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Факультет VI по підготовці іноземних студентів

ЗАТВЕРДЖЕНО
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Зав. кафедри _____д.мед.н., професор Л.В. Журавльова

МЕТОДИЧНІ ВКАЗІВКИ
для студентів

з дисципліни «Внутрішня медицина (в тому числі з ендокринологією)
студенти 4 курсу I, II, III медичних факультетів, V та VI факультетів по підготовці іноземних студентів

Гастроезофагеальна рефлюксна хвороба

Харків 2016

KHARKOV NATIONAL MEDICAL UNIVERSITY
DEPARTMENT OF INTERNAL MEDICINE N3

METHODOLOGICAL RECOMMENDATIONS FOR STUDENTS

“Gastroesophageal reflux disease”

Kharkiv 2016

Practical class "Gastroesophageal reflux disease", 5 hours

Gastroesophageal reflux disease (GERD) is a chronic digestive disease. GERD occurs when stomach acid or, occasionally, stomach content, flows back into your food pipe (esophagus). The backwash (reflux) irritates the lining of your esophagus and causes GERD. Both acid reflux and heartburn are common digestive conditions that many people experience from time to time. When these signs and symptoms occur at least twice each week or interfere with your daily life, or when your doctor can see damage to your esophagus, you may be diagnosed with GERD. Most people can manage the discomfort of GERD with lifestyle changes and over-the-counter medications. But some people with GERD may need stronger medications, or even surgery, to reduce symptoms.

Prevalence of GERD among adult population is up to 40 %. Wide epidemiological researches in the countries of Western Europe and the USA testify that 40 % of persons constantly (with different frequency) are suffering from the heartburn and have other symptoms of GERD. In Europe prevalence of GERD among adult population is 40-60 %, and in 45-80 % of persons with GERD esophagitis is found. The frequency of the occurrence of complicated esophagitis within the common population is 5 cases out of 100000 a year. The prevalence of a Barrett esophagus among persons with esophagitis approaches 8% with fluctuations from 5 up to 30%.

The educational purposes:
-to teach students to distinguish the basic symptoms and syndromes of GERD;
-to acquaint students with the methods of physical examination of GERD;
-to acquaint students with the methods of research which are applied to the diagnosis of GERD; with indications and contra-indications they have; with the techniques of their performance; with the diagnostic value of each of them;
-to teach students to interpret the results of the lead researches;
-to teach students to distinguish and diagnose the complications of GERD;
-to teach students to administer therapy for GERD.

What should the student know?
-the frequency of GERD occurrence;
-the etiological factors of GERD;
-the pathogenesis of GERD;
-the clinical syndromes of GERD;
-the general and disturbing symptoms of GERD;
-the physical symptoms of GERD;
-the methods of physical examination of patients with GERD;
-the diagnosis of GERD;
-the diagnostic opportunities of esophagogastroduodenoscopy in GERD, the indications and contraindications;
-the technique of carrying out intragastric and intraesophageal pH-metry (including 24-hour pH-metry), clinical evaluation of the results;
-complications in GERD, including Barrett esophagus, malignant adenoma of gullet;
-surveillance of patients with Barrett esophagus;
-treatment of GERD (lifestyle, diet, medication, surgical treatment).

What should the student be able to do?
-to define clinical and physical syndromes in GERD;
-to interpret the results of biochemical and enzyme researches;

-to interpret the data of esophagogastroduodenoscopy;
-to interpret the data of intragastric and intraesophageal pH-metry;
-to interpret the data of x-ray examination of GERD;
-to administer therapy for patients with GERD.

The list of the practical skills that students should acquire:
- examination of the belly;
-superficial palpation of the belly;
-deep sliding palpation of the organs of the belly cavity according to Obrazthov-Stragesko;
-symptoms of irritated peritoneum;
-review of skin and mucous membranes;

Topics content

Gastroesophageal reflux disease (GERD) occurs when the amount of gastric juice that refluxes into the esophagus exceeds the normal limit, causing symptoms with or without associated esophageal mucosal injury (esophagitis).

Epidemiology

Western dietary habits have made GERD a common disease. Approximately 7-10% of adult population experience symptoms of GERD on a daily basis. Because many individuals control symptoms with over-the-counter medications and without consulting a medical professional, the actual number of individuals with GERD is probably higher.
No sexual predilection exists: GERD is as common in men as in women. However, the male-to-female incidence ratio for esophagitis is 2:1-3:1. The male-to-female incidence ratio for Barrett esophagus is 10:1. White males are at a greater risk for Barrett esophagus and adenocarcinoma than other populations.
GERD occurs in all age groups. The prevalence of GERD increases in people older than 40 years.

