

NAME: ABBAS ALI SHAH

ID: 14509

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SUBJECT: CHEMICAL PATHOLOGY

INSTRUCTOR: DR ADNAN AHMAD

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ANS#01:

❖ **THYROID HARMONES:**

- ❖ Thyroid is an endocrine gland situated at the root of the neck on either side of the trachea.
- ❖ TSH is necessary for secretory activity of the thyroid GLAND.
- ❖ Degradation of thyroid hormones occurs in muscles liver and kidney.

❖ **RATE OF SECRETION:**

THYROXIN =80 TO 90 ug/day

Tri-iodothyronine =4 to 5 ug/day

❖ **PLASMA LEVEL:**

Total T3=0.12ig/dl

❖ **FUNCTION OF THROID HARMONES:**

- To increase basal metabolic rate.
- To stimulate growth.
- Action on fat metabolism.
- Action on protein metabolism.
- Action on body weight.
- Action on cardiovascular system.

❖ HYPERTHYROIDISM

❖ HYPOTHYROIDISM

❖ **THYROID FUNCTION TEST:**

- Measurement of plasma level of t3 and t4.
- Measurement of TRH and TSH.
- Measurement of basal metabolic rate.

❖ **MESURMENT OF TRH AND TSH:**

- There is almost total absence of these two hormones in hyperthyroidism but increase in hyperthyroidism.
- It is because of negative feedback mechanism.

❖ **MECHANISM OF BASAL METABOLIC RATE:**

In hyperthyroidism, basal metabolic rate is increased by about 30% TO 60%.
Basal metabolic rate is decreased in hypothyroidism by 20% to 40%...

ANS#03):

● **HYPERTHYROIDISM:**

Hyperthyroidism is caused by:

- ✚ Graves' disease
- ✚ Thyroid adenoma

● **SIGN AND SYMPTOMS:**

- ✚ Toxic goiter
- ✚ Polycythemia
- ✚ Tachycardia
- ✚ Atrial fibrillation
- ✚ Increased sweating
- ✚ Decreased body weight
- ✚ Diarrhea
- ✚ Muscular weakness

● **HYPOTHYROIDISM:**

Hypothyroidism leads to myxedema and cretinism in children.

● **SIGN AND SYMPTOMS:**

- ✚ Anemia
- ✚ Fatigue
- ✚ Extreme somnolence with sleeping disturbance.

- ✚ Decreased cardiovascular function such as reduction in rate and force of contraction of the heart,
- ✚ Cardiac output and blood volume, increase in body weight,
- ✚ Constipation
- ✚ depressed hair growth
- ✚ scariness of skin
- ✚ cold intolerance

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ANS#05):

➤ NOTE ON SEX HARMONES:

Hormones are chemical messengers that the endocrine glands produce and release into the blood stream.

Hormones help regulates many bodily process such as appetite sleep and growth

Sex hormones are also important for a range of bodily functions and a person general health.

In both males and females sex hormones are involved in”

- Puberty and sexual development reproduction.

- Sexual desire regulating bone and muscle growth inflammatory responses regulating cholesterol levels promoting hair growth body fat distribution sex hormones levels fluctuate throughout a person life,
 - Factors that can affect the level of female sex hormones include:
 - Age
 - Menstruation
 - Pregnancy
 - Menopause
 - Stress
 - Medications
 - Environment
- ❖ Sex hormones imbalances can lead to changes in sexual desire and health problems such as hair and health problems such as hair loss, bone loss, and infertility.

ANS#02)

❖ ADRENOCORTICAL HARMONES:

Their function is to regulate the concentration of electrolytes circulating of electrolytes circulating in the blood.

For example:

Aldosterone functions to raise blood sodium levels and lower blood potassium levels by targeting the kidneys.

❖ EXPLANATION:

In human and other animals the adrenocortical hormones are hormones produced by the adrenal cortex, the outer region of the adrenal gland.

These polycyclic steroid hormones have a variety of roles that is crucial for the body response to stress.

For example:

The fight or flight response and they also regulate other functions in the body.

Threats to homeostasis, such as injury, chemical imbalances, infections, or psychological stress, can initiate a stress response.

❖ CLASSES:

Adrenocortical hormones are divided into three classes by function:

- Mineralocorticoids
- glucocorticoids,
- Androgens

✚ Mineralocorticoids:

Hormones are synthesized in the outermost layer of adrenal cortex known as zona glomerulus.

Their function is to regulate the concentration of electrolytes circulating in the blood.

✚ Glucocorticoids:

A hormone is synthesized in the middle layer of adrenal cortex known as zona fasciculate.

This hormone regulates the processing of proteins fats and carbohydrates by the human body.

✚ Androgens:

A hormone is synthesized in the inner layer of adrenal cortex known as zona reticularis.

➤ **STRUCTURE:**

Adrenocortical hormones are considered steroid hormones because of the shared characteristic of the cholesterol backbone.

The structure of different steroids differs by the types and locations of additional atoms on the cholesterol backbone.

The cholesterol backbone consists of four hydrocarbon rings,

Three cyclohexane rings and one is cyclopentane that contribute to its insolubility in aqueous environments,

However the hydrophobic nature allows them to readily diffuse through the plasma membrane of cell,

This is the important to the function of steroid hormones as they rely on cellular response pathways to restore the homeostatic imbalance that initiated the hormones release.

ANS#04):

➤ **OESTEOMALACIA:**

- It is the disease characterized by the softening of the bone due to the impaired bone metabolism primarily due to inadequate level of calcium and vitamin D because of desorption of calcium.

✚ **SIGN AND SYMPTOMS:**

✚ Pain the bone

✚ Weakness of muscles

✚ Malaise

✚ Muscle and bones tenderness

✚ Easy fracturing

- CAUSES:
- Deficiency of vitamin d
- Deficiency of calcium
- Hereditary
- Malnutrition
 - TREATMENT:
 - diet therapy
 - milk
 - yogurt
 - cheese
 - almonds

B) CALCIUM REGULATES:

CALCIUM REGULATES THE BODY DUE TO MAIN PARATHYROID GLANDS AND ALSO SEE THE MAIN FOUR PARATHYROID GLANDS WHICH HAVE THE SAME POSITION OF THE PARATHYROID GLAND.

CALCIUM ALSO OCCUR IN MILK AND EGG ETC WHICH HAVE MAIN FUNCTION OF THE DETERMINE AND WILL OCCUR IN SAME POSITION OR GIVE WILL AS THE TERM OF PARATHYROID GLAND WHICH HAVE CALCIUM REGULATION IN THE SAME OCCURANCE IN THE CALCIUM POSITION,

IT WILL ALSO OCCUR IN CALCIUM PHOSPHATE AND WILL OCCURS DUE TO MAIN OCCURANCE..

IT WILL COMPOSED OF DIFFERENT TYPES OF THE SAME POSITION WHICH HAVE DUE TO MAIN FUNCTION AND IT WILL MAIN CALCIUM PHOSPHATE....

