TENDER HEART HIGH SCHOOL, SEC-33B, CHD

Class - 10 Date - 17.02.2025

Subject - BIOLOGY TEACHER - Nidhi Rana

CHAPTER - 12 ENDOCRINE SYSTEM

3. Thyroid Gland

Thyroid is a bilobed butterfly shaped gland.

Location It is located in front of the neck just below the larynx

Two lobes of gland are joined by isthmus

It releases 2 hormones - Thyroxine & Calcitonin

Thyroxine Hormone

Function - regulates basal metabolism (i.e. rate of cellular oxidation resulting in production of heat at rest] Thus it regulates the general growth of the body. It also influences general growth of body, ossification of bones, body temperature, mental development etc.

Hypothyroidism - Undersecretion of Thyroxine causes 3 conditions -

(i) Simple goitre is enlargement of thyroid, visible as a swelling in the neck. This is due to insufficient quantity of iodine in food It is endemic to people living in hilly areas as in hilly areas soil is deficient in ... Iodine hence in the food grown there. Use of iodised salt in food is best remedy for its deficiency.

(ii) Cretinism. Malfunctioning of thyroid in infants causes retarded physical and mental growth - dwarfism and mental retardation It is due to defective development, or early atrophy (degeneration) of thyroid.

(iii) Myxoedema In adults malfunctioning of thyroid causes lower basal metabolism, swollen face and hands, physical and mental dullness - sluggish person.

Oversecretion [Hyperthyroidism]

It causes Exophthalmic goitre [outword eye]

Symptoms of Exophthalmic goitre - Hyperthyroidism

It leads to increased metabolic rate causing an increase in heart beat, shortness of breath eyes are protruded and forms a goitre in the neck, restlessness.

4. Pituitary gland

Location It is a small projection (about size of pea) which hangs from base of the mid brain below hypothalamus.

Pituitary gland is the master gland because it seems to control practically all other endocrine glands

It has 2 distinct lobes -

Anterior pituitary [The front part] and the Posterior pituitary

The front part of posterior pituitary is different from the rest of the lobe and is called the intermediate lobe. Intermediate lobe is absent in humans but functional in some lower animals.

Hormones from Anterior Pituitary.

i) Growth Hormone (GH) Somatotropin - Hormone

It stimulates normal body growth.

Deficiency of GH in childhood causes dwarfism

Oversecretion of GH in childhood causes gigantism

Oversecretion of GH in adults causes acromegaly in which there is excessive growth of bones in face and in hands and feet. Person develops

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a large nose and thick lips.

ii Thyroid Stimulating Hormone. TSH activates thyroid to secrete thyroxine

iii Gonad stimulating (Gonadotropic hormones)

(a) Follicle stimulating Hormone FSH - It stimulates growth of gradfian follicle in female and in males it controls sperm formation.

(b) Luteinizing Hormone / Interstitial cell stimulating hormone
LH in female stimulates ovulation, formation of corpus luteum and its hormones
ICSH is responsible for testosterone secretion.

iv Adrenocorticotropic hormone ACTH regulates the activity of adrenal cortex.

Tropic Hormones - Hormones which stimulate other endocrine glands to produce their specific hormone
Tropic means - influencing the activity of the named organ Eg Thyrotropic - for thyroid
Adrenocorticotropic - for adrenal cortex etc.
Gonadotropic hormone stimulate gonads to produce certain hormones.

Hormones from Posterior Pituitary -

i) Antidiuretic Hormone ADH or Vasopressin
It acts on Kidneys increasing the reabsorption of water from kidney tubules.
It constricts the blood vessels with rise in the blood pressure.

Deficiency of ADH causes diabetes insipidus (water diabetes) in which urination is frequent and copious, resulting in loss of water from body and person becomes thirsty

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Difference between Diabetes mellitus & insipidus

Diabetes mellitus - ① urine contains sugar
Caused due to insufficient insulin

Diabetes insipidus - ① No sugar in the urine
Caused due to insufficient ADH/vasopressin.

2. Oxytocin It is called birth hormone
It causes contraction of uterus, during childbirth leading to birth of baby. It also stimulates milk ejection

Control of Hormonal influences

Feedback mechanism

i) Negative feedback - Body has a mechanism to maintain a normal state.
If there is fall below the normal, message arises like - "increase"
If there is rise above the normal, menage arises like - "decrease"
This kind of orderdering for the opposite is negative feedback. to restore the normal level Eg TSH level.

2) Positive feedback mechanism Example - Uterine contraction during child birth.
Normal state of uterus is uncontracted, one contraction (instead of commanding to come to normal) gives a message to continue to contract further. (Positive feedback) till delivery is completed.

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NOTE FOR STUDENTS

Please go through the chapter in the notes and as being discussed in the text book. Learn various hormones, their functions, their deficiency disorders - released from pituitary gland and Thyroid gland. It may require multiple readings to grasp the content completely

HOME ASSIGNMENT

Q1. Learn and write the general summary of Hormones - Table 12.4 'Hormones from four major endocrine glands and their principal action' (given on Page 161 of your text book) in your note book.

Q2. Answer the following "Review questions" (given on Page 163 - 164 of your text book) in your notebook

C. Short answer type questions
Q No 7 and 8

D Descriptive type
Q No 2 and 3

E Structured / Application / skill type
Q No 2.