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HISTOLOGICAL STRUCTURE AND FUNCTIONAL SIGNIFICANCE OF THE ENDOCRINE SYSTEM

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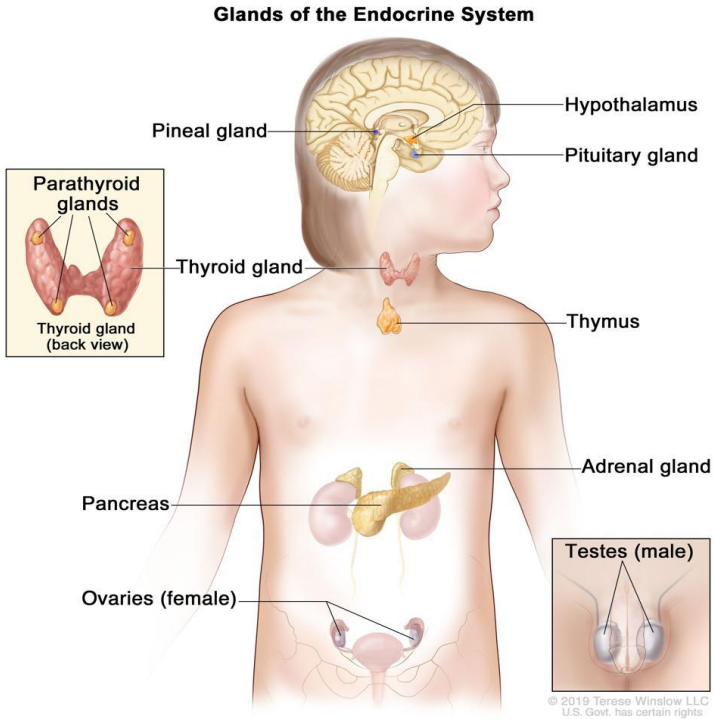
Abstract
This article examines the histological structure of the endocrine system, its main glands, and their functional significance in the human body. The microscopic structure of endocrine glands, hormone synthesis, and their role in regulating physiological processes are analyzed. The results indicate that the endocrine system plays a crucial role in maintaining homeostasis.
Keywords: endocrine system, hormones, histology, pituitary gland, thyroid gland, adrenal glands, homeostasis

INTRODUCTION

The endocrine system is one of the key regulatory systems of the human body. It controls internal balance, growth and development, and metabolic processes through the secretion of hormones. This system includes the pituitary gland, thyroid gland, parathyroid glands, adrenal glands, and the endocrine part of the pancreas.

From a histological perspective, endocrine glands have a unique structure, as they lack ducts and release hormones directly into the bloodstream. Therefore, they possess a highly developed network of blood capillaries.



