CONTROL AND CO-ORDINATION

Thyroid and Parathyroid Gland

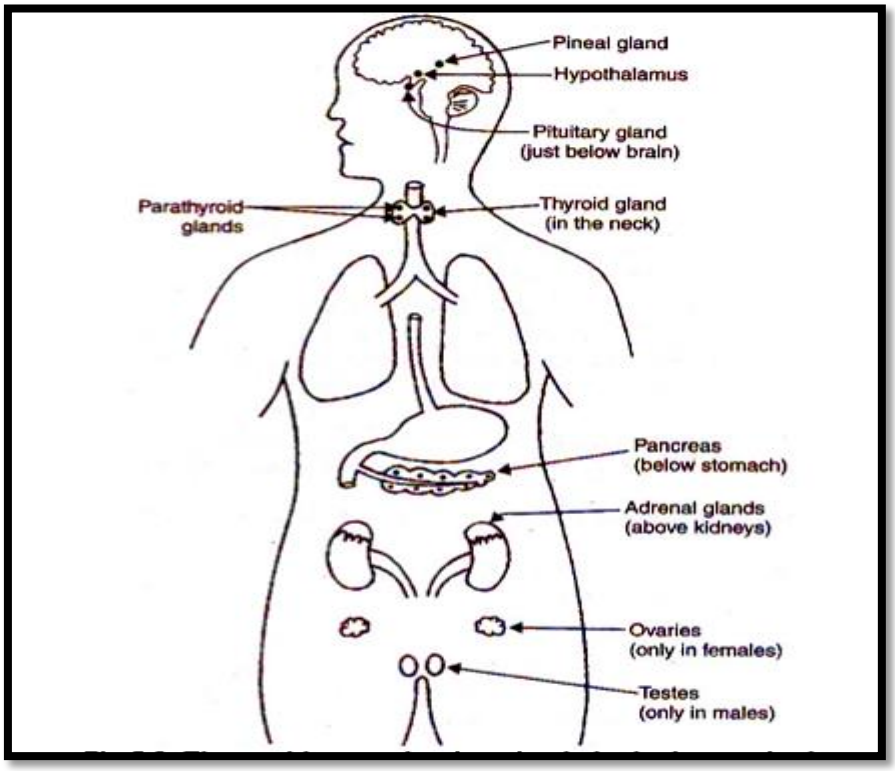
❖ ENDOCRINE SYSTEM:

A group of endocrine glands which produces various hormones is called as endocrine system.

The endocrine glands present in the human body are:

(a) hypothalamus gland
(b) pituitary gland
(c) pineal gland
(d) thyroid gland
(e) parathyroid glands
(f) thymus
(g) adrenal glands
(h) pancreas
(i) ovaries (only in females)
(j) testes (only in males)

the hormones produced by endocrine glands act as messengers between the nervous system and the organs of our body.



THE POSITIONS ENDOCRINE GLANDS IN THE HUMAN BODY.

❖ Pancreas

The pancreas is an endocrine as well as an exocrine gland. That is why the Pancreas is also known as a mixed gland. The pancreas secretes hormones like glucagon and insulin; these two

hormones balance the blood sugar level in the body. Other hormones secreted are somatostatin and pancreatic polypeptide.

❖ Thyroid Gland

The thyroid gland consists of two lobes joined together by an isthmus.
It is situated in the lower part of the neck and when enlarged it forms goitre.
Two hormones secreted by the thyroid gland are:
Thyroxine: It is the principal hormone secreted by the thyroid gland.
Its main role is to increase the metabolic rate of the organs and tissues of the whole body.
The basal metabolic rate (B.M.R.) is increased in hyperthyroidism and reduced in hypothyroidism.

Hypothyroidism: Myxoedema is the condition caused by thyroid hormone deficiency in adults.
Cretinism affects children and is due to congenital defect of either absence or defect of the gland. Iodine deficiency causes simple goitre.

Hyperthyroidism:

Excessive amount of thyroxine is poured into the blood this condition being known as toxic goitre or exophthalamic goitre (grave's disease).

Calcitonin:

This hormone lowers the blood calcium level in two ways:

- By inhibiting renal tubular calcium reabsorption.
- By raising calcium reabsorption by bones.

❖ Parathyroid Gland:

These are small ovoid pea shaped glands. They lie on the posterior surface of the thyroid gland.
The parathyroid secretion, parathormone (Collip's hormone) has two main functions:
it regulates the balance between the calcium in bones and in extracellular tissue fluid, thus affecting the amount of calcium in the blood.
It increases the blood calcium level.
it also controls the excretion of phosphates in the urine, probably by reducing tubular reabsorption of phosphorus by the kidney tubule.

❖ Thymus Gland:

This gland is situated in the thorax in midline under the sternum in front of trachea. It secretes a hormone namely thymosin. It helps in producing T-lymphocytes.

❖ Adrenal Gland:

These are two small semilunar structures lying one each on upper pole of the kidneys. That is why they are also known as supra renal glands.
Each gland consists of two structurally & physiologically separate parts known as cortex and medulla.

Cortex secretes three different kinds of hormones known as corticosteroids.
They are:

(I) **Mineralocorticoids:** These regulate sodium and potassium balance in the body.

(II) **Glucocorticoids:** These derive their name from their influence on carbohydrate metabolism. e.g. Glycogenesis is promoted in liver.

(III) **Sex hormones**: Small quantities of sex hormones as androgens and oestrogen are produced by adrenal glands which influence sexual development and growth.

Adrenal medulla: It secretes two hormones.

(I) **Adrenaline:** it is a stress hormone causes increase in systolic blood pressure, dilation of coronary blood vessels, increased sweating and increase in metabolic rate. It brings restlessness, muscle fatigue and anxiety.

(II) **Noradrenaline:** It is a general vasoconstrictor, increases both systolic and diastolic pressures.

- Both of these hormones are helpful in emergency conditions. Thus are called as "fight or flight response" or 3F's.

❖ Function of Hormones

Following are some important functions of hormones:

- Food metabolism.
- Growth and development.
- Controlling thirst and hunger.
- Maintaining body temperature.
- Regulating mood and cognitive functions.
- Initiating and maintaining sexual development