

Theme of the lesson: PATHOPHYSIOLOGY OF DIGESTION IN ORAL CAVITY, STOMACH AND INTESTINE

Aim: To study etiology and pathogenesis of digestion system disorders, to form ability to lead pathophysiological analysis of clinical and model situations that are associated with digestion disorders.

Main questions:

1. Disorder of salivary glands function, causes and consequences.
2. Caries and parodontosis, main theories of etiology and pathogenesis.
3. Disorders of secretion and motion function of stomach.
4. Modern notion about etiology and pathogenesis of ulcerous disease
5. Disorder of digestion in intestine associated with pancreatic juice and bile secretion disorders.
6. Interconnection between cavitary and parietal digestion in the case of pathology.
7. Pancreatitis etiology and mechanism of development.
8. Syndromes of digestion and resorption disorders, causes, mechanisms, manifestations.

Literature:

1. General and clinical pathophysiology/Gozhenko A.I. - Odessa National Medical University. - 2002. - p. 169-179
2. Pathophysiology/Gozhenko A.I., Gurkalova I.P. - Odessa National Medical University. - 2003. - p. 258-265

CONTROL QUESTIONS

№	Pointings to the tasks fulfillment	Answers of the students with additions at the lessons
1.	Caries-is Main factors in caries development a, b, c, d, e, f	
2.	Parodontosis is-	

	Main factors in its development a, b, c	
3.	Hypersalivation is- Causes of it a, b, c, d Hyposalivation is- a, b, c, d, e	
4.	What is ulcerous disease? Name : a) risk factors a, b, c, d, e, f b) aggressive factors a, b, c, d c) protective factors of stomach tunica mucosa a, b, c, d, e, f	
5.	What is exogenous stomach ulcer? Causes of its development a, b, c Name links of pathogenetic activity of Helycobacter pylori a) first link of pathogenesis → b) second link of pathogenesis →	
6.	What is peptic ulcer?	

	Name links of pathogenesis of this ulcer under the neuro and humeral influence	
7.	What is trophic ulcer? Name links of pathogenesis of this ulcer associated with disorder of stomach innervation a) first link of pathogenesis → b) second link of pathogenesis →	
8.	What is acute pancreatitis? Name main etiological factors a, b, c, d, e, f Name links of pathogenesis of pancreatitis a, b, c, d and name main link of pathogenesis	
9.	What is intestinal obstruction Types of obstruction 1 a, b 2 a, b	
10.	Name changes in organism by intestinal obstruction a, b, c, d, e, f, g, h, I, g	
11.	What is malabsorption syndrome	

	Name main causes of it , b, c, d, e, f, g	
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TASK 1. Fill in a table, marking a sign «+» consequences of hypo and hypersalivation.

	hyposalivation	hypersalivation
Dehydration of organism		
Disorder of mastication and forming of bolus		
Trauma of tunica mucosa in oral cavity		
Reproduction of microorganisms		
Neutralization of stomach juice		
Disorder of trophical influence of saliva on teeth		

TASK 2. Compare the stage of stomach secretion with its characteristics

Secretion	answers	
1. Hypersecretion	1-	A. Resection of stomach B. Ulcer disease of stomach and duodenum C. Antral gastritis D. Acute and chronic gastritis E. decrease of digestive function of stomach juice F. Increase of digestive function of stomach juice G. Decrease of bactericidal function of HCl, developing of putrefaction and fermentation
2. Hyposecretion	2-	
3. Achylia	3-	

TASK 3. Fill in the table and compare causes and consequences of disorders of motion of stomach. Mark them with “+”.

