



MORPHOLOGICAL STRUCTURE AND FUNCTION OF OVARIES OF HYPOPARATHYROIDISM

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Received: January 10 th 2022 Accepted: February 10 th 2022 Published: March 24 th 2022	The parathyroid gland primarily maintains the exchange of calcium-phosphate homeostasis in the blood. The parathyroid gland consists of 4 small glands located behind the thyroid gland in the middle part of the front of the neck. The parathyroid gland secretes parathyroid hormone, a polypeptide, in response to low levels of calcium in the blood. Changes in these indicators affect the development of the body's organs. Parathyroid hormone promotes the synthesis of active vitamin D, calcitriol in the kidneys. In combination with calcitriol, parathyroid hormone regulates the levels of calcium and phosphate in the blood. The effects of parathyroid hormone appear in the bones, kidneys, and small intestine. Hypoparathyroidism has no direct effect on the morphology and function of the ovaries. Changes in general indicators can affect the development and changes in the functions of the ovaries of the female body. As serum calcium levels decrease, secretion of parathyroid hormone by the parathyroid gland increases. An increase in serum calcium levels serves as a negative feedback loop, signaling the parathyroid glands to stop releasing parathyroid hormone. Understanding parathyroid hormone is of paramount importance and relevance, and enhances avenues of correction.

Keywords: parathyroid gland, hypoparathyroidism, ovaries.

Hypoparathyroidism is the content of parathyroid hormone deficiency, often caused by autoimmune disease, iatrogenic damage, or removal of the glands during a thyroidectomy. Symptoms of hypoparathyroidism cause hypocalcemia and include tingling in the hands or around the mouth and muscle cramps. Hypoparathyroidism of the occurrence of hypocalcemia and hyperphosphatemia and in the detection of accidental causes of chronic tetany. Parathyroid hormone is a polypeptide that is synthesized and cleaved to active forms in the parathyroid gland. Active secretion of parathyroid hormone can occur as early as a few seconds when a low serum calcium level is detected. The mechanism of secretion is exocytosis. The process by which a hormone is released through a membrane vesicle that is transferred to the cell membrane. Hypoparathyroidism occurs more often as a result of a deficiency of parathyroid hormone. This occurs when:

- Complete or partial removal of several parathyroid glands during thyroidectomy
- Hereditary and autoimmune diseases
- Postoperative hypoparathyroidism

In bones, parathyroid hormone indirectly stimulates the release of calcium through osteoclasts, which ultimately leads to bone resorption. Osteoclasts have the ability to remodel bone (resorption) by dissolving and degrading hydroxyapatite and other organic materials, releasing

calcium into the blood. Hypoparathyroidism does not occur with the same frequency as an overactive gland, and may also vary in duration. Hypoparathyroidism also correlates with hypocalcemia, which can cause abdominal pain, muscle spasms, and paresthesias. Two clinical tests that are commonly done to evaluate hypocalcemia are Chvostek's and Trousseau's signs. Calcium is a divalent cation essential for the functioning of the heart, kidneys, bones, and nervous system, making PTH function extremely important. Calcium plays an integral role in heart contractions. The contractility of the heart is determined by the presence and role of calcium in myocardial cells. When there is an excess amount of calcium in the heart cells, the contractility increases, and similarly, when the concentration of calcium in the heart cells is less, the contraction decreases. Reduced blood circulation affects the development of organs. At the same time, the ovaries suffer, blood circulation decreases, thereby lagging behind in development.

The mechanisms of the effect of sex hormones on bone tissue are extremely important and not fully understood. However, after the discovery of specific receptors on osteoblasts for estrogens, androgens, growth hormone, and thyroid hormones, it became clear that spongy bone tissue is a kind of target organ for sex hormones. Estrogens have the most significant effect on bone and mineral metabolism, as they activate



osteoblasts, inhibit the production of interleukins by activating apoptosis of osteoclasts, promote inhibition of bone resorption, reduce the sensitivity of bone tissue to the resolving effect of parathyroid hormone, increase the sensitivity of bone tissue to vitamin D3, and stimulate the synthesis of calcitonin, regulate the processes of absorption and release of Ca, activate apoptosis of osteoclasts. A decrease in estrogen levels leads to an acceleration of bone metabolism and bone loss.

