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**Department BS MLT (4th Semester)**

**Submitted to Adnan Khan**

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**Q1: Write sown a detail note on thyroid hormones.**

**ANS:**

1. Thyroid is an endocrine gland situated at the root of the neck on either side of the trachea.
2. Thyroid secretes 9% of T3
3. Secretes 90% of T4 and calcitonin.
4. Thyroid stimulating hormones is necessary for secretory activity of the thyroid gland.

**FUNCTIONS:**

1. Action on fat metabolism
2. Action on carbohydrates
3. Action on body weights
4. Action on protein metabolism
5. Action on cardiovascular system

**TYPES:**

**HYPOTHYROIDISM:** It is an underactive thyroid gland. It means that the thyroid gland cannot make enough thyroid hormone to keep the body working normally.

 People are hypothyroid if they have less thyroid hormone in the blood.

 **COMMON CAUSES:**

1. It includes the following common causes
2. are autoimmune disease
3. surgical removal of the thyroid
4. radiation treatment.

**DIAGNOSIS**

 ***family history.***

1. You should tell your doctor:
2. Changes in our health
3. Are you have thyroid surgery?
4. radiation to your neck to treat cancer
5. tell about medicine you take that cause hypothyroidism

**TESTS**

Two tests for diagnosis of hypothyroidism.

***TSH test****.*

The important test for hypothyroidism. This test measures how much of the thyroid hormone thyroxine (T4) the thyroid gland is being asked to make.

***T4 tests.***

Almost most of the T4 in the blood is attached to a protein called thyroxine-binding globulin. The “attached” T4 cannot get into body cells. Only about 1%–2% of T4 in the blood is free.

**HYPERTHYRADISM**

It occurs when your thyroid gland produces high amount of the hormone thyroxine. It can fast your body's metabolism, causing rapid weight loss and irregular heartbeat.

**TREATMENT**

Different treatments are available for hyperthyroidism that are as below.

1. use of anti-thyroid medications
2. radioactive iodine to slow the production of thyroid hormones.
3. surgery to remove all or part of your thyroid gland.

**COMPLICATIONS**

Hyperthyroidism can lead to several complications:

**Heart**

 The most serious issue is heart problem cause by hyperthyroidism. Increase rapid heart rate, a heart rhythm disorder, risk of stroke, and congestive heart failure.

**Brittle bones**

It can lead to cause bones week. The strength of your bones depends on the amount of calcium, phosphorous and other minerals they contain.

**Red, swollen skin**

 People with Graves' disease develop Graves' dermopathy. This affects the skin, causing redness and swelling, often on the shins and feet.

**Thyrotoxic crisis**

 Hyperthyroidism also places you at risk of thyrotoxic crisis, leading to a fever, a rapid pulse rate. If this occurs, seek immediate medical care.

**THYROID FUNCTION TESTS:**

1. Measurement of plasma level of T3 and T4.
2. Measurement of TRH and TSH
3. Measurement of basal metabolic rate.

**Q2: Explain and classify adrenocortical hormones.**

ANS:

1. **GLUCOCORTICOID**:
* This includes cortisol, its moderated metabolism of sugar, fat and proteins.
* Affects the blood glucose concentration.

 **GLUCOCORTICOIDS HORMONES**:

1. **CORTISOL:**

 Very potent, accounts of overall about 95% of all glucocorticoid’s activity

1. **CORTICOSTEERONE:**

Provide 4% of glucocorticoids activity

1. **CORTISONE:**

Potent as same is cortisol.

1. **PREDNSIONE:**

Four times potent as cortisol

1. **METHYLPREDNISONE:**

Synthetic, four time potent as cortisol.

1. **DEXAMETHASONE:**

Synthetic, 30 time potent as cortisol.

1. **MINERALCORTICOIDS:**

Affect the electrolytes minerals of the extracellular fluid’s sodium and potassium.

**MINERALCORTICOIDS HORMONES:**

1. **ALDOSTERONE**:

Very potent, account 90% of all activity.

1. **DESOXYCORTICOSTERONE:**

1/30 as potent as aldosterone

1. **CORTICOSTERONE:**

They have very low activity.