Causes	Hypertensive dyskinesia of stomach	Hypotensive dyskinesia of stomach
Alimentary factors (fat meal)		
Decrease of stomach secretion		
Increase of stomach secretion		
Decrease of vagus tonus		
Increase of vagus tonus		
Activity of intestinal hormone- motilin and hystamine		
Activity of intestinal hormone- gastroinhibitative peptide, secretin, vasoactive intestinal polypeptide		
Irritation of sympathetic nerves		
Ulcerous lesion of stomach		
Pylorospasm		
Consequences of hypertensive and hypotensive dyskinesias		
Long-termed delay of meal in stomach and increase of stomach secretion. Development of obstipation		
Decrease of period that meal stays in stomach		
Development of antiperistalsis what leads to eructation, nausea, vomiting		
Increase of peristalsis of intestinum,		

TASK 4. Mark main signs of pancreatic shock

- a) Pain
- b) decrease of arterial pressure
- c) development of DIC syndrome
- d) hypoxic syndrome
- e) intoxication
- f) erythrocytosis

TASK 5. Enumerate signs of maldigestive syndrome

- a) steatorrhea
- b) hypovitaminosis A, E, K
- c) disorder of proteins digestion
- d) disorder of carbohydrates digestion
- e) disorder of nucleic acids digestion

TASK 6. Mark consequences of intestinal hyperkinesias and hypokinesias

- a) decrease of digestion and resorption
- b) amplification of digestion and resorption
- c) dehydration
- d) nongaseous acidosis
- e) diarrhea
- f) constipation
- g) meteorism
- h) intestinal intoxication

TASK 7-9. To solve clinicopathophysiological problems

Task 1. Lead the pathophysiological analyze of stomach secretion in 3 situations – Patients A, B, C

	Conditions	Volume ml	General acidity	Free HCl	Connected HCl	Pepsin
Norm	fasting	not more 50	up to 40	up to 20	-	0-21
	basal secretion	50-100	40-60	20-40	10-15	20-40
	stimulated secretion	50-100	40-60	20-40	10-15	21-45
Patient A	fasting	10	30	-	10	10
	basal secretion	-	-	-	-	-
	stimulated secretion	20	35	10	10	5
Patient B	fasting	100	60	30	20	15
	basal secretion	120	80	60	10	30
	stimulated secretion	140	100	50	30	50
Patient C	fasting	70	50	30	10	-
	basal secretion	120	60	30	15	-
	stimulated secretion	10	10	-	5	-

What type of stomach secretion disorders has patients A, B, C?

How does evacuative function of stomach changes?

How can the detected pathologies influence the digestion in bowels?

Task 2.

The rat who was not fed during 24 hours was immobilized and placed to the coolroom with temperature 4°C. Results of stomach juice analyze after 24 hours: general acidity- 90 mmol/l, free HCl- 60 mmol/l. On autopsies was detected that tunica mucosa of stomach is hyperemic, few erosion.

Explain the mechanism of detected changes

What irritation and protective factors in pathogenesis of ulcerous disease do you know?

Task 3.

A patient complains of meteorism and weight loss. By microscopic examination of faeces was detected many drops of neutral fat and muscle fibers, few ferments in duodenal contents, in urine high level of diastase.

What type of digestion disorder is it?

What is mechanism of its and what pharmacocorrection needs this pathology?

TASK 10. *Solve the tests for self-control.*

1. A patient complains of pains and heartburn. In the bacterial inoculation was detected *Helicobacter pylori*. What is the most probable diagnose?
A. ulcerous disease of stomach
B. chronic gastritis
C. disorder of meal evacuation
D. disorder of pepsin production
E. disorder of free HCl production
2. A patient was delivered to the clinic with ulcerous disease of stomach. In anamnesis he often changed places of living and working, stayed in permanent taut nerves. What is the main factor in development of disease?
A. alcohol
B. irregular feeding
C. infection
D. stress
E. supercooling
3. A 32 year patient has diagnosed: ulcerous defect of tunica mucosa of stomach (Zollinger-Ellison syndrome).

