

Topic of the lesson: **PATHOPHYSIOLOGY OF ENDOCRINE SYSTEM. DISTURBANCES OF HYPOPHYSIS AND ADRENAL GLANDS.**

Aim: To study properties and mechanism of action true hormones – products of activity of different endocrine glands, their classification, types of disturbances of endocrine functions. To study which factors may cause disturbance of function of hypothalamo-adrenohypophyseal system and which pathological conditions may arise at the disturbance of this system.

Main questions over the topic of lesson:

1. Pathogenic variants of endocrine system disturbances (deregulatory, gland, peripheral) and their causes.
2. Hypo-, hyperpituitarism, characteristic.
3. Characteristic of main syndromes – secondary hypogonadism, hypothyroidism, hypocorticism, depigmentation, disturbance of lactation at the labor, diabetes insipidus.
4. Hyper-, hypofunction of adrenal glands cortex. Hyperaldosteronism. Syndrome and disease of Itsenko-Cushing, adrenogenital syndrome.
5. Disturbances of medullary substance of adrenal glands.

Literature:

1. General and clinical pathophysiology/ Gozhenko A.I. et al. – Odessa National Medical University. – 2001. – P. 194-211
2. Pathophysiology/ Gozhenko A.I., Gurkalova I.P. - Odessa National Medical University. – 2003. – P. 290-302

CONTROL QUESTIONS

№ №	Instructions to the execution of the task	Answers of the students with complements at the lessons
1.	How are endocrine functions regulated? – a, b, c, d	

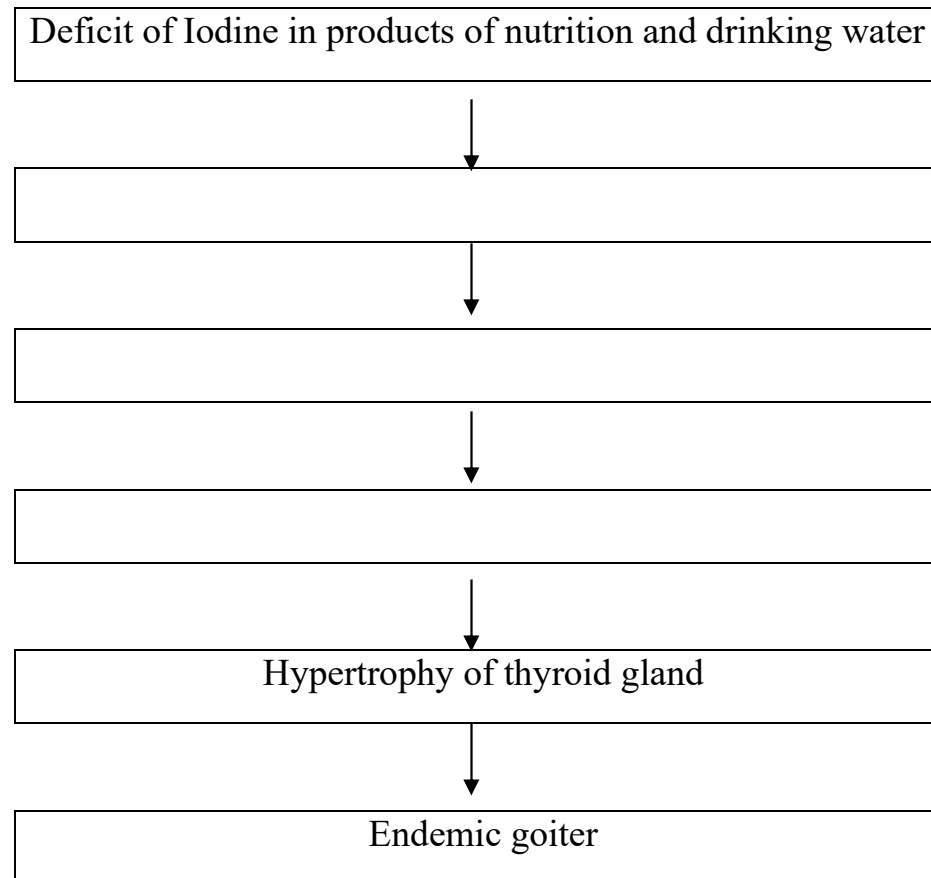
2.	Which principles are in basis of regulation of endocrine functions? – a, b	
3.	Name causes of disturbances of hypothalamo-adrenohypophisal system. – a, b, c, d, e	
4.	Which hormones are formed in adenohypophysis? Which biological effects do they poses?	
5.	What is hypopituitarism? What are its forms? What does it declare by?	
6.	Which syndromes are developed at panhypopituitarism? – a, b, c	
7.	What is hyperpituitarism? What may be it	

	caused by? Which syndromes are known?	
8.	Which hormones does neurohypophysis develop? – a, b Which biological effects do they poses?	
9.	Give the characteristic of disturbances connected with pathology of hypothalamo-neurohypophisal system.	
10.	Which hormones are formed in cortex of adrenal glands?	
11.	What may cause disturbances of cortex of adrenal gland?	
12.	Name manifestations, caused by disturbance of glucocorticoid function of adrenal glands.	

