ENDOCRINE FUNCTIONS OF OTHER ORGANS

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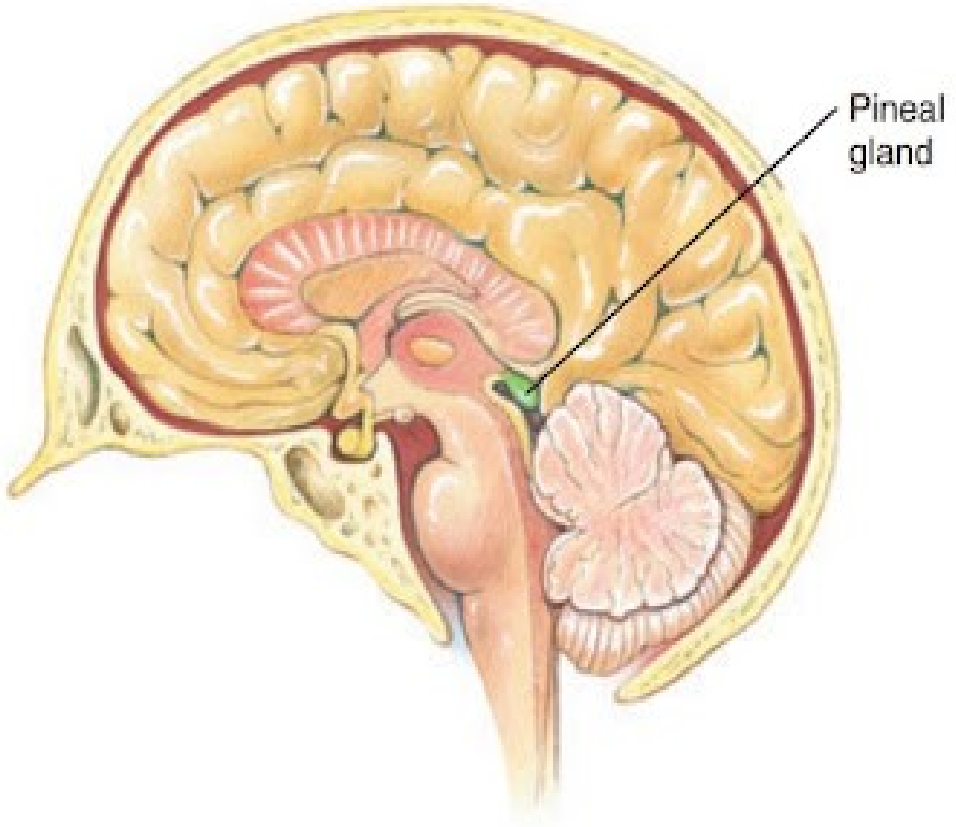
PINEAL GLAND

- Pineal gland or **epiphysis** is located in the diencephalic area of brain above the hypothalamus.
- It is a small cone shaped structure with a length of about 10 mm.
- In adults, the pineal gland is **calcified.** However, they secrete the hormonal substance.



FUNCTIONS

- Pineal gland has two functions:

1. It controls the sexual activities in animals by regulating the seasonal fertility. However, the pineal gland plays little role in regulating the sexual functions in human being.
2. It secretes the hormonal substance called **Melatonin**.

