine syndromes are also detected with the help of genetic tests. And this plays an important role in the prevention of disease. The technologies used in the treatment of endocrine diseases are also updated and improved every year. For example, an insulin pump

designed for patients with diabetes delivers the hormone to the body at the right time and in the right amount. And through continuous glucose monitoring (CGM), the patient can monitor the level of glucose in their blood in real time. Software developed on the basis of artificial intelligence analyzes patients' laboratory analyses and offers the doctor the optimal treatment plan. Telemedicine services are also becoming more important for patients with endocrine diseases. Patients living in remote regions have the opportunity to consult remotely with experienced specialists. This serves to streamline the treatment process and improve control. In conclusion, the role of modern medical technologies in the detection and treatment of diseases of the endocrine glands is invaluable. The close cooperation of science and technology serves as an important tool for the effective fight against these diseases. The internal secretory glands differ from the external secretory glands in that they do not have secretory tubes in themselves. The secretion (hormone) processed in the internal secretory glands is absorbed directly into the blood. Therefore, such glands are also called endocrine glands. The internal secretory glands are arranged in different parts of the human body, and they are supplied with a large number of blood vessels depending on their function (although they are small in size). For example, if blood comes to the adrenal gland through three pairs of blood vessels, four to five blood vessels enter the thyroid gland. At the same time, too many nerve fibers innervate the endocrine glands. They are connected with the centers that control the endocrine glands. Thus, on the one hand, the function of the endocrine glands is controlled by the nervous system, and on the other hand, hormones absorbed into the blood, in turn, affect the nervous system. Internal secretion glands are diverse. Therefore, it is desirable to call it neurogumoral regulation, rather than hormonal regulation of body functions. For normal functioning of the body, hormones must be contained in the blood in a certain quantity. The state of decrease in the amount of hormones in the blood is called hypofunction, during which various diseases occur. Hormones spread throughout the body in the blood, showing their effect on this or that process. The thyroid gland (glandula thyroidea) is an odd gland, located in the cervical area with the thyroid ring of the hiccup in front of the 3-4 ring above the cartilage. The goat-shaped gland is 30-50 g in adult individuals and 1.8-2.5 g in babies. In the subsequent growth periods of babies, the scales are enlarged to 10-15 g. With old age, it gradually decreases in size. But the size and size of the gland is different in people with bull-disease, that is, when it grows, the weight is even 1-1.5 kg. The right (lobus dexter) and left (lobus sinister) fragments of the thyroid gland, the intermediate part is joined together through the neck (isthmus gl. thyroidei). About 25-30 percent of people have a pyramidal fragment of the gland (lobus pyramidalis), located upwards from the neck. Tumors (trabecles) that grow out of the fibrous membrane that surrounds the gland (capsula fibrosa) divide the gland into fragments. The gland fragments are made up of bubble follicles, the inner surface of which is covered with domed cells. The composition of follicles is a thick colloidal substance, containing iodine-rich amino acids, protein. The composition of iodine in the gland exceeds the composition of blood plasma by more than 300 times. The surface of the gland is covered with vascular nets and nerve rings (stray nerve fibers). The organ cells of the thyroid gland (glandula parathyroidea) are four, sometimes five, and lie adhering to the posterior surface of the thyroid gland side segments as two pairs of glandula parathyroidea superior (a pair, a pair of glandula parathyroidea inferior). The glands, which are the smallest inside the endocrine glands, are about 6 mm long, 4 mm wide, and 2 mm thick. Each gland is surrounded by a membrane rich in blood vessels. Hormones perform the metabolism of calcium and phosphorus. The discrete gland (bull gland, thymus) is made up of two pieces (lobus dexter - right and lobus sinister - left piece) and are joined together by connective tissue. The gland is located at the top of the thorax (behind the pelvic bone) between the right and left mediastinal pleura. The upper, acute part of the gland protrudes from the cervical anterior fascia (1-1.5 cm in children) and is located behind the obsolete and obsolete muscles. The anterior surface of the discrete gland is concave and is located in the buttocks of the pelvic bone and partly behind the body (ribs I-IV at the pelvic level). Behind the gland are located the upper part of the pericardium, the aorta and pulmonary staples, the aorta and large vessels extending from it, the left shoulder and the superior pelvic veins. The discrete gland is surrounded from the outside by a capsule (capsula thymi) consisting of thin thin connective tissue, through which a number of barriers (septa interlobulares) pass into the gland and divide the gland parenchyma into small pieces. The outer part of each fragment consists of the cortex thymi, dark in color, and the central part of the cortex thymi (medulla thymi) is light. One of the distinguishing features of the discrete gland is formed at the base of the fragments by two types of narrow - epithelial and reticular. In this narrow are lymphocytes (here also called thymocytes), which are somewhat more in quantity than in the crustal substance. That's why it's dark. In the center of the gland fragments is located a consistently located swarm of squamous epithelial cells - thymus cells (corpusculum thymi or Gassal cells). The discrete gland develops as a pair of growths in embryonic progression,

