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**SUBMITTED TO : SIR JAFFER**

**Endocrine System**

Classification of endocrine glands:    

**ENDOCRINEGLANDS**

Glands that secrete their product (hormones)  directly into the blood rather than through a duct

**EXAMPLE:**

•Pituitary gland

•Thyroid gland

•Adrenal glands

**Endocrine glands** are ductless [glands](file:///wiki/Gland) of the [endocrine system](file:///wiki/Endocrine_system) that secrete their products, [hormones](file:///wiki/Hormone), directly into the [blood](file:///wiki/Blood). The major glands of the endocrine system include the [pineal gland](file:///wiki/Pineal_gland), [pituitary gland](file:///wiki/Pituitary_gland), [pancreas](file:///wiki/Pancreas), [ovaries](file:///wiki/Ovary), [testes](file:///wiki/Testicle), [thyroid gland](file:///wiki/Thyroid), [parathyroid gland](file:///wiki/Parathyroid_gland), [hypothalamus](file:///wiki/Hypothalamus) and [adrenal glands](file:///wiki/Adrenal_gland). The hypothalamus and pituitary glands are [neuroendocrine](file:///wiki/Neuroendocrine) [organs](file:///wiki/Organ_(anatomy)).

1) **Pituitary gland**

**Def:**

"It control growth and development and functioning of the other endocrine glands."

**Structure:**

The pituitary gland, in humans, is a pea-sized gland that sits in a protective bony enclosure called the sella turcica.

**Location:**

It’s located behind your nose, near the underside of your brain. It’s attached to the hypothalamus by a stalklike structure.

**Function:**

It’s very important in controlling the balance of your bodily functions. It controls the release of hormones from the pituitary gland.

The pituitary gland is a part of your endocrine system. Its main function is to secrete hormones into your bloodstream. These hormones can affect other organs and glands, especially your: thyroid.

**Lobes:**

It consist of two lobes:

• Anterior lobe

• Posterior lobe

**Anterior lobe of pituitary:**

The anterior pituitary is considered the master gland of the endocrine system because it secretes numerous hormones,many of which regulate the secretory action of other endocrine glands.

**HORMONE:**

• Growth hormone (GH)

• Prolactin

• Thyroid stimulating hormone (TSH)

• Adrenocorticotrophic hormone (ACTH)

• Follicle stimulating hormone (FSH)

• Luteinising hormone (LH)

* **Growth hormone:**

**Growth hormone** regulates growth and physical development. It can stimulate growth in almost all of your tissues. Its primary targets are bones and muscles.

* **Thyroid-stimulating hormone:**

**This hormone** activates your thyroid to release thyroid hormones. Your thyroid gland and the hormones it produces are crucial for metabolism.

* **Adrenocorticotropic hormone:**

**This hormone** stimulates your adrenal glands to produce cortisol and other hormones.

* **Follicle-stimulating hormone:**

This is involved with estrogen secretion and the growth of egg cells in women. It’s also important for sperm cell production in men.

* **Luteinizing hormone.**

This is involved in the production of estrogen in women and testosterone in men.

* **Prolactin.**

It helps women who are breastfeeding produce milk.

**Posterior lobe:**

The posterior lobe of the pituitary gland also secretes hormones. These hormones are usually produced in your hypothalamus and stored in the posterior lobe until they’re released. Posterior pituitary is not glandular by itself. It does not synthesize any hormone. It is cells of hypothalamus.

**Hormones:**

1 Vasopressin (ADH)

2 oxytocin

Hormones stored in the posterior lobe include:

* **Vasopressin.** This is also called [antidiuretic hormone](file:///health/adh). It helps your body conserve water and prevent dehydration.
* **Oxytocin.** This hormone stimulates the release of breast milk. It also stimulates contractions of the uterus during labor

**Disorders:**

* Acromegaly.
* Adrenal Insufficiency (Addison's Disease)
* Craniopharyngioma.
* Cushing's Syndrome.
* Empty Sella Syndrome.
* Familial Isolated Pituitary Adenoma.
* FSH & LH Tumors.
* GH Deficiency.

2) **. Thyroid gland:**

The thyroid gland is an endocrine gland in your neck. It makes two hormones that are secreted into the blood.