MELATONIN

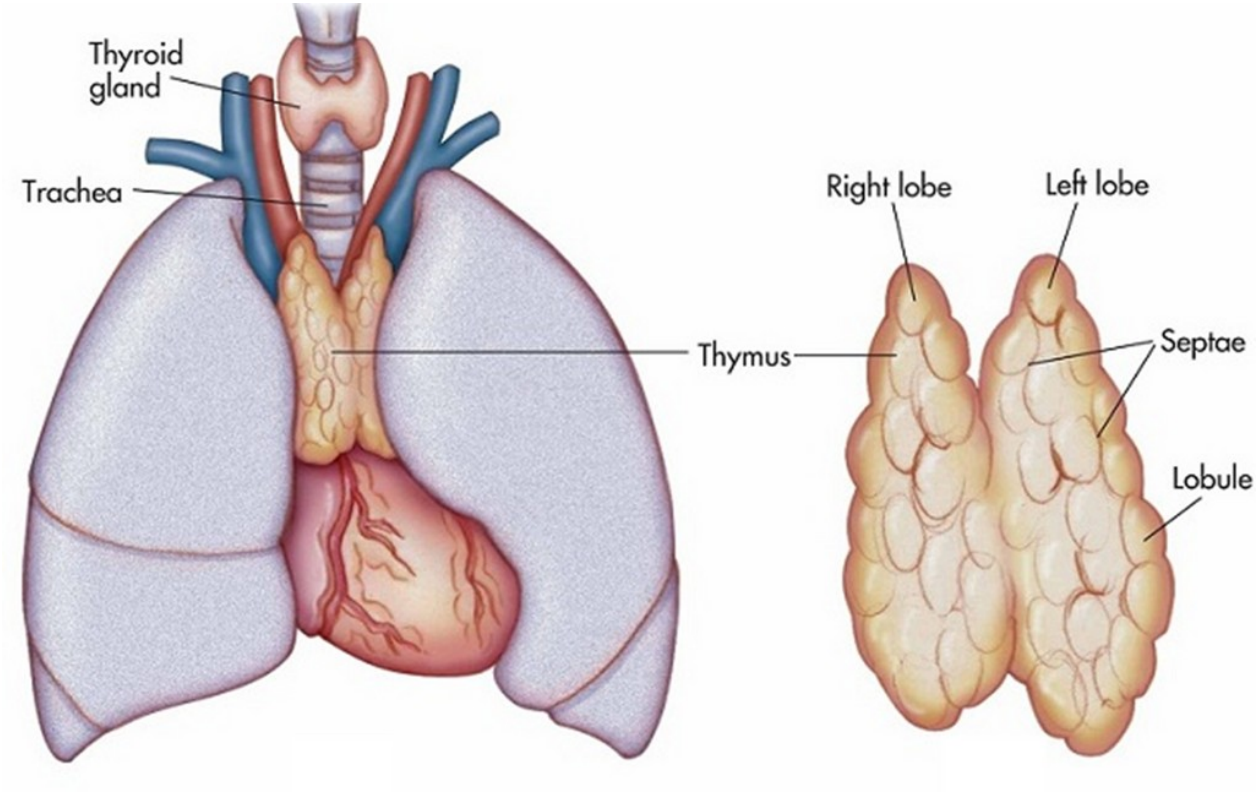
- Melatonin acts mainly on gonads.
- In some animals, it stimulates the gonads while in other animals, it inhibits the gonads.
- In humans, it inhibits the onset of puberty by inhibiting the gonads.

DIURNAL VARIATION IN MELATONIN SECRETION

- Melatonin secretion is more in darkness than in daylight.
- In animals, the secretion of melatonin varies according to activities in different periods of the day, i.e. **circadian rhythm**.
- Hypothalamus is responsible for the circadian fluctuations of melatonin secretion.

THYMUS

- Thymus is situated in front of trachea, below the thyroid gland.
- Thymus is small in newborn infants and gradually enlarges till puberty and then decreases in size.



FUNCTIONS

- Thymus has lymphoid function and endocrine function.
- It plays an important role in development of immunity in the body.
- Thymus has two functions:

1. PROCESSING THE T LYMPHOCYTES

- Thymus plays an essential role in the development of immunity by processing the T lymphocytes.

- The lymphocytes which are produced in bone marrow are processed in thymus into T lymphocytes.
- It occurs during the period between 3 months before birth and 3 months after birth.
- So, the removal of thymus 3 months after birth, will not affect the cell-mediated immunity.

ENDOCRINE FUNCTION OF THYMUS

- Thymus secretes two hormones:

1. THYMOSIN

- It accelerates lymphopoiesis and proliferation of T lymphocytes.

2. THYMIN

- It suppresses the neuromuscular activity by inhibiting acetylcholine release.
- Hyperactivity of thymus causes myasthenia gravis.

KIDNEYS

- Kidneys secrete five hormonal substances:

1. Erythropoietin
2. Thrombopoietin
3. Renin
4. 1,25-dihydroxycholecalciferol (calcitriol)
5. Prostaglandins.

1. ERYTHROPOIETIN

- Erythropoietin stimulates the bone marrow and causes erythropoiesis.

2. THROMBOPOIETIN

- Thrombopoietin stimulates the production of platelets.

3. RENIN

- Renin converts angiotensinogen into angiotensin I, which is converted into angiotensin II by a converting enzyme.
- Along with angiotensins, renin forms the renin-angiotensin system which plays an important role in the maintenance of blood pressure

4. CALCITRIOL (1,25-DIHYDROXYCHOLECALCIFEROL)

- 1,25-dihydroxycholecalciferol is otherwise known as **calcitriol** or **activated vitamin D.**
- The activated vitamin D plays an important role in the maintenance of blood calcium level.
- It acts on the intestinal epithelium and enhances absorption of calcium from intestine into the blood.

5. PROSTAGLANDINS

- Prostaglandins decrease the blood pressure by systemic vasodilatation, diuresis and natriuresis.

HEART

- Heart secretes the hormones atrial natriuretic peptide and brain natriuretic peptide.

1. ATRIAL NATRIURETIC PEPTIDE

- It is secreted by **atrial musculature** of the heart.
- ANP, in turn increases excretion of sodium through urine and helps in the maintenance of extracellular fluid (ECF) volume and blood volume.
- It also lowers blood pressure.

2. BRAIN NATRIURETIC PEPTIDE

- It is secreted by the cardiac muscle.
- It is also secreted in some parts of the brain.
- BNP has same actions of ANP.
- On brain, its actions are not known.


THANKS!