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Unit - 4.

Endocrine System.

— for the body to function properly there should be a proper communication between the various parts and organs so that internal environment is maintained.

There are 2 systems which ensure communication
- nervous system
- hormonal system.

Nervous system generally allows rapid transmission of information between different body regions

Hormonal sys communication, which relies on the production and release of hormones from various glands and on the transport of those hormones via the blood stream

Thus 2 systems complement each other.

In addition both systems interact: stimuli from nervous system can influence the release of certain hormones and viceversa

Hormones.

(7) Hormones are molecules produced by endocrine glands, including hypothalamus, pitulary glands, adrenal glands, gonads, pancreas, thyroid glands, parathyroid glands.

The term "endocrine" implies that in response to specific stimuli the products of those glands are released in to the blood stream.

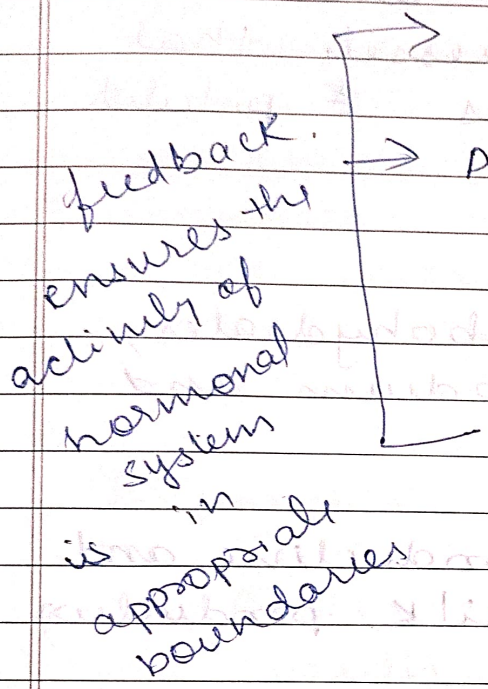
The hormones then are carried via blood to the targelled cell.

Some hormones have only a few specially targetted cells where as others hormone affect numerous cell types throughout the body.

The target cells for each hormone is characterized by the receptor placed either on the surface of the cell or inside the cell.

To maintain body homeostasis and respond appropriately to changes in environment, hormone production and secretion must be tightly controlled

To achieve this control, many bodily functions are regulated not by a single hormone but by several hormones that regulate each other



Hypothalamus and its hormones.

- small region located in brain that controls many bodily functions including drinking, eating, sexual functions BP, heart etc.
- Hypothalamus hormones plays imporle in this regulation of many of ther functions.

- Part CNS so the hormones are produced by neurons.
- The signal from other neurons can modulate the release of hormones, so hypothalamus serves and imp link bhw NS and Endo. System

For eg - hypo. receives signals from higher brain centres that responds to the various environmental signals

— Hypoth. hormones are released to the blood vessels that connect hypothalamus & pituitary gland.

Hormones

- CRH - regulating carbohydrates, metabolism of fats, proteins, sodium and water balance.
- GnRH - help, control reproductive and sexual functions and milk production
- TRH. controlling metabolic processes of all cells.
- GHRH - promoting organisms growth.
- Dopamine -

Pitutary and its hormones.

— size of small marble just below the hypothalamus in the brain
2 parts
① Anterior
② Posterior.

Anterior pitulary

— produces several imp hormones that either stimulate target glands to produce target gland hormones or directly affect target gland.

Important hormons
— TSH - stimulate the release of thyroid hormo by thyroid gland
— ACTH - stimulate adernal cortex to release horm
— Growth hormone
— Prolactin

Growth hormone is the most abundant hormone plays a pivotal role in controlling body's growth and development
— GH indirectly stimulate release of insulin from liver and kidney

Prolactin in women plays role in breast development and after child birth maintanence of lactation
In men not well understood although high high prolactin reduce sex drive.

Posterior pituitary :-

Does not produce its own hormone but stores 2 hormones produced by neurones of hypothalamus
- Vasopressin (AVP)
- Oxytocin.

Vasopressin (AVP) plays imp role in the body fluids and electrolyte economy. It promotes the reabsorption of water from the urine in the kidneys. Through this urine production is reduced and conservation of water.

Oxytocin stimulates the contraction of the uterus during childbirth hormone activates milk ejection in response to infant sucking.

Adrenal Glands

- Small structures located on top of the kidneys
- Structurally consist of outer layer (cortex) and inner layer (medulla)
- produces numerous hormones primarily corticosteroides (glucocorticoids) and mineralocorti
- cortex is also the source of sex hormon and amount is insignificant as compared to amount produced by ovaries and testes. (small)
- medulla produces 2 substances (adrenaline and noradrenaline - release as fight or flight response to various stress factors.

glucocorticoids → in human is cortisol. controls carbohydrates, protein lipid metabolism. → protect body from stress trauma & infection injur

if the cortisol level cannot be increased then small stress can also be fatal for them

- mineral corticoids regulate water and electrolytes in body (balance)