Etiology

Excessive retrograde movement of acid-containing gastric secretions or bile and acid-containing secretions from the duodenum and stomach into the esophagus is the etiologic effector of GERD. From a therapeutic point of view, informing patients that gastric refluxate is made up not only of acid but also of duodenal contents (eg, bile, pancreatic secretions) is important.
A functional (frequent transient LES relaxation) or mechanical (hypotensive LES) problem of the LES is the most common cause of GERD. Transient relaxation of the LES can be caused by foods (coffee, alcohol, chocolate, fatty meals), medications (beta-agonists, nitrates, calcium channel blockers, anticholinergics), hormones (eg, progesterone), and nicotine.

Pathophysiology

Schematically, the esophagus, lower esophageal sphincter (LES), and stomach can be envisioned as a simple plumbing circuit. The esophagus functions as an antegrade pump, the LES as a valve, and the stomach as a reservoir. The abnormalities that contribute to GERD can stem from any component of the system. Poor esophageal motility decreases clearance of acidic material. A dysfunctional LES allows reflux of large amounts of gastric juice. Delayed

gastric emptying can increase the volume and pressure in the reservoir until the valve mechanism is defeated, leading to GERD. From a medical or surgical standpoint, it is extremely important to identify which of these components is defective so that effective therapy can be applied.

Esophageal defense mechanisms

Esophageal defense mechanisms can be broken down into 2 categories (ie, esophageal clearance and mucosal resistance). Proper esophageal clearance is an extremely important factor in preventing mucosal injury. Esophageal clearance must be able to neutralize the acid refluxed through the lower esophageal sphincter. Mechanical clearance is achieved by esophageal peristalsis; chemical clearance is achieved with saliva. Normal clearance limits the amount of time the esophagus is exposed to refluxed acid or bile and gastric acid mixtures. Abnormal peristalsis can cause inefficient and delayed acid clearance.

Dysfunction of the lower esophageal sphincter

The LES is defined by manometry as a zone of elevated intraluminal pressure at the esophagogastric junction. For proper LES function, this junction must be located in the abdomen so that the diaphragmatic crura can assist the action of the LES, thus functioning as an extrinsic sphincter. In addition, the LES must have a normal length and pressure and a normal number of episodes of transient relaxation (relaxation in the absence of swallowing).
LES dysfunction occurs via one of several mechanisms: transient relaxation of the LES (most common mechanism), permanent LES relaxation, and transient increase of intra-abdominal pressure that overcomes the LES pressure.

Delayed gastric emptying

The postulated mechanism by which delayed gastric emptying may cause GERD is an increase in gastric contents resulting in increased intragastric pressure and, ultimately, increased pressure against the lower esophageal sphincter. This pressure eventually defeats the LES and leads to reflux.

Hiatal hernia

Hiatal hernia may contribute to reflux via a variety of mechanisms. The LES may migrate proximally into the chest and lose its abdominal high-pressure zone (HPZ), or the length of the HPZ may decrease. The diaphragmatic hiatus may be widened by a large hernia, which impairs the ability of the crura to function as an external sphincter. Finally, gastric contents may be trapped in the hernial sac and reflux proximally into the esophagus during relaxation of the LES.

Obesity as contributing factor

Increased intragastric pressure and gastroesophageal pressure gradient, incompetence of the LES, and increased frequency of transient LES relaxations may all play a role in the pathophysiology of GERD in patients who are morbidly obese.

Clinical presentation

History

GERD is associated with a set of typical (esophageal) symptoms, including heartburn, regurgitation, and dysphagia. (However, a diagnosis of GERD based on the presence of typical symptoms is correct in only 70% of patients.) In addition to these typical symptoms,

abnormal reflux can cause atypical (extraesophageal) symptoms, such as coughing, chest pain, and wheezing.
A history of nausea, vomiting, or regurgitation should alert the physician to evaluate for delayed gastric emptying.
Patients with GERD may also experience significant complications associated with the disease, such as esophagitis, stricture, and Barrett esophagus. Approximately 50% of patients with gastric reflux develop esophagitis.