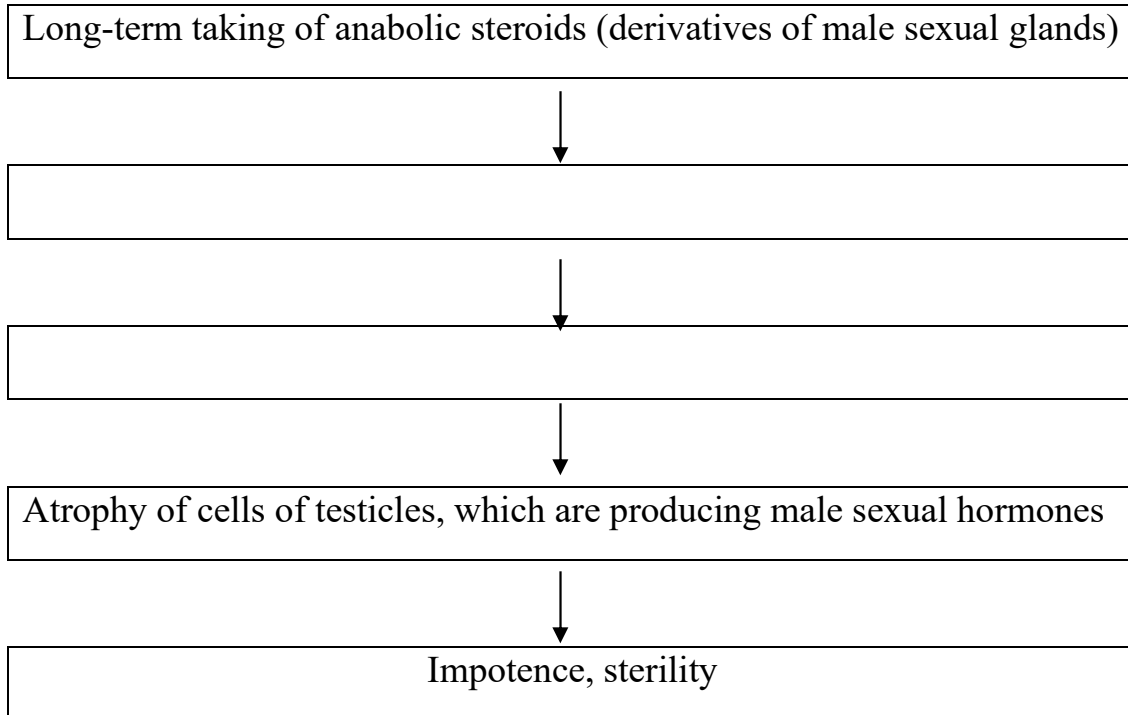
13.	Which are manifestations of insufficiency of mineralocorticoids production?	
14.	What is hyperaldosteronism? Name types and manifestations.	
15.	Name forms of hyperfunction of cortex fascicular zone and main manifestations.	
16.	What is adrenogenital syndrome?	
17.	What are mechanisms of hormones action of medullar substance of adrenal glands?	
18.	How does declare hypo- and hyperfunctional condition of medullar substance of adrenal glands?	