**Structure:**

The thyroid is a butterfly-shaped gland that sits low on the front of the neck. It is about 2 inches long.

**Location:**

Thyroid lies below your Adam's apple, along the front of the windpipe.

**Lobes:**

The thyroid has two side lobes, connected by a bridge (isthmus) in the middle. When the thyroid is its normal size, you can't feel it.

**Hormones:**

**Triiodothyronine (T3):**

It affects almost every physiological process in the body:

* Growth and development
* Metabolism
* Body temperature
* Heart rate

**Thyroxin(T4):**

•Control developement and maturation

•Excess thyroxin results rapid development

•Deficiency pf thyroxin results in delayed development

**Calcitonin:**

It is hormone secreted by the C cell of the thyroid gland.

**Function:**

. It increase bone calcium

. It decreases blood calcium level

**3. Adrenal gland**

The adrenal glands (also known as suprarenal glands) are endocrine glands that produce a variety of hormones including adrenaline and the steroids aldosterone and cortisol.

**Location:**

They are found above the kidneys.

**Structure**

Adrenal gland, also called suprarenal gland, either of two small triangular endocrine glands one of which is located above each kidney. Each gland consists of two parts: an inner medulla, which produces epinephrine and norepinephrine (adrenaline and noradrenaline), and an outer cortex, which produces steroid hormones.

**Function:**

Each adrenal gland is composed of two distinct parts: the outer part called the adrenal cortex and the inner adrenal medulla. The adrenal glands secrete different hormones which act as 'chemical messengers'. These hormones travel in the bloodstream and act on various body tissues to enable them to function correctly. All adrenocortical hormones are steroid compounds made from cholesterol

**Hormones**

The adrenal cortex produces three hormones:

**Mineralocorticoids:** the most important of which is aldosterone. This hormone helps to maintain the body’s salt and water levels which, in turn, regulates blood pressure. Without aldosterone, the kidney loses excessive amounts of salt (sodium) and, consequently, water, leading to severe dehydration and low blood pressure.

**Glucocorticoids:** predominantly cortisol. This hormone is involved in the response to illness and also helps to regulate body metabolism. Cortisol stimulates glucose production helping the body to free up the necessary ingredients from storage (fat and muscle) to make glucose. Cortisol also has significant anti-inflammatory effects.

**Adrenal androgens:** male sex hormones mainly dehydroepiandrosterone (DHEA) and testosterone. All have weak effects, but play a role in early development of the male sex organs in childhood, and female body hair during puberty.

Adrenocorticotropic hormone (ACTH), secreted by the anterior pituitary gland, primarily affects release of glucocorticoids and adrenal androgens by the adrenal gland and, to a much lesser extent, also stimulates aldosterone release.

**The adrenal medulla produces catecholamines:**

Catecholamines include adrenaline, noradrenaline and small amounts of dopamine – these hormones are responsible for all the physiological characteristics of the stress response, the so called 'fight or flight' response.

4. Difference between the  cortex and medulla

**Parts of the adrenal gland:**

 It has two parts:

•outer part is ***cortex***and

•the inner part is ***medulla.***

**Adrenal cortex:**

     It produces three hormones:

•Glucocorticoids

•Mineralocorticoids

•Sex hormones (androgens)

These are collectively called  as***adrenocorticoids***

**A. Glucocorticoids**

 ***Cortisol,***is the mainGlucocorticoids

•They are essential for life,  regulating metabolism and stress

**Effects:**

* Have an anti-inflammatory action.
* Suppress the immune system
* Suppress the response of tissue to injury
* Delay wound healing

**B. Mineralocorticoids:**

**• *Aldosterone***is the  mainmineralocorticoids

• It maintains

Water and electrolyte balance

**C • Sex hormones:**

***Androgens***are the main sex hormones

•They contribute to the onset of puberty

**Adrenal medulla:**

 It is surrounded by the cortex

 It produces two hormones

•***adrenaline*and**

•***noradrenaline****.*

**Adrenaline and noradrenaline:**

***Noradrenaline***and ***adrenaline***are released into the blood

•They are structurally very similar and have similar effects

•Together they potentiate by:

•Increasing heart rate

•Increasing blood pressure

•Increasing metabolic rate

•Dilating the pupils

Note:

I. Make an assignment in PowerPoint.

II. Short and to the point.