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# SSC MTS Exam

Study Material for Genral Awareness

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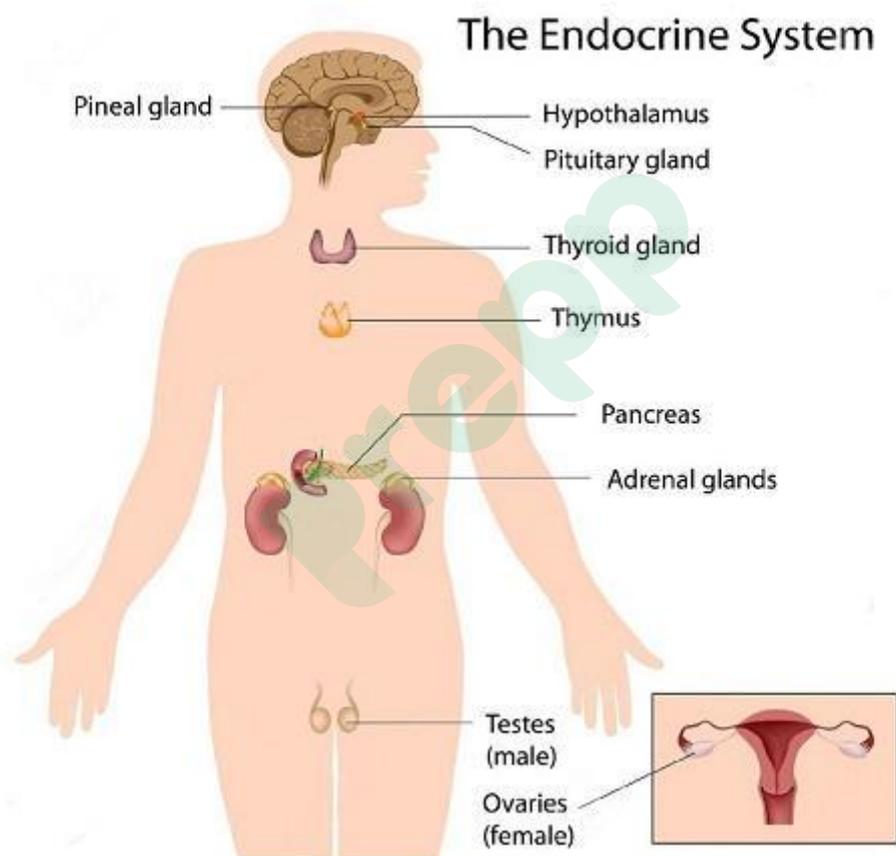


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# ENDOCRINE SYSTEM

## Introduction

- The endocrine system is study of the glands of an organism that secrete hormones directly into the circulatory system.
- The organs through which the life running hormones are secreted are known as endocrine glands or simply ductless glands.
- The hormone secreting glands are located in different parts of a human body (see the image given below).
- The scientific study of the endocrine system and its disorders is known as **endocrinology**.



## Hormone

- The hormone is a complex but very important chemical substance released by the different glands in the body.
- The hormone is mainly made up of amino acid, catecholemines, and steroids.
- It is the hormone which is responsible for the overall growth and development; safety and security; behavior, sexual characteristics, and reproductive activities of a human body.

## Types of Endocrine System

Following are the major types of endocrine system –

- Hypothalamus
- Pineal Gland
- Pituitary Gland
- Thyroid Gland
- Parathyroid Gland
- Adrenal Gland
- Pancreas Gland
- Reproductive Gland (Ovaries & Testes Glands)

### Hypothalamus

- It is located at the base of the brain.
- It releases Growth hormone-releasing hormone, Somatostatin hormone, etc., important for the growth.

### Pineal Gland

- It is located at the base of the brain.
- It releases melatonin hormone helpful in lowering the core body temperature.

### Pituitary Gland

- With the size of a pea, the pituitary gland is found at the base of the human brain.
- The average weight of pituitary gland is about 0.5 grams.
- It is also known as hypophysis.
- Following are the hormones secreted by the pituitary gland –
  - **Growth hormone** (somatotropin) – It is abbreviated as GH and it stimulates growth and cell reproduction.
  - **Thyroid-stimulating hormone** (thyrotropin) – It is abbreviated as THS and it stimulates iodine absorption by thyroid gland.
  - **Adrenocorticotrophic hormone** (corticotropin) – It is abbreviated as ACTH and it stimulates corticosteroid and androgen.
  - **Beta-endorphin** – it inhibits perception of pain.
  - **Prolactin** – it stimulates milk synthesis and release from mammary glands.