TASK 1. *Make scheme of disturbance of links of reverse systems:*

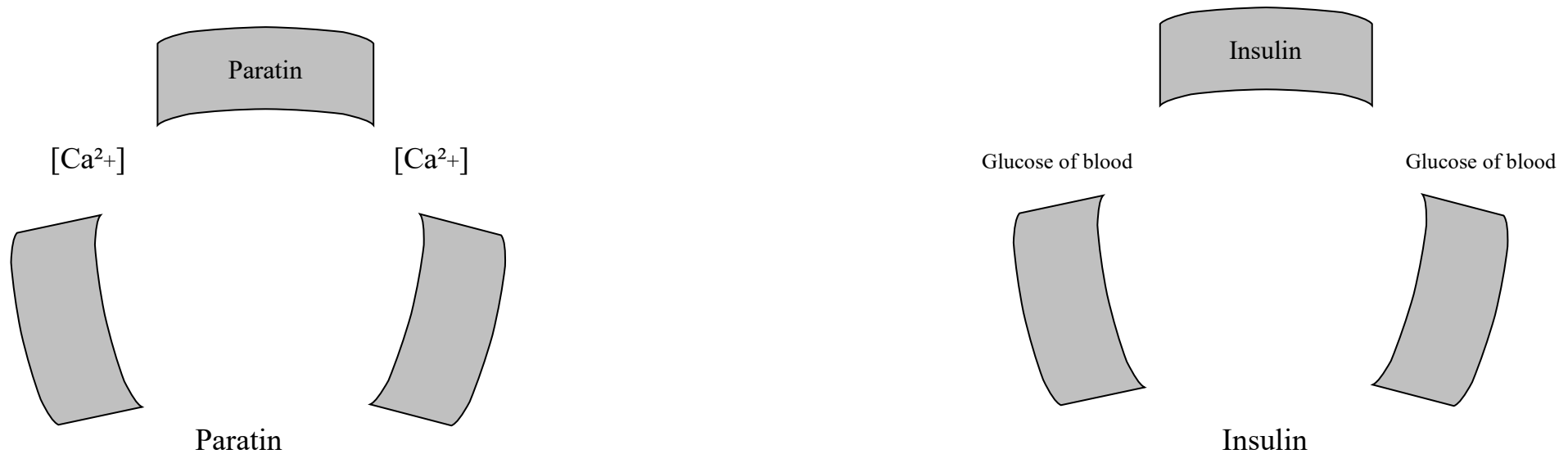
A. Hypothalamus – adenohypophysis – thyroid gland



B. Hypothalamus – adenohypophysis – sexual glands



TASK 2. Sign with arrows leading role of shot reverse links in regulation of activity of parathyroid gland and β -cells of pancreas islands.



TASK 3. Fill in the table, which describes disturbances of homeostasis at pathology of hypothalamo-neurohypophyseal system (supraoptical and paraventricular nuclei).

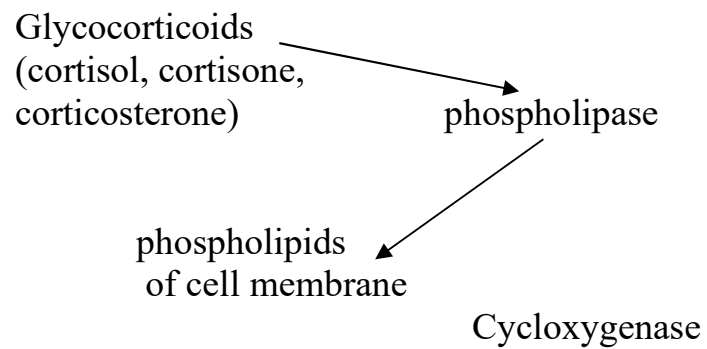
Parameters of homeostasis	Vasopressin	
	norm	hyperproduction
Osmotic pressure		
Volume of circulating blood		
Arterial pressure		

Rate of glucose in blood		

TASK 4. *Glucocorticoids, which are using in clinic as anti-inflammatory and anti-allergic preparations, in large doses stimulate formation of lipocortin in cells, which inhibits intracellular synthesis of phospholipase and after stops arachidone cascade. Sine, blockade of which biological active substances (BAS) provides lipocortin effects of glucocorticoids and their mechanism.*