Physical Examination

Typical esophageal symptoms

Heartburn is the most common typical symptom of GERD. It is felt as a retrosternal sensation of burning or discomfort that usually occurs after eating or when lying supine or bending over.
Regurgitation is an effortless return of gastric and/or esophageal contents into the pharynx. Regurgitation can induce respiratory complications if gastric contents spill into the tracheobronchial tree.
Dysphagia occurs in approximately one third of patients. Patients with dysphagia experience a sensation that food is stuck, particularly in the retrosternal area. Dysphagia can be an advanced symptom and can be due to a primary underlying esophageal motility disorder, a motility disorder secondary to esophagitis, or stricture formation.

Atypical extraesophageal symptoms

Coughing and/or wheezing are respiratory symptoms resulting from the aspiration of gastric contents into the tracheobronchial tree or from the vagal reflex arc producing bronchoconstriction. Approximately 50% of patients who have GERD-induced asthma do not experience heartburn.
Hoarseness results from irritation of the vocal cords by gastric refluxate and is often experienced by patients in the morning.
Reflux is the most common cause of noncardiac chest pain, accounting for approximately 50% of cases. Patients can present to the emergency department with pain resembling a myocardial infarction. Reflux should be ruled out (using esophageal manometry and 24-hour pH testing if necessary) once a cardiac cause for the chest pain has been excluded. Alternatively, a therapeutic trial of a high-dose proton pump inhibitor (PPI) can be tried.
Additional atypical symptoms from abnormal reflux include damage to the lungs (eg, pneumonia, asthma, idiopathic pulmonary fibrosis), vocal cords (eg, laryngitis, cancer), ear (eg, otitis media), and teeth (eg, enamel decay).

Diagnostic Considerations

Gastroesophageal reflux may be classified into 3 categories, as follows:

- Physiologic (or functional) gastroesophageal reflux: these patients have no underlying predisposing factors or conditions; growth and development are normal; and pharmacologic treatment is typically not necessary, though it may be needed to relieve symptoms if lifestyle changes are unsuccessful.
- Pathologic gastroesophageal reflux or GERD: patients frequently experience complications noted above, requiring careful evaluation and treatment.
- Secondary gastroesophageal reflux: this refers to a case in which an underlying condition may predispose to gastroesophageal reflux, with examples including asthma (a condition that may also be, in part, caused by or exacerbated by reflux) and gastric outlet obstruction.

The diagnosis of GERD in patients with atypical symptoms can be difficult. When patients present with atypical complaints, the diagnosis of GERD must be kept in mind. Patients with

recurrent aspiration can have asthma, history of pneumonias, and progressive pulmonary fibrosis. Additionally, hoarseness can be present due to chronic laryngeal irritation. Chest pain is another presenting symptom that can be difficult to evaluate. In these patients, excluding cardiac etiology is important prior to labeling the pain as noncardiac chest pain secondary to GERD.

The clinical presentation of GERD in pregnant women is similar to that for the general population. Heartburn and regurgitation are the cardinal symptoms. The diagnostic evaluation consists of a thorough history and physical examination.

Diagnosis

Upper Gastrointestinal Endoscopy

Esophagogastroduodenoscopy (EGD) demonstrates the anatomy and identifies the possible presence and severity of complications of reflux disease (esophagitis, Barrett esophagus, strictures). Using the patient's history and pathologic analysis of biopsy specimens obtained during endoscopy, the diagnosis of GERD can be made. EGD also excludes the presence of other diseases (eg, peptic ulcer) that can present similarly to GERD.

Although EGD is frequently performed to help diagnose GERD, it is not the most cost-effective diagnostic study, because esophagitis is present in only 50% of patients with GERD.

Esophageal Manometry

Esophageal manometry defines the function of the LES and the esophageal body (peristalsis). Esophageal manometry is essential for correctly positioning the probe for the 24-hour pH monitoring.

Indications for esophageal manometry and prolonged pH monitoring include the following:

- Persistence of symptoms while taking adequate antisecretory therapy, such as PPI therapy
- Recurrence of symptoms after discontinuation of acid-reducing medications
- Investigation of atypical symptoms, such as chest pain or asthma, in patients without esophagitis
- Confirmation of the diagnosis in preparation for antireflux surgery

Ambulatory 24-Hour pH Monitoring

Ambulatory 24-hour pH monitoring is the criterion standard in establishing a diagnosis of GERD, with a sensitivity of 96% and a specificity of 95%. It quantifies the gastroesophageal reflux and allows a correlation between the symptoms of reflux and the episodes of reflux. Patients with endoscopically confirmed esophagitis do not need pH monitoring to establish a diagnosis of GERD. Esophageal acid exposure is defined by the percentage of the 24-h recording time that the pH is < 4.0. Values > 3.5% are considered abnormal. However, symptoms may not correlate with acid exposure or the presence of esophagitis. This may be because symptoms may result from nonacidic as well as acidic refluxate.