The ovaries produce sex steroid hormones, ensuring the reproductive function of a woman. The morphological and functional features of the ovaries are closely interdependent and undergo certain changes in a natural dependence on the woman's age, her general condition, living conditions, many factors of the internal and external environment, and hereditary characteristics. These processes do not depend on changes in parathyroid hormone. Indirectly, this can affect the development and circulation of the ovaries. In the ovaries, a peripheral cortical layer, which makes up most of the ovary, and a medulla or vascular layer are distinguished. The stroma of the cortical layer consists of round and spindle-shaped cells located in a dense network of collagen fibers; there are very few elastic fibers in the stroma. In the stroma of the medulla of the ovaries there are many blood vessels, collagen and elastic fibers. Blood and lymphatic vessels pass from the medulla of the ovary to the cortical and branch out in it. The place where the vessels enter the ovary is called its gate (hilus ovarii). The blood supply to the ovaries is carried out mainly due to the ovarian artery and the ovarian branch of the uterine artery (a. ovarica and r. ovaricus a. uterinae). The intraorganic venous bed in the ovary exceeds the arterial bed by 1.5–2 times. The veins are tortuous, their caliber is much larger than the caliber of the arteries, with a large number of anastomoses. The network of lymphatic capillaries of the cortical and medulla of the ovaries forms loops of triangular, oval and polygonal shapes. The innervation of the ovaries is very complex. They have two types of nerve fibers - sensory and motor. In the medulla of the ovary there is a rich nerve plexus, consisting of pulpy and non-pulmonic nerve fibers, and in the cortical layer there is a less dense and more delicate plexus. Nerve terminals are included in the layers of the follicular epithelium.

The ovary is an important organ of the female reproductive system that produces the egg. When the egg is released, it passes through the fallopian tube towards the uterus, where it can be fertilized by a sperm. The ovaries secrete hormones that play a role in the menstrual cycle and fertility. The ovaries are considered the female gonads and are involved in important body processes. With hypoparathyroidism, it changes blood circulation, innervation of the organ. This

affects the development of abnormalities in ovarian function. Each ovary is whitish in color and is located along the side wall of the uterus in an area called the ovarian fossa. The ovarian fossa is the area bounded by the external iliac artery and anteriorly by the ureter and internal iliac artery. The ovaries are surrounded by a capsule and have an outer cortex and an inner medulla. The capsule is made up of dense connective tissue and is known as the albuginea. The ovaries lie in the abdominal cavity on either side of the uterus, to which they are attached via a fibrous cord called the ovarian ligament. The ovaries are exposed in the abdomen but are attached to the body wall by the suspensory ligament of the ovary, which is the posterior continuation of the broad ligament of the uterus. The surface of the ovaries is covered with a membrane, which consists of a lining of a simple cubo-columnar mesothelium, it is called the germinal epithelium. The outer layer is the ovarian cortex, consisting of the ovarian follicles and stroma between them, divides it into parts. The composition of the ovarian follicles includes ovarian cumulus, granulosa membrane, corona radiata, zona lucidum, and primary oocyte. Secondary sexual characteristics begin to develop in response to the action of hormones. The ovary changes structure and function beginning with puberty. Because the ovaries are able to regulate hormones, they also play an important role in pregnancy and fertility. When eggs (oocytes) are released from the fallopian tube, various feedback mechanisms stimulate the endocrine system, which causes changes in hormone levels. These feedback mechanisms are controlled by the hypothalamus and pituitary gland. Attention should be paid to the quality of the operation, which may involve a change in the structure or removal of the parathyroid gland. PTH itself does not directly act on the ovary, indirectly changing the blood flow and innervation can cause anomalies in the development of the organ.

REFERENCES:

1. Byrd C, Kashyap S, Kwartowitz G. Jul 31, 2021. Parathyroid Cancer.
2. Lofrese JJ, Basit H, Lappin SL. Jul 22, 2021. Physiology, Parathyroid.
3. Hans SK, Levine SN. Jul 18, 2021. Hypoparathyroidism.
4. Goyal A, Anastasopoulou C, Ngu M, Singh S. Aug 8, 2021. Hypocalcemia.
5. Silva BC, Cusano NE, Bilezikian JP. Primary hyperparathyroidism. *Best Pract Res Clin Endocrinol Metab.* 2018.
6. Gougeon A 1996 Regulation of ovarian follicular development in primates: facts and hypotheses. *Endocr Rev* 17.



7. Reynolds SRM 1950 The vasculature of the ovary and ovarian function. *Recent Prog Horm Res* 5:65
8. Soyal SM, Amleh A, Dean J 2000 FIGalpha, a germ cell-specific transcription factor required for ovarian follicle formation.
9. Uda M, Ottolenghi C, Crisponi L, Garcia JE, Deiana M, Kimber W, Forabosco A, Cao A, Schlessinger D, Pilia G 2004 Foxl2 disruption causes mouse ovarian failure by pervasive blockage of follicle development. *Hum Mol Genet.*
10. Harris SE, Chand AL, Winship IM, Gersak K, Aittomaki K, Shelling AN 2002 Identification of novel mutations in FOXL2 associated with premature ovarian failure.