- What is the main pathogenetic mechanism of ulcer development?
A. increase of hydrochloric acid production
B. increase of gastrin production
C. decrease of protective properties of tunica mucosa
D. reflux of duodenal contents
E. increase of insulin production
4. A patient complains of sour eructation, pains 2 hours later after eat. The stomach juice analyze detected increase of free HCl. What factor is the main in ulcerous disease development?
A. gastrin
B. insulin
C. pepsin
D. cholecystokinin
E. histamine
 5. After the operation has developed the bowel obstruction. What is the main factor in development of this process?
A. pain syndrome
B. spasm of intestinal muscle tissue

- C. obturation of bowl
D. compression of bowl
E. activation of adrenergic fibers
6. A 45 –years- old patient has the following diagnosis ulcerous disease of stomach. On secretion function examination was detected that the basal secretion is three times as much. What factors are main in hypersecretion development?
A. gastrin, histamine
B. glucagon, somatostatin
C. vasoactive intestinal polypeptide
D. pancreatic polypeptide, substance P
E. endorphine
 7. A 63- year- old man complains of sense of heaviness in epigastrium after eating, eructation with musty smell, loose bowels, loss of body mass. What disease has a patient?
A. hyperacid gastritis
B. atrophic gastritis with secretor insufficiency
C. hypoacid gastritis
D. ulcerous disease of duodenum
E. ulcerous disease of stomach

8. A 45-year-old man complains of weakness, work decrement, dull pain in epigastrium after eat, diarrhea. In the acidogram: pH of basal secretion is 3,5, stimulated- 3,0, pepsin of basal secretion- 150 mg/l, stimulated-200 mg/l. What is functional condition of stomach?

- A. increase of acidity, decrease of pepsin
- B. increase of acidity and pepsin
- C. decrease of acidity, decrease of pepsin
- D. decrease of acidity and. increase of pepsin
- E. norm

9. Deficit of what ferment is the cause an incomplete digestion of fats in the gastrointestinal tract and increase of neutral fats in faeces?

- A. gastric lipase
- B. enterokinase
- C. intestinal lipase
- D. pancreatic lipase
- E. hepatic lipase

10. A patient complains of pains in epigastrium, by laboratory examination was detected an increase

of diastase in urine and presence of neutral fats in faeces.

For what pathology of gastrointestinal tract are such symptoms most character?

- A. ulcerous disease of stomach
- B. inflammation of colon
- C. acute apendicitis
- D. infectious hepatitis
- E. acute pancreatitis

11. A 20-year-old patient stays in the clinic with chronic hyperacid gastritis. What type of gastritis attests about chronic process development in this case?

- A. hypertrophic type
- B. rigid antral type
- C. polypous gastritis
- D. sclerosing type
- E. hypoacide type

12. A 36-year-old patient firstly stays in clinic with ulcerous disease of stomach. Whereon must be the pathogenetic therapy directed?

- A. normalization of stomach motion
- B. decrease of acidity of stomach juice

C. removal of neurohumoral regulation of the gastrointestinal tract

D. gastro- and duodenoprotection of tunica mucosa

E. reparation of tunica mucosa of stomach

13. Emergency team delivered a patient with signs of the gastrointestinal tract bleeding. What is cause of bleeding?

- A. ulcerous disease of stomach
- B. cancer of stomach
- C. hypertrophic gastritis
- D. erosive gastritis
- E. Mallory- Weiss disease

14. A 55-year-old patient complains of belting in the top half of abdomen, dyspepsia, loss of body weight, aversion to food, detected cancer of pancreas. Mark organs of often metastases direction:

- A. bones
- B. lungs
- C. stomach
- D. liver
- E. all enumerated is true

15. A 50- year- old patient suffers from ulcerous disease of duodenum.

What is the main factor in development of disease?

- A. increase of sympathetic nerves tonus
- B. infection
- C. increase of parasympathetic nerves tonus
- D. increase of mucus production
- E. increase of insulin production

16. A patient was delivered to clinic with internal hemorrhage. Results of investigation showed disorders of motor function of gastrointestinal tract. Which disorders can promote the ulcerous disease development?

- A. gastro- esophageous reflux
- B. increase of gastric motor activity
- C. duodenogastric reflux
- D. increase of motor function of duodenum
- E. nothing from enumerated

17. A 58- year- old patient was delivered with complains of acute pain in epigastrium and attack of vomiting. Diagnose is acute pancreatitis. What is

the main pathogenetic mechanism of disease development?