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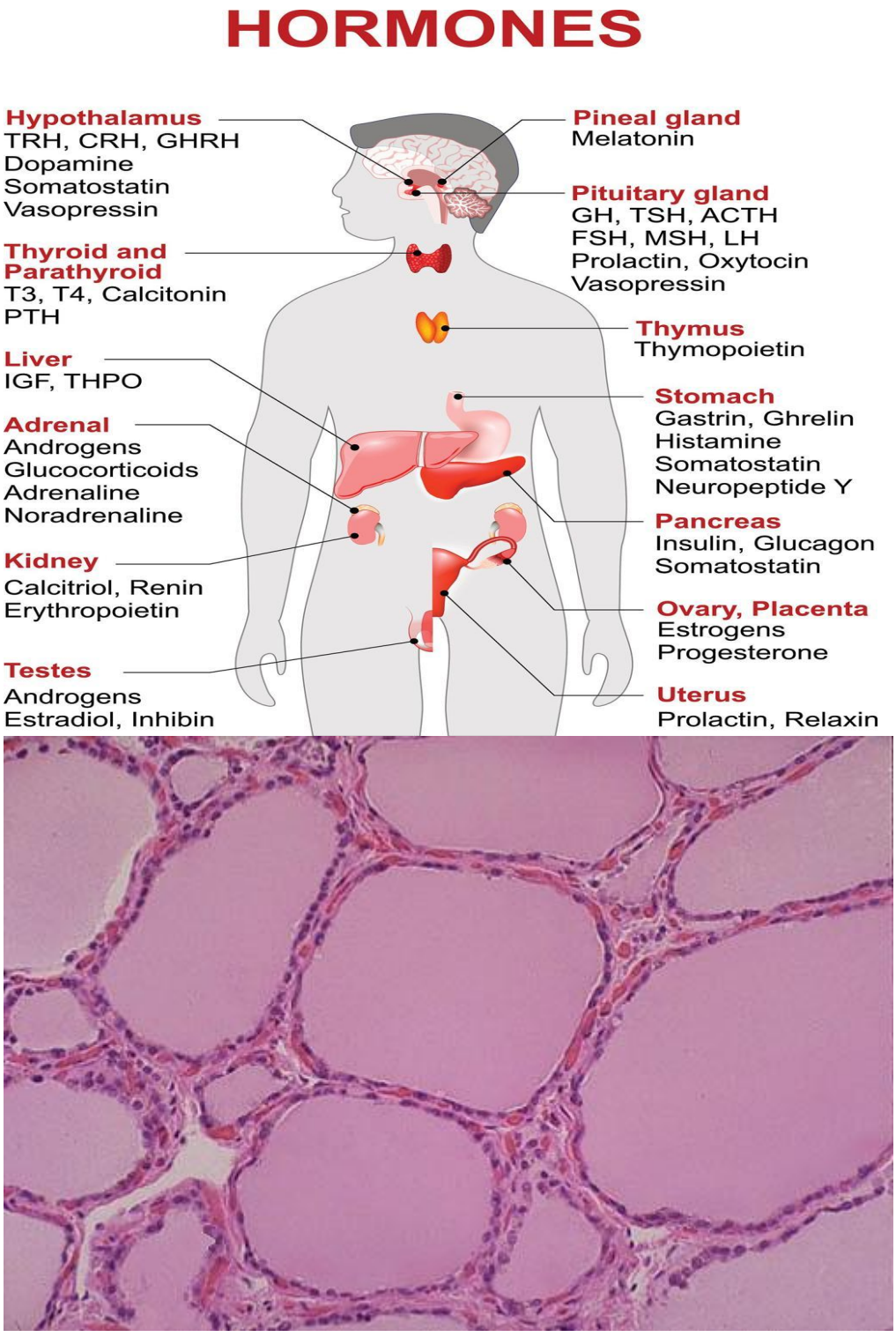

Disorders of the endocrine system can lead to various diseases such as diabetes mellitus, hypothyroidism, and hyperfunctional conditions. Thus, studying this system in detail is of great importance in medical science.

MATERIALS AND METHODS

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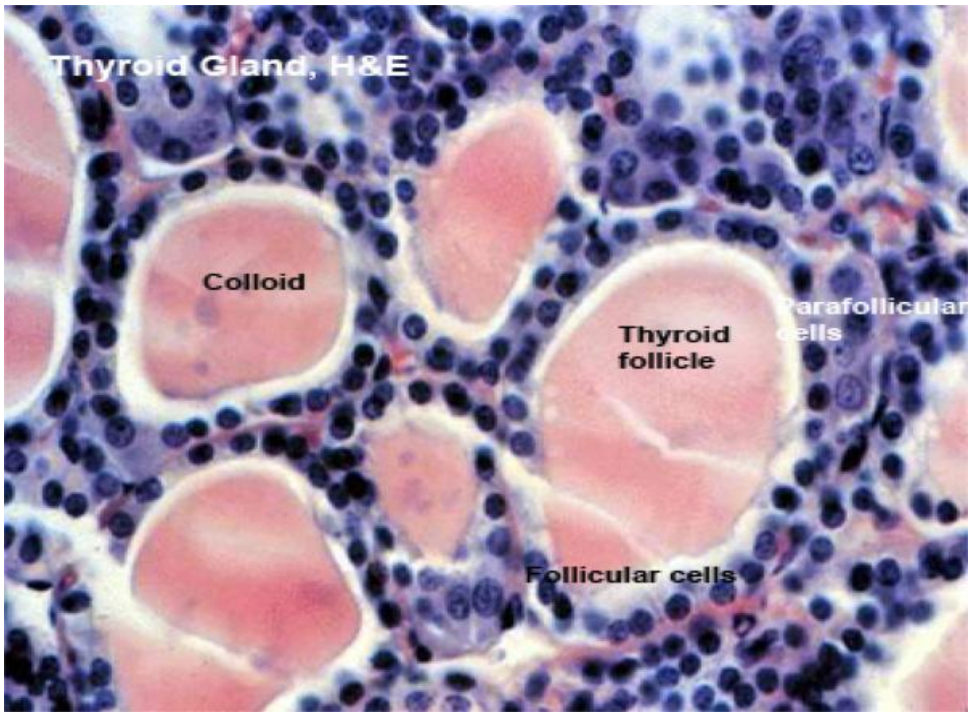
This study was conducted based on the analysis of scientific and pedagogical literature. The following methods were used:

- Microscopic analysis of histological specimens
- Comparative analysis of scientific literature
- Study of the structure and functions of endocrine glands
- Analysis using diagrams and schematic representations

The main objects of the study were the primary glands of the human endocrine system.