Imaging

Plain radiographic findings are not useful in evaluating patients for GERD, but they are helpful in evaluating the pulmonary status and basic anatomy. Chest images may demonstrate a large hiatal hernia, but small hernias can be easily missed. Upper GI contrast-enhanced studies are the initial radiologic procedure of choice in the workup of the patient in whom GERD is suggested. Esophageal inflammatory and neoplastic diseases are better detected with double-contrast techniques. Conversely, single-contrast techniques are more sensitive for structural defects such as hiatal hernias and strictures or esophageal rings.

Currently, no role exists for CT, MRI, or ultrasonography in the routine evaluation of patients with reflux disease.

Differential Diagnoses

- Achalasia
- Acute Gastritis
- Chronic Gastritis
- Coronary Artery Atherosclerosis
- Esophageal Cancer
- Esophageal Motility Disorders
- Esophageal Spasm
- Esophagitis
- Gallstones (Cholelithiasis)
- Helicobacter Pylori Infection
- Hiatal Hernia
- Intestinal Malrotation
- Intestinal Motility Disorders
- Irritable Bowel Syndrome
- Peptic Ulcer Disease

Complications

Esophagitis

Esophagitis (esophageal mucosal damage) is the most common complication of GERD, occurring in approximately 50% of patients.

Esophagitis may be diagnosed using endoscopy, although it cannot always be appreciated on endoscopy. As many as 50% of symptomatic patients with GERD demonstrate no evidence of esophagitis on endoscopy. Still, documentation of this complication is important in diagnosing GERD. Degrees of esophagitis are described by the Savary-Miller classification as follows.

- Grade I – Erythema
- Grade II – Linear nonconfluent erosions
- Grade III – Circular confluent erosions
- Grade IV – Stricture or Barrett esophagus.

Stricture

Strictures are advanced forms of esophagitis and are caused by circumferential fibrosis due to chronic deep injury. Strictures can result in dysphagia and a short esophagus. Gastroesophageal reflux strictures typically occur in the mid-to-distal esophagus and can be visualized on upper GI tract studies and endoscopy. Presence of a stricture with a history of reflux can also help diagnose GERD. Patients present with dysphagia to solid meals and vomiting of nondigested foods.

As a rule, the presence of any esophageal stricture is an indication that the patient needs surgical consultation and treatment.

Barrett esophagus

The most serious complication of long-standing or severe GERD is the development of Barrett esophagus. Barrett esophagus is present in 8-15% of patients with GERD. Barrett esophagus is thought to be caused by the chronic reflux of gastric juice into the esophagus. It is defined by metaplastic conversion of the normal distal squamous esophageal epithelium to columnar epithelium. Histologic examination of esophageal biopsy specimens is required to make the diagnosis. Varying degrees of dysplasia may be found on histologic examination.

Barrett esophagus with intestinal type metaplasia has malignant potential and is a risk factor

for the development of esophageal adenocarcinoma, increasing the risk of adenocarcinoma 30-40 times. The incidence of adenocarcinoma of the esophagus is increasing steadily in Western society. Currently, adenocarcinoma accounts for more than 50% of esophageal cancers in Western industrialized nations. As with esophageal stricture, the presence of Barrett esophagus indicates the need for surgical consultation and treatment.

Treatment

Treatment of gastroesophageal reflux disease (GERD) involves a stepwise approach. The goals are to control symptoms, to heal esophagitis, and to prevent recurrent esophagitis or other complications. The treatment is based on (1) lifestyle modification and (2) control of gastric acid secretion through medical therapy with antacids or PPIs or surgical treatment with corrective antireflux surgery.

Approximately 80% of patients have a recurrent but nonprogressive form of GERD that is controlled with medications. Identifying the 20% of patients who have a progressive form of the disease is important, because they may develop severe complications, such as strictures or Barrett esophagus. For patients who develop complications, surgical treatment should be considered at an earlier stage to avoid the sequelae of the disease that can have serious consequences.