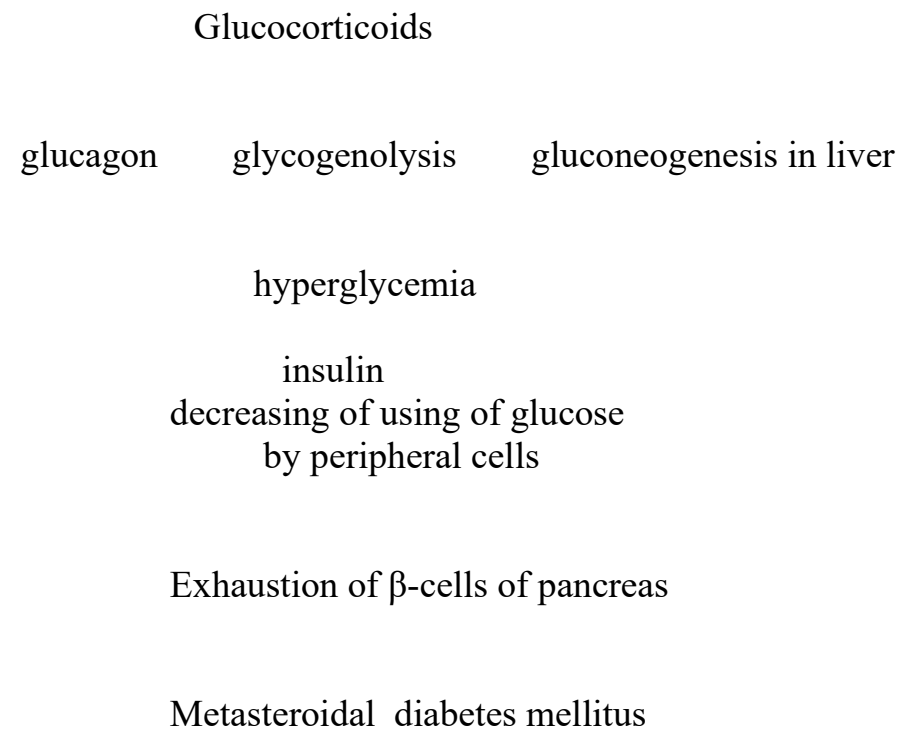
Effects	BAS of arachidone cascade, mechanism
Anti-inflammatory	
Anti-allergic	
Anti-pyretic	
Gastric hypersecretion	
Anti-aggregatory (anticoagulance, hemolytic effect)	
Hypertensial	

TASK 5. *Image schematically and sign links at 1) disturbance of arachidone cascade and 2) development of metasteroideal diabetes mellitus.*



arachidone cascade

BAS



TASK 6-9. *To solve clinic-patophysiological tasks.*

Task 1. At X-Ray investigation of bones of skull basis were researched increasing and destruction of cavity of Turkish saddle.

Tumor of which endocrine gland may cause such destruction of bones?

- A. hypophysis
- B. epiphysis
- C. adrenal glands
- D. thymus
- E. thyroid gland

Task 2. Patient, 50 years old, is complaining on increasing of appetite, thirst, reduction of weight of the body, fatigue. At laboratory examination were evident increasing of sugar amount in blood. With disturbance of function of which cells is connected development of this disease?

- a. hepatocytes
- b. α –cells of pancreas
- c. thyrocytes
- d. lipoproteins
- e. β –cells of pancreas

Task 3. At patient of 35 years old, which is suffering with system lupus erythematosus after long-term glucocorticoid therapy has appeared vessel insufficiency. It can be explained by decreasing of secretion of:

- A. aldosterone
- B. corticotrophin
- C. adrenalin
- D. cortisol
- E. corticoliberin

Task 4. At the patient, which for a long time were treated because of collagenosis with corticosteroid hormones, appeared quick physical and psychical fatigue, arterial hypotension, weight loss, progressing hyperpigmentation of skin. What is in the base of this symptom complex?

- A. chronic hypofunction of medullar substance
- B. acute hyperfunction of cortical substance of adrenal glands
- C. chronic hyperfunction of cortical substance of adrenal glands
- D. acute hypofunction of cortical substance of adrenal glands
- E. chronic hypofunction of cortical substance of adrenal glands

F.

G.

TASK 10. *To solve tests for selfcontrol*

1. Stature of 10 years old child is 178 sm, weight 64 kg. With disturbance of activity of which endocrine gland is it connected?

- A. adrenal glands
- B. thyroid gland
- C. sexual glands
- D. hypophysis
- E. parathyroid gland

2. At the visit to the doctor came patient with very high stature, with long fingers of the hands, large lower jaw and dropping lower lip. Increased secretion of which hormone of which gland may be suspected?

- A. hormones of thyroid gland
- B. somatotrophic hormone
- C. gonadotropic hormone
- D. hormones of adrenal glands cortex
- E. hormones of adrenal glands medullary substance

3. At clinical examination at woman was evident increasing of sweating, tachycardia, sharp weight loss, exophthalmoses. Function of which

endocrine gland is disturbed and in which endocrine gland is disturbed and in which direction?

- A. sexual glands, hyperfunction
- B. thyroid gland, hypofunction
- C. thyroid gland, hyperfunction
- D. pancreas, hypofunction
- E. medullary substance of adrenal glands, hyperfunction

4. After systematic usage of androgynous hormones at athlete was diagnosed atrophy of testicles. It is caused by:

- A. gonadoliberin
- B. testosterone
- C. prolactoliberin
- D. corticoliberin
- E. gonadotropin

5. At the patient with pheochromocytoma after emotional overstrain appears tachycardia, is increased arterial pressure, appears sharp pain in upper abdomen region. These attacks may be explained by:

- A. releasing of adrenalin by sympathetic nerves
- B. massive emission of catecholamines with adrenal glands

C. activation of active nuclei of hypothalamus

D. increasing of secretion of thyroid hormones

E. increasing of synthesis of adrenocorticotrophic hormone

6. At patient M., 50 years old, were detected increasing of sizes of hypophysis, hyperplasia of adrenal glands cortex, AP – 190/90 mm Hg cm; amount of glucose in blood 20 mmol/l, glucosuria. Obesity, hirsutism. For which pathology are typical such changes?