mainly from the III jaw pockets. Thymus buds grow and grow towards the caudal, stretch and converge with each other. A thin, long, upper part of the bud, called the "ductus thymopharyngeus", gradually develops either or a separate gland from the bottom. At the 5th month of embryonic development, it can be seen that the discrete gland consists of several lobes. The mass of the gland varies with age. In particular, in a newborn fry it gets 12 g, before puberty in the amount of 30-40 g. Upon puberty, the gland gradually begins to shrink again. At the age of 25, it grows to 25-30g, at 60-70 years it twists and becomes 6-15g and becomes adipose tissue, but does not disappear completely, remaining behind the pelvic bone like tiny islands. The lower posterior of the brain (hypophysis - pituitary) is a small (weight 0.3-0.5 g) gland of an oval shape, which hangs down on the cerebral base, the voroncasymon leg. The gland is located in the recess of the Turkish saddle of the pelvis of the pelvis. The lower back of the brain consists of the anterior and posterior sections. The anterior fragment of the gland is made up of gland epithelial cells, and therefore it is also called the adenohypophysis (adenohypophysis grows from ectoderm). The posterior fragment of the gland (neurohypophysis) grows lumpy from the bottom of the III ventricle below the forebrain. Therefore, in the back of the gland, nerve tissue elements are found. Somatotropic, prolactin, adrenocorticotropic, gonadotropic hormones developed from the previous part affect various functions of the body. In particular, the somatotropic hormone influences the overall growth of the body. If the somatotropic hormone is overexposed, a person may overgrow (acromegaly). The hormone prolactin increases the release of milk from the nipples and affects the activity of the yellow body in the female ovary. Adrenocorticotropic hormone affects the activity of the lining part of the adrenal gland, increasing the release of hormone from it. Gonadotropic hormone activates the function of the sex glands (ovary, testicle). The hormone, which is secreted from cells located on the back of the anterior part of the gland, affects the color of human skin. The hormones that are released from the posterior part of the gland are actually separated from the bottom of the visual cortex and travel down through the ventricular leg and accumulate in the gland. The hormone passes from the gland to the blood, accelerating the reabsorption of urine in the kidney tubes, increases uterine contraction, the release of milk from the nipples (when a baby sucks). The extraordinarial body (corpus pineale or epiphysis cerebri, posterior cerebri) is a circular gland of moshdek (0.2 g in weight) located between two dormitories in the brain, and is attached to the optic dome (comissura habenularum) by means of jubilees. The gland is divided into fragments with membrane growths (trabeculae) surrounding it. If the gland in newborns is 7-10 mg, then by the age of 10 years its weight almost doubles. During old age, lime material accumulates in the gland. The pineal hormone normalizes the development of the sex glands. If the gland activity slows down, the sex glands develop faster, and girls and boys reach puberty earlier. The surplus gland develops from the crown of the III ventricle. The adrenal gland (glandula suprarenalis) is a cap-shaped, located above the right and left kidneys, in which the anterior (fascies anterior), posterior (fascies posterior) and inferior (fascies renalis) surfaces are distinguished. The weight of the gland is 3-5 g. Disambiguation pages with short descriptions And the growths that come out of the membrane that cover the gland divide it into several fragments. The gland is made up of the yellowish cortex (cortex) and the dark brain (medulla), which is located on the inside. The crustal part and the brain part differ from each other in terms of structure, development and the work it does. If the weight of the gland in newborns is 3-4 g, then by the age of 8-10 years it increases in size 1-1.5 times, and by the age of 20 years the gland weight is on average 11-13 g. With age, the size of the gland gradually begins to decrease. The pelvic floor consists of three areas that develop from the mesoderm and arise from vascular and nerve-rich epithelial cells that produce various hormones. If the hormone aldosterone, which is produced by this part of the gland, affects the process of water-salt metabolism in the body, the hormone hydrocortisone participates in the process of protein, fat and carbohydrate metabolism, increases the body's resistance to diseases, provides rapid healing of inflammation. And sex hormones that are made in the gland affect the sex glands. With a decrease in the activity of the adrenal gland, the body's ability to resist various diseases also decreases, causing even disease (human skin becomes bronze-colored). On the contrary, when the function of the porous part of the gland increases, the hormone production activity of the sex glands increases, and adolescents reach puberty faster. The brain part of the gland develops from the ectoderm (where the sympathetic nodes grow). This part is called the adrenaline or chromaffin system. The cerebral part of the gland processes the hormones adrenaline and noradrenaline. Adrenaline increases the contraction activity of the heart, accommodates blood vessels. It reduces the ability of the intestinal walls to compact (intestinal peristalsis). Expands the bronchi. Innervation: N.splanchnicus major plexus coeliacus. Blood vessels: a.suprarenalis superior (a. phrenica inferior), media (aorta abdominalis) et inferior (a.renalis). So, the internal secretory glands are an organismal system involved in the management of the body through special hormones that it produces.