Lifestyle Modifications

Lifestyle modifications include the following:

- Losing weight (if overweight)
- Avoiding alcohol, chocolate, citrus juice, and tomato-based products, peppermint, coffee)
- Avoiding large meals
- Waiting 3 hours after a meal before lying down
- Elevating the head of the bed by 8 inches

Lifestyle modifications are the first line of management in pregnant women with GERD. Advise patients to elevate the head of the bed; avoid bending or stooping positions; eat small, frequent meals; and refrain from ingesting food (except liquids) within 3 hours of bedtime.

Pharmacologic Therapy

Antacids

Antacids were the standard treatment in the 1970s and are still effective in controlling mild symptoms of GERD. Antacids should be taken after each meal and at bedtime.

H2 receptor antagonists and H2 blocker therapy

H2 receptor antagonists are the first-line agents for patients with mild to moderate symptoms and grades I-II esophagitis. Options include ranitidine, cimetidine, famotidine, and nizatidine.

The H2 receptor antagonists are reversible competitive blockers of histamine at the H2 receptors, particularly those in the gastric parietal cells, where they inhibit acid secretion. They are highly selective, do not affect the H1 receptors, and are not anticholinergic agents.

H2 receptor antagonists are effective for healing only mild esophagitis in 70-80% of patients with GERD and for providing maintenance therapy to prevent relapse. Tachyphylaxis has been observed, suggesting that pharmacologic tolerance can reduce the long-term efficacy of these drugs.

Additional H2 blocker therapy has been reported to be useful in patients with severe disease (particularly those with Barrett esophagus) who have nocturnal acid breakthrough.

Proton pump inhibitors

PPIs are the most powerful medications available for treating GERD. Proton pump inhibitors

(PPIs) inhibit gastric acid secretion by inhibition of the H^+/K^+ ATPase enzyme system in the gastric parietal cells. These agents should be used only when this condition has been objectively documented. They have few adverse effects and are well tolerated for long-term use. However, data have shown that PPIs can interfere with calcium homeostasis and aggravate cardiac conduction defects. These agents have also been responsible for hip fracture in postmenopausal women.

Available PPIs include omeprazole, lansoprazole, rabeprazole, pantoprazole and esomeprazole.

Prokinetic medications and reflux inhibitors

Prokinetic agents, such as metoclopramide, improve the motility of the esophagus and stomach and increase the LES pressure to help reduce reflux of gastric contents. They also accelerate gastric emptying. Prokinetic agents are somewhat effective but only in patients with mild symptoms; other patients usually require additional acid-suppressing medications, such as PPIs. The usual regimen in adults is metoclopramide, 10 mg/day orally. Long-term use of prokinetic agents may have serious, even potentially fatal, complications and should be discouraged.

Surgical treatment

Transthoracic and transabdominal fundoplications are performed for gastroesophageal reflux disease, including partial (anterior or posterior) and circumferential wraps. Open and laparoscopic techniques may be used.

Placement of a device to augment the lower esophageal sphincter is another surgical option.

Indications for fundoplication include the following:

- Patients with symptoms that are not completely controlled by proton pump inhibitors
- Patients with well-controlled reflux disease who desire definitive, one-time treatment
- The presence of Barrett esophagus
- The presence of extraesophageal manifestations
- Young patients
- Poor patient compliance with medications
- Postmenopausal women with osteoporosis
- Patients with cardiac conduction defects
- Cost of medical therapy

The control of the initial level of knowledge

1. The patient complains of the heartburn, an eructation which amplifies with the bending of the trunk, pain behind the breast when swallowing. What caused the given clinical picture?

A. Chronic gastritis
B. GERD
C. Ulcer of the stomach
D. Ulcer of the duodenum
E. Chronic cholecystitis

2. The 52 year old man who suffers from GERD complains of weakness, palpitation. Objectively: pallor of skin and mucous membranes, angularis stomatitis. Puls-112 per minute, progresses, the joint-stock company—90/60 mm Hg. Tones of heart are muffled, systolic murmur on the top of the heart. The liver and spleen are not palpated. What caused the given changes?

A. Erytrocytolysis
B. Chronic gastritis

C. Anemia, which is caused by GERD
D. Anemia which is caused by a stomach ulcer
E. Anemia which is caused by a heart disease

3. The 35 year old woman complains of the heartburn and a pain when swallowing. Which of the researches is the most informative?
A. Colonoscopy
B. pH-metry
C. Ultrasound research
D. Roentgenoscopy of the stomach
E. Esophagogastroduodenoscopy

4