G.D.GOENKA PUBLIC SCHOOL

Subject: Science (8th)

Saturday, 23rd October 2021

Topic: Endocrine System

This material is not to be printed.

LEARNING OBJECTIVE: To learn about the kingdom bacteria.

SKILL FOCUS: Composition and types of bacteria.

PARTS OF ENDOCRINE SYSTEM:

The endocrine system is made up of organs called glands. Glands produce and release different hormones that target specific things in the body. You have glands all over your body, including in your neck, brain and reproductive organs.
The main glands that produce hormones include:

1. **PITUITARY GLAND:**

Location: It is a pea-shaped gland located at the base of the brain and is attached to the hypothalamus by a stalk.

Structure: The pituitary gland is anatomically divided into anterior pituitary and posterior pituitary. The hormone secreted by the pituitary gland influence the secretion of other glands. Therefore, they are known as trophic hormones.

Functions of hormones secreted by pituitary:

- TSH stimulates the growth and functions of the thyroid gland.
- Growth hormone stimulates the growth and development of the body.

Important notes: Pituitary is called the master gland of the endocrine system. It is because:

- It is a hormone that regulates the activity of another endocrine system.
- It receives the messages about the need and to secrete the hormones that cause the manufacture and release of the hormone.

2. **ADRENAL GLAND:**

Location: It is located at the top of each kidney.

A hormone secreted: The hormone secreted by the adrenal gland is adrenaline.

Functions of adrenaline:

- It helps in defence of the body in emergency situations.
- It maintains the correct salt balance in the blood.

Exam tips: Adrenaline is often called the fight or the flight hormone as it prepares the body to act, especially when the body encounters stress.

It is also known as stress hormone as it helps to calm down when one is very angry, embarrassed or worried.

3. **THYROID GLAND:**

Location: It is located in the neck in front of wind pipe.

A hormone secreted: It produces a hormone called thyroxine. Iodine is required for the production of this hormone. The thyroid gland produces another hormone called calcitonin.

The role of Thyroxine:

- Thyroxine regulates the body temperature.
- It plays a major role in growth and development of the body.

The role of calcitonin: Calcitonin along with parathormone, produced by parathyroid gland regulates the level of calcium ions in the blood.

Diseases caused by under and over secretion of thyroxine:

- Hypothyroidism is a condition caused by underproduction of thyroxine. It is characterised by low energy production, slowing down of a heartbeat, loss of appetite and lethargy.
- Hyperthyroidism is a condition caused by overproduction of thyroxine. It is characterised by increased energy production, increased heartbeat, increased appetite, frequent sweating and shivering of hands.
- Apart from all these, it also causes a condition characterised by the retardation of mental and physical development. The condition is known as cretinism.

4. **PARATHYROID GLAND:**

Location: It is located on the posterior side of the thyroid gland.

A hormone secreted: It releases a hormone called parathormone.

The role of parathormone: It regulates the level of calcium ions in the blood.

What happens if there is increased production of parathormone in blood? Calcium salts are absorbed from the bones and added to the blood. As a result, bones become brittle.

Also, the kidney filters and excretes more calcium from the blood. This leads to stone formation in kidneys.

The deficiency of parathormone leads to deficiency called tetany. Tetany is manifested as strong spasms of muscles.

5. **PANCREAS:** The pancreas is a part of our endocrine system, and it plays a significant role in our digestive system too. It makes a hormone called insulin that controls the level of sugar in your blood.

Pancreatic islets house three major cell types, each of which produces a different endocrine product:

- **Alpha cells** (A cells) secrete the hormone **glucagon**.
- **Beta cells** (B cells) produce **insulin** and are the most abundant of the islet cells.
- **Delta cells** (D cells) secrete the hormone somatostatin, which is also produced by a number of other endocrine cells in the body.

6. **OVARIES:** In women, the ovaries release sex hormones called estrogen, progesterone and testosterone. Women have two ovaries in their lower abdomen, one on either side.

7. **TESTES:** In men, the testes (testicles) make sperm and release the hormone testosterone. This hormone affects sperm production, muscle strength and sex drive

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