

Assignment

Course Title: Chemical Pathology

Instructor: Adnan Ahmad

Submitted by: shamsut tamraiz 14537

Q1) THROID HORMONES,

The thyroid hormone is produced and released by the thyroid gland, i.e. (T₃) and (T₄). They are the tyrosine-based hormones that are primarily responsible for the metabolism. T₃ and T₄ are partially composed of iodine. Iodine deficiency causes a decrease in the production of T₃ and T₄, enlarges the thyroid tissue and will cause the disease known as simple goiter. The main form of thyroid hormone in the blood is the (T₄), which is now half life compared to T₃. In humans, the ratio of T₄ is released into the blood, approximately 14:1. T₄ is converted into active T₃ (three to four times stronger T₄) within the cells deiodinases (5 s-o-o-d). These are further implemented by iodothyronamine (T_{1a}) and thyronamine (T_{0a}) to produce decarboxylation and deiodinases All three isoforms of the deiodinases are selenium-containing enzymes, thus dietary selenium is essential for T₃ production. TSH is necessary for secretory activity of the thyroid gland, Degradation of thyroid hormones occurs in muscles, liver and kidney.

Function,

Thyroid hormone levels are low, so they secrete more TRH and TSH, which stimulates the thyroid to make more hormones. Thyroid hormone levels are too high, so they secrete less TRH and TSH, which reduces hormone production by the thyroid. fat metabolism, carbohydrate metabolism, on protein metabolism, on body weight, on cardiovascular system, To increase basal metabolic rate, To stimulate growth. test for thyroid hormones function, Measurement of plasma level of T₃ and T₄. Measurement of TRH and TSH, Measurement of basal metabolic rate.

Target tissue, _____ mechanism _____.

Nervous system, promote normal brain development.

Heart, Increase number, affinity of beta adrenergic receptors Enhance responses to circulating catecholamine

Muscle, Increase protein breakdown,

Bone, Promote normal growth and skeletal development,

Gut, associated with carbohydrate absorption,

Adipose tissue, stimulate lipolysis.

Lipoprotein, stimulate formation of LDL receptors.

Other, Stimulate formation of LDL receptors Stimulate oxygen consumption by metabolically active tissues Increase metabolic rates Promote development of reproductive system Maturation of fetal lungs,

The end...

Q2) explain and classify adrenocortical hormone.

Explanation of Adrenocortical hormone,

Adrenocortical hormones are hormones that make up the outer region of the adrenal cortex, the adrenal gland. These polycyclic steroid hormones have a difference of roles that are critical to the body's response to stress e.g., fight or flight response, and they also control other functions in the body. Risks to homeostasis, such as injury, chemical imbalance, infection, or stress, can trigger a stress response. Examples of Adrenocortical hormones involved in the stress response are aldosterone and cortisol. These hormones also work to regulate water conservation through the kidneys and glucose metabolism, respectively.

Classes of Adrenocortical hormone,

Adrenocortical hormones are divided into three classes according to their function: mineral corticoids, glucocorticoids, and androgens.

A) Mineral corticoids

Mineral corticoids are a class of corticosteroids, which in turn are a class of steroid hormones. Mineral corticoids are produced in the adrenal system and affect the salt and water balance (electrolyte balance and fluid balance). The primary mineral is aldosterone.

Mineral corticoid hormones are synthesized in the outermost layer of the adrenal cortex, called zona glomerulosa. Their job is to regulate the concentration of electrolytes circulating in the blood. For example, aldosterone works to increase blood sodium levels and blood potassium levels by targeting the kidneys. Specifically, it binds to receptors in the cells that make up the distant renal tubules that then activate ion channels to protect sodium and release potassium. Furthermore, ion gradient initiates water conservation.

B) Glucocorticoids.

Glucocorticoids are a class of corticosteroids; a class of steroid hormones glucocorticoids is corticosteroids that bind to glucocorticoids receptors that are present in the cells of almost every aquatic animal. The name "glucocorticoids" is (glucose + administration + steroid) and is formed by its role in the regulation of glucose metabolism, which is synthesized in the adrenal cortex; Glucocorticoids of hormones are synthesized in the middle layer of the family adrenal cortex called zona fasciculata. These hormones regulate the processing of proteins, fats and carbohydrates by the human body. They also play a role in maintaining a normal response to stress.

C) Androgens,

Androgens or sex hormones are synthesized in the inner layer of the adrenal cortex called zona reticularis. These hormones, such as estrogen in women and testosterone in men, are generally known to promote sexual characteristics and maturity of the reproductive organs of the respective sex.

The end...

Q4) defined and explain hyperthyroidism and hypothyroidism.

Hyperthyroidism,

Definition,

Hyperthyroidism excessive thyroid hormones production also called hyperthyroidism,

Explanation,

The term hyperthyroidism refers to any condition in which the body produces too much thyroid hormone. In other words, the thyroid gland is more nutritious. Another term you may hear for this problem is thyrotoxicosis, which causes high levels of thyroid hormone in the bloodstream, regardless of the source, can cause the following diseases,

1. Graves' disease, autoimmune condition which the thyroid over stimulation.
2. Thyroid adenoma.

Sign and symptoms,

Toxic goiter Polycythemia, Tachycardia, Increased sweating, Decreased body weight, Diarrhea, Muscular weakness.