RESULTS



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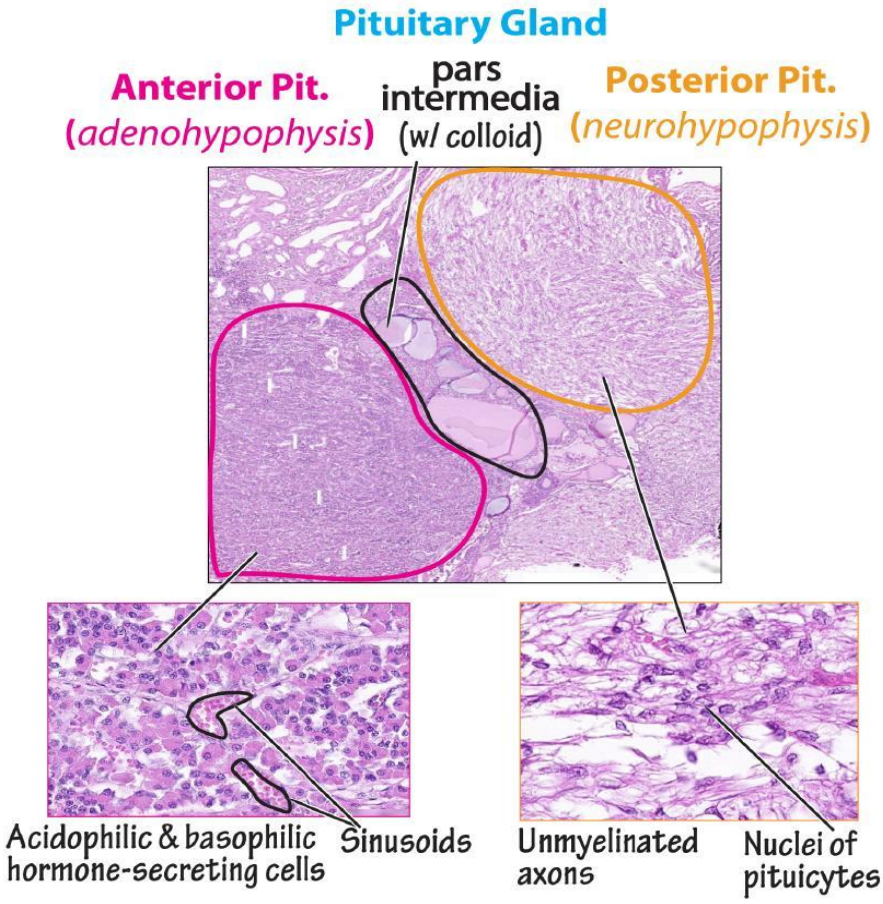

The results of the study showed that endocrine glands have the following histological features:

- **Pituitary gland:** consists of anterior and posterior parts and produces various hormones
- **Thyroid gland:** composed of follicles and synthesizes thyroxine (T4) and triiodothyronine (T3)
- **Adrenal glands:** consist of cortex and medulla and regulate stress responses and metabolism
- **Pancreatic islets (Islets of Langerhans):** produce insulin and glucagon

Additionally, all endocrine glands are characterized by a well-developed vascular system, which ensures the rapid distribution of hormones throughout the body.

DISCUSSION

The histological structure of the endocrine system is closely related to its functional properties. The rich capillary network allows hormones to quickly enter the bloodstream.

Histological changes often lead to various diseases. For example:

- Dysfunction of the thyroid gland leads to metabolic disorders
- Insulin deficiency results in diabetes mellitus
- Adrenal gland dysfunction reduces the body's ability to cope with stress

Modern histological and microscopic technologies enable early diagnosis of endocrine disorders.

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CONCLUSION

The endocrine system is one of the most important regulatory systems of the human body. Studying its histological structure and functional characteristics is essential in medicine.

The normal functioning of endocrine glands ensures the maintenance of homeostasis. Therefore, in-depth study and analysis of this system using modern methods are crucial for training future medical specialists.

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