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THE USE OF THE LATEST COMPUTER TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE IN THE DIAGNOSIS AND TREATMENT OF ENDOCRINE DISEASES IN CHILDREN

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Abstract
One of the most important tasks facing medical science in the 21st century is a deeper study of the human body, early detection of diseases and effective treatment. For this purpose, computer technologies and artificial intelligence systems are being widely introduced worldwide. This approach is gaining increasing importance, especially in the field of endocrine diseases in children. Because the endocrine system is a complex mechanism that ensures the growth, development, metabolism and humoral balance of the child, and any disruption in it negatively affects the functioning of the child's entire organism.

Keywords: Endocrine diseases, diagnostics, treatment methods, artificial intelligence, digital technologies in medicine, innovations in endocrinology, digital diagnostics, endocrine system in children

Introduction

Traditional methods of medicine in many cases rely on human experience. However, computer technologies provide the opportunity to automatically analyze large amounts of data, make statistical comparisons and increase diagnostic accuracy.

Artificial intelligence takes this process to a new level. It studies and analyzes data, draws conclusions, and sometimes serves as an assistant in doctor's decisions.

2. The endocrine system and the main diseases of children

The endocrine system is a system of glands that produce hormones, through their activity all organs of the body work in harmony. In children, this system is actively formed during growth and sexual development. The endocrine system includes several main glands. The pituitary gland is the central gland that controls the

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activity of all glands. The thyroid gland regulates metabolism in the body. The adrenal glands play an important role in stress and blood pressure control. The pancreas produces insulin, thereby maintaining the level of glucose in the blood. The gonads ensure the sexual development of organisms.

One of the most common endocrine diseases in children is hypothyroidism and hyperthyroidism. Hypothyroidism is caused by underactivity of the thyroid gland, and hyperthyroidism is caused by overactivity of the thyroid gland. In addition, there are growth hormone deficiency, obesity and metabolic syndrome, and adrenal gland diseases.

3. Traditional diagnostic methods

There are 3 stages in the diagnosis of endocrine diseases. They include clinical examination, laboratory analysis and instrumental analysis. During a clinical examination, the child's height, weight, body proportions, skin condition, heart rate, speech and behavior are examined. Laboratory analysis determines the level of hormones (TSH, T3, T4, insulin, cortisol, growth hormone). Instrumental analysis studies the state of the internal glands using methods such as ultrasound, CT, MRI, densitometry. However, some of these methods depend on human experience, misinterpretation of information, laboratory errors and time constraints. Therefore, the need for computerized diagnostics has arisen.

4. The role of computer technology in medicine

With the introduction of computer technology into medicine, diagnostic processes have accelerated and increased accuracy.

Today, the following systems are widely used:

1) Electronic medical records: all patient data are stored in a single database

2) Digital laboratory analysis: results are obtained without human intervention using automated analyzers.

3) Telemedicine systems: for remote diagnostics and online consultations.

4) 3D and 4D visualization programs: allow you to obtain and analyze volumetric images of organs.

Computed tomography and MRI: detect small pathological changes in the glands. For example, using computed tomography and MRI, microadenomas in the pituitary gland, tumor foci in the adrenal glands, and thyroid nodules can be detected at an early stage.

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5. Application of artificial intelligence in endocrinology

Artificial intelligence is a system that models certain functions of the human brain, and in medicine it is used in the processes of prognosis, diagnosis, individualization of treatment and monitoring.

Artificial intelligence performs the following tasks in the diagnostic process:

• Analyzes the results of the analysis (hormones, glucose, metabolic indicators).
• Converts images (UZ, MRI, CT).
• Determines the probability of the disease.
• Makes recommendations for the doctor.

Artificial intelligence performs the following tasks in treatment:

• Calculates the most appropriate drug dose and treatment regimen for the patient

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