- A. disorder of pancreatic secret outflow with activation of proteolytic ferments in ducts of gland
- B. disorder of bile outflow
- C. disorder of blood circulation in pancreas
- D. activation of kallikrein- kinin system
- E. increase of pancreatic juice secretion

18. A 52 -year -old woman complains of acute pain in the top half of abdomen, vomiting. During many years she suffers from cholecystitis. What from enumerated mediators is the main in pancreatitis development?

- A. serotonin
- B. histamine
- C. bradykinin
- D. prostaglandins
- E. leukotrienes

19. A 30 –year- old man came to clinic with diarrhea, meteorism. All symptoms appear after milk drinking.

Deficit of what substance provokes such disorders?

- A. lipase
- B. hydrochloric acid
- C. tripsin
- D. bile
- E. lactase

20. A 52 year old patient was delivered to clinic with symptoms of acute pancreatitis and pancreatic shock. What is the main mechanism of pancreatic shock?

- A. disorder of pancreatic secret outflow
- B. stimulation of pancreatic secretion
- C. activation of proteolytic ferments and entering of them to blood.
- D. autolysis of pancreas tissue
- E. decrease of arterial pressure

21. A 40- year -old patient complains of heartburn, permanent eructation, pains in epigastrium, often obstipations. What type of secretion disorders of stomach covers such symptoms?

- A. hypersecretory variant (hypersecretion, high acidity,

hyperchlorhydria, increase of proteolytic activity of gastric juice)

- B. hyposecretory variant (hyposecretion, reduced acidity)
- C. achylia (absence of free HCl)
- D. dissociation of secretion process
- E. decrease of proteolytic activity of stomach juice

22. A 42 year old patient complains of dry mouth, pains in epigastrium, diarrhea. What type of stomach secretion disorders has a patient/

- A. achylia (absence of free HCl)
- B. hypersecretory variant (hypersecretion, high acidity, hyperchlorhydria, increase of proteolytic activity of gastric juice)
- C. hyposecretory variant (hyposecretion, reduced acidity)
- D. dissociation of secretion process
- E. decrease of proteolytic activity of stomach juice

23. A 35 year old patient was delivered to clinic with acute pains in epigastrium. During last years appeared nausea, vomiting, hunger

pain nights. Patient is very emotional, irritable, smokes and abuses alcohol.

Diagnose: ulcerous disease of stomach. Mark main pathogenetic mechanisms in this disease development?

- A. spasm of vessels, disorder of microcirculation in stomach tunica mucosa under the influence of often psychoemotional reactions
- B. inhibition of prostaglandins synthesis under the alcohol influence
- C. inhibition of mucus synthesis under the alcohol influence
- D. all enumerated is important in disease development
- E. nothing from enumerated

24. A 50 year old patient was delivered to clinic with suspicion on impassability of top part of bowel. Which change in organism is more likely for this type of impassability?

- A. pain
- B. dehydration
- C. intestinal intoxication
- D. peritonitis
- E. hypoxia

25. Doctor recommended to a patient with hypersecretion excluding from diet beef teas, vegetable broth because they stimulate gastric secretion.

What is the main mechanism of gastric secretion in this case?

- A. irritation of mechanoreceptors of stomach
- B. irritation of mechanoreceptors of oral cavity
- C. irritation of gustatory receptors
- D. stimulation of gastrin synthesis with G- cells
- E. stimulation of secretin synthesis in duodenum

26. A 57- years- old patient with suspicion on Zollinger-Ellison syndrome (high level of gastrin in blood serum) came to gastroenterologic department. What disorder of stomach secretion is most probable?

- A. hypoacid hypersecretion
- B. hyperacid hypersecretion
- C. hypoacid hyposecretion
- D. hyperacid hypersecretion
- E. achylia

27. It has been made operation of duodenum resection, which led to decrease of gastro-intestinal hormones secretion:

- A. neurotensin
- B. gastrin and histamine
- C. gastrin
- D. histamine
- E. cholecystokinin and secretin

For notes