- A. Addison disease
- B. Itsenko-Cushing disease
- C. Itsenko-Cushing syndrome
- D. adiposogenital dystrophy
- E. Kohn syndrome

7. At the girl of 5 years old had appeared symptoms of injured puberty: menstruation, growth of mammary glands, deposition of fat in region of pelvis and hips. More probable cause of premature puberty is:

- A. hormonal active tumor of ovary
- B. hyperplasia of adrenal glands

- C. adenoma of adrenal glands
- D. syndrome of polycystosis ovaries
- E. pheochromocytoma

8. Patient N. of 50 years old, during 10 years is suffering from tuberculosis of lungs. Abuses with an alcohol. For last time have appeared complaints on irritation, quick fatigue, syncope, muscular weakness, loss of weight. Objective: hyperpigmentation of skin, arterial pressure 90/60 mm. Hg. cm. What has caused development of disease at this patient?

- A. injury of thyroid gland
- B. tumor of hypothalamus
- C. chronic alcohol intoxication
- D. tuberculosis injury of adrenal glands
- E. alcohol injury of liver

9. At patient of 25 years old, after removing of adrenal gland suddenly decreased arterial pressure – 70/40 pulse frequent of weak filling, cold sweat, vomiting, mm. Hg. cm., pulse frequent of weak filling, cold sweat, vomiting, hypotension, convulsions. Disturbance of function of which gland has caused such state?

- A. hypertrophy of right adrenal gland

- B. hyperfunction of neurohypophysis
- C. atrophy of right adrenal gland
- D. hypofunction of neurohypophysis
- E. hypofunction of adenohypophysis

10. Woman of 44 years old, is complaining on general fatigue, pain in region of heart, a great increasing of weight. Objective: moon-like face, hirsutism, arterial pressure 165/100 mm. Hg. cm., stature 165 sm, weight of the body 103 kg, accumulation of fat mainly on a neck, shoulder girdle, abdomen. Main pathogenetic mechanism of obesity of woman is:

- A. increasing of glucocorticoids production
- B. decreasing of thyroid hormones production
- C. increasing of insulin production
- D. decreasing of glucagon production
- E. increasing of mineralocorticoids production

11. Woman of 38 years old is complaining on general fatigue, pain in region of heart, increased appetite, absence of menstruations. Objective: stature 166 sm, weight of the body 108 kg, moon-like face, localization of under skin fatty tissue mainly is in region of shoulder girdle, trunk; on a

skin of hips and abdomen are blood-red stripes, pulse 62 per minute, arterial pressure 160/105 mm. Hg. cm. For which of lower enumerated conditions is typical such type of obesity?

- A. myxedema
- B. Itsenko-Cushing disease
- C. alimentary obesity
- D. insulinoma
- E. Babinski-Fröhlich syndrome

12. Man of 45 years old is complaining on strong headaches, general fatigue, and vertigo. Objective: arterial pressure 180/100 mm. Hg. cm. In blood: hypopotassemia. of constant character (less then 3 mmol/l), hyporeninemia. In urea: hyperaldosteronuria. With which diseases are enumerated disturbances connected?

- A. Konn syndrome
- B. essential hypertension
- C. Itsenko-Cushing syndrome
- D. diffuse glomerulonephritis
- E. pheochromocytoma

13. At boy of 5 years old, which earlier growth without deviations from age norms, has appeared pilosis by mail type, increased muscular mass. At examination were denominated secondary mail sexual characters. What is the cause of premature puberty?

- A. hormone-productive tumor of adrenal glands
- B. hormone-productive tumor of testicles
- C. increasing of gonadotropin production
- D. increasing of adrenocorticotropin production
- E. increasing of gonadoliberins production

14. Woman of 26 years old, is complaining on general fatigue, weight loss of 18 kg, menstruation absence; labor was difficult with bleeding. Objective: stature 168 sm, weight of the body 53 kg, hypoplasia of mammary glands. Was diagnosed Simmonds disease. What is the primary mechanism of disease development?

A. hypothyroidism

- B. decreasing of adenohipophysis hormones production
- C. decreasing of adrenal glands function
- D. decreasing of sexual glands function
- E. hypoparathyroidism

For notes