### Thyroid Gland

- Thyroid gland is located just below the larynx in the throat (pharynx).
- The hormone secreted by the thyroid gland is known as thyroxine.
- Following are the important hormones secreted by the thyroid gland –
  - **Triiodothyronine**(T3) – It stimulated body oxygen and energy consumption. It also promotes protein synthesis.
  - **Thyroxine** – It increases the basal metabolic rate.
  - **Calcitonin** – It stimulates osteoblasts and bone construction.

### Parathyroid Gland

- It is located in the neck of a human body.
- It releases parathyroid hormone that helps in regulating the amount of calcium in the blood as well as within the bones.

### Adrenal Gland

- Adrenal gland is found above the kidneys.
- It releases the following major hormones –
  - **Glucocorticoids** – It stimulates gluconeogenesis and fat-breakdown in adipose tissue.
  - **Mineralocorticoids** – It stimulates active sodium reabsorption in kidneys.
  - **Adrenaline** – It increases the supply of oxygen and glucose to the brain and muscles.
  - **Dopamine** – It increases heart rate and blood pressure.
  - **Enkephalin** – It regulates pain.

### Pancreas Gland

- Pancreas gland is located in the abdominal cavity (behind the stomach).
- Pancreas is a mixocrine gland, as it releases both enzymes and hormones.
- It releases the following major hormones –
  - **Insulin** – It regulates the metabolism of carbohydrates, proteins, and fats.
  - **Glucagon** – It raises the concentration of glucose in the bloodstream.
  - **Somatostatin** – It inhibits release of insulin and glucagon.

### Reproductive Gland

- The reproductive gland is classified as Testes in Male and Ovary in Female.
- Testes releases androgens (hormone) that help in strengthening muscle, increasing bone density, maturation of sex organs.
- Ovary releases progesterone hormone that helps during pregnancy period.

## Endocrine Diseases

Glucose Homeostasis Disorders		
Diseases	Types	Result
Diabetes Mellitus	Type 1 Diabetes	Increases sugar levels
	Type 2 Diabetes	
	Gestational Diabetes	
Hypoglycemia	Idiopathic hypoglycaemia	Decreases sugar level (below normal)

	Insulinoma	
Glucagonoma	Cause: Because of the overproduction of glucagon hormone	Tumour of the pancreas
<b>Thyroid Disorders</b>		
Goiter	Cause: deficiency of iodine	swelling of the neck or larynx
Hyperthyroidism (excessive production of thyroid hormone)	Graves-Basedow disease	Muscle weakness, sleeping problems, diarrhea, weight loss, etc.
Hypothyroidism (low release of thyroid hormone)		Poor ability to tolerate cold, a feeling of tiredness, constipation, depression, and weight gain
Thyroiditis	Hashimoto's thyroiditis	Inflammation of the thyroid gland
Thyroid cancer		Nodule in the thyroid region of the neck
<b>Metabolic Bone Disease</b>		
Parathyroid gland disorders	Primary hyperparathyroidism	Alterations in the blood calcium levels and bone metabolism
	Secondary hyperparathyroidism	
	Tertiary hyperparathyroidism	
	Hypoparathyroidism	
Osteoporosis		Bone weakness
Paget's disease of bone		Weakening of bones
Rickets and Osteomalacia		Child disease (because of vitamin D deficiency)
<b>Pituitary Gland Disorders</b>		
Diabetes insipidus		Excessive thirst and excretion of large amounts of severely dilute urine
Hypopituitarism		
Pituitary tumors	Pituitary adenomas	
	Prolactinoma	
	Acromegaly	
	Cushing's disease	
<b>Sex Hormone Disorders</b>		
Intersex disorders	Hermaphroditism	
	Gonadal dysgenesis	
	Androgen insensitivity syndromes	

Genetic and chromosomal disorders	Kallmann syndrome	
	Klinefelter syndrome	
	Turner syndrome	
Acquired disorders	Ovarian failure	
	Testicular failure	
Disorders of Puberty	Delayed puberty	
	Precocious puberty	
Menstrual function or fertility disorders	Amenorrhea	
	Polycystic ovary syndrome	

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