1. **9a FLUOCOCORTISOL:**

Synthetic, slightly more potent then aldosterone

1. **CORTISOL**:

Very slightly activity, but large quantity secreted.

1. **CORTISONE:**

Synthetic, slight activity

1. **SEX HORMONES:**

And a small amount of sex hormones

* Androgen
* Estrogen
* Testosterone
* Progesterone

**Q3: Define an explain hypothyroidism and hyperthyroidism**?

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**Q4: How calcium is regulated? Define osteomalacia**?

Ans: **REGULATION OF CALCIUM:**

Three hormones involved in the regulation of calcium level in the blood: parathyroid hormone (PTH), calcitonin and calcitriol.

 PTH comes parathyroid glands located at side of the thyroid gland in the lower part of the neck while calcitonin comes from cells in the thyroid gland, both of which maintain calcium levels in the blood. Vitamin D is synthesized in the kidney under the control of PTH.

 Calcitonin massage osteoclasts to slow down removal of calcium from bone; this action begin to lower levels of blood calcium. Shutting off calcitonin allows osteoclasts to get back in work to release needed calcium from bone.

The PTH system provides long-term, day-to-day regulation of calcium levels through many hormones. This is governed by the parathyroid glands and the calcitonin-secreting cells of the thyroid gland by their constant maintain of the blood calcium levels. The body also has a minute to minute regulation of calcium levels from osteocytes in bone—these cells can release needed calcium or stop releasing calcium depending on immediate needs.

**OSTEOMALACIA:**

It means soft bones. Bones are a living, active tissue that is can be being removed and replaced. This process is called as bone turnover. It consists of a hard-outer shell made up of minerals, mainly calcium and phosphorus, and a softer inner mesh made up of collagen fibers.

Osteomalacia happens when mineralization does not begin properly. In osteomalacia mostly bone is made up of collagen matrix without a mineral covering, that is the reason which make the bones soft. These softened bones ae not so strong and it may become bend and crack, and this can be very painful.

 These are usually due to problems in the kidneys which result in loss of phosphorous from the body. This is due to the reason transferred from parent to the offspring because of the deficiency of phosphorous and weakness of the parent body structure and in the bones.

**Q5: What are Sex Hormones?**

**SEX HORMONES:**

The sex hormones play a key role in sexual development and reproduction. These produced by gonads and adrenal glands.

 They are involved in reproduction and sexual development, Puberty, Inflammatory responses, promoting hair growth Regulating cholesterol level.

**FEMALE SEX HORMONES**

They are released by the ovaries and adrenal glands. It progesterone, estrogen, and small amounts of testosterone.

**Progesterone**

It produced by the adrenal glands, ovaries, and placenta. The levels are higher during ovulation and it fastens during pregnancy. It also stabilizes the menstrual cycle and prepares the body for pregnant.

**Estrogen**

It is released by the ovaries. Only a small amount of estrogen is released by the adrenal glands and fat cells. They are responsible for sexual and reproductive development during puberty.

**Testosterone**

Small amount of testosterone is produced in females. It affects menstruation, fertility, RBC production, and bone and tissue mass.

**MALE SEX HORMONES**

**Testosterone**

It is the only male sex hormone responsible for sexual and reproductive development. It belongs to a class of male hormones called androgens that are also known as steroids. It is mainly produced in the testes with a very small amount produced in the adrenal glands.

The testosterone production is controlled by the hypothalamus and pituitary gland. It is responsible for the development of male sex organs during birth and development of secondary sexual characteristics during puberty.

The testosterone levels gradually decrease with age. It results in impotence, low sperm count, shrunken testes, depression, irritability, etc.

**FUNCTIONS OF SEX HORMONES**

Following are the important functions of sex hormones:

**SEX HORMONES AT PUBERTY**

Puberty leads to many changes in the body both in boys and girls. Development of secondary sexual characteristics is one of the major changes that occur during adolescence.

During adolescence male testis and female ovaries are mature. The matured gonads (sex organs) begin to secrete hormones. These hormones are called sex hormones. They are responsible for the changes during puberty and the development of secondary sexual characteristics in males and females.