Causes,

Causes of hyperthyroidism include:

Excess iodine is an important component in T4 and T3, thyroiditis, or inflammation of the thyroid, which causes the T4 and T3 glands to secrete, ovarian or testicular tumors, benign tumors of the thyroid or pituitary gland, Large amounts of tetrahydrotherapeutics taken with dietary supplements or medicines.

Hypothyroidism,

Definition,

Hypothyroidism too much Thyroid hormones production also called hyperthyroidism, enlarged of the thyroid gland is known as goiter a general term a thyroid swelling.

Explanation,

Hypothyroidism is a medical condition. If a person has hypothyroidism, their thyroid gland does not make enough hormones. It can be caused by many factors, but it is more common when a person has insufficient iodine. Severe hypothyroidism in newborns can result in cretinism.

Symptoms,

Hypothyroidism include: fatigue, headache, weight gain, dry skin, constipation and poor concentration.

Causes,

The most common cause of hypothyroidism is Hashimoto's thyroiditis (or autoimmune hypothyroidism), a type of thyroid inflammation caused by your own immune system. But it's not the only cause of hypothyroidism - it can have many other causes. This article explains all the possible causes of hypothyroidism.

Medications,

Anti-thyroid medications, Interleukin-2 (IL-2), Lithium,

The end...

What are hormones?

Hormones are natural substances produced in the body. They help to send messages between cells and organs and affect bodily functions. Everyone has "male" and "female" sex hormones.

Sex hormones,

Any of various steroid hormones, such as estrogen and androgen, affecting the growth or function of the reproductive organs and the development of secondary sex characteristics,

Sex hormones Types,

The two main female sex hormones are estrogen and progesterone. Although testosterone is considered a male hormone,

Estrogen,

Any of the many major female sex hormones produced primarily from the mammalian ovaries, capable of inducing estrogens, is capable of developing and maintaining the sexual characteristics of secondary females, and the reception of fertile eggs. Prepares the uterus for: especially in artificial form, such as a component of oral contraceptives, in some cancer treatments and in other treatments,

Estrogen plays a major role in reproductive and sexual development, including:

Menstruation, Pregnancy,

Progesterone,

The ovaries produce the female sex hormone progesterone after ovulation. During pregnancy, the placenta also produces something.

The role of progesterone is prepare the uterine lining for a fertilized egg, Support pregnancy, Suppressing estrogen production after ovulation, Progesterone levels can be determined by a blood test. Normal limits are in Nin gram per milliliter (ng / mL).

Testosterone,

Testosterone is a male sex hormone that is important for sexual and reproductive development. The National Institutes of Health considers testosterone to be the most important male hormone. Women also make testosterone, but at lower levels than men.

Testosterone belongs to a class of male hormones called androgens, sometimes called steroids or anabolic steroids. In men, testosterone is mainly produced in the testes, with small amounts in the adrenal glands. Brain hypothalamus and pituitary gland control testosterone production. The hypothalamus instructs the pituitary gland on how much testosterone to make, and the pituitary gland carries this message to the testes. This communication takes place in the bloodstream through chemicals and hormones. Testosterone is involved in the development of the male genitalia before birth, and in puberty during the development of secondary sexual characteristics, such as deepening the voice, increasing the size of the penis and testicles, and developing facial and body hair.

Hormones changes over time,

The role of your hormones changes over time, female sex hormones are essential for many body functions. But there is a big change in your hormonal needs when you leave childhood and

enter puberty; they also change dramatically if you become pregnant, give birth, or breastfeed. And they change as you approach menopause, these changes are natural and predictable.

The end...

Q5) how calcium regulated? Define osteomalacia.

Calcium:

A mineral found mainly in the hard part of the bones, where it is stored. Calcium enters the bones into the bone called osteolists and removes bone from the bone called osteoclasts. Calcium is essential for healthy bones and is responsible for muscle contraction, heart action, and normal blood clotting, Is also important.

Calcium regulation,

Blood levels of calcium are regulated by the parathyroid hormone, which works on the bones, kidneys and intestines to keep them stable.

Regulated by parathyroid hormone (PTH), which is produced, the level of calcium in the blood is determined by the parathyroid gland. PTH is released in response to low levels of calcium in the blood. It raises calcium levels, targeting the skeleton, kidneys and intestines. In the skeleton, PTH stimulates osteoclasts, which are the cells that cause bone regeneration and release calcium from the bone into the bloodstream. PTH also inhibits osteoblasts, the cells in the bones that collect calcium, which reduces the storage of calcium in the bones. In the intestines, PTH increases dietary calcium absorption and in the kidneys, PTH stimulates the reabsorption of calcium. While PTH works directly on the kidneys to increase the reabsorption of calcium, it has a direct effect on the intestines. PTH stimulates the formation of active calcitriol, an active form of vitamin D, which acts on the intestines, increasing the absorption of dietary calcium. The release of PTH increases blood calcium levels.

At least three hormones are involved in controlling the level of calcium in the blood.

Parathyroid hormone, calcitonin, and calcitriol,

Osteomalacia,

Osteoarthritis refers to a significant softening of your bones, often due to severe vitamin D or calcium deficiency.

Bones that soften the bones of children and young adults can cause bowing during development, especially in the weight-bearing bones of the legs. Osteoarthritis can cause fractures in older adults.

The end...