Hormones produced by the internal secretory glands go out into the bloodstream and spread throughout the body.

Relevancy of the subject

The endocrine glands are one of the important structures that ensure the hormonal balance of the body. Disruptions in the work of these glands are the cause of many chronic diseases - in particular, diabetes mellitus, hypothyroidism, hyperparathyroidism, adrenal insufficiency. Today, these diseases are very common not only among adults, but also among children and adolescents, which requires effective measures for their early detection, treatment and prevention. The development of modern medical technologies makes it possible to detect these diseases at an early stage and to treat them from an individual approach. For example, diagnostic programs based on genetic and biochemical analysis, long-term hormone monitoring, digital medicine, and artificial intelligence play a major role in improving the quality and accuracy of treatment. In this context, the role of modern medical technologies in the treatment of diseases of the endosecretory glands is of great importance, and every year the scientific and practical significance of this topic is increasing every year.

CONCLUSION

Diseases of the internal secretory glands are one of the most important medical problems that pose a serious threat to human health. The introduction of modern medical technologies allows new opportunities for the early detection, treatment and surveillance of these diseases. Further improvement of diagnostic equipment, treatment methods based on an individual approach, widespread introduction of artificial intelligence and digital monitoring systems into practice will not only improve the quality of treatment, but also improve the quality of life of patients. Therefore, medical shame in diseases of the internal secretory glands. Effective application of medical technologies will not only form best practice in the field of medicine, but also gives an important role in raising a healthy offspring. It is expected that in the future, scientific research and technological innovations in this direction will be more widely used in medical practice. Diseases related to the endocrine glands, in particular diabetes mellitus, thyroid dysfunctions and adrenal gland diseases are among the most common problems today. Timely detection and constant monitoring of them is important for maintaining public health. With the development of medical technologies, it is possible to detect diseases using advanced methods, remote monitoring, as well as to monitor patients without interruption, which serves to promote a healthy lifestyle. Diseases related to the endocrine glands, in particular diabetes mellitus, thyroid dysfunctions and adrenal gland diseases are among the most common problems today. Timely detection and constant monitoring of them is important for maintaining public health. With the development of medical technologies, it is possible to detect diseases using advanced methods, remote monitoring, as well as to monitor patients without interruption, which serves to promote a healthy lifestyle.

REFERENCES

Anvarovich, A. S., & Qizi, Y. D. A. (2025). THE ROLE AND IMPORTANCE OF MODERN COMPUTER TECHNOLOGIES IN THE DIAGNOSIS AND TREATMENT OF AUTISM IN YOUNG CHILDREN.

ATAKHANOV, S., & MAKSUMOV, M. (2024). Technology for developing critical thinking in students through biological problem modeling in medical education.

Атаханов, С., & Максумов, М. (2024). Технология развития критического мышления у студентов медицинских вузов через моделирование биологических проблем. Общество и инновации, 5(11/S), 287-291.

Atakhanov, S. A., & Burieva, N. A. (2024). Developing Medical Competencies in Students Through the Use of Biological Modeling Technologies in Medical Education. European Journal of Innovation in Nonformal Education, 4(12), 321-323.

Атаханов, С. (2023). РОЛЬ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИИ В ЛЕЧЕНИИ ОНКОЛОГИЧЕСКИХ ЗАБОЛЕВАНИЙ. Евразийский журнал академических исследований, 3(4 Part 2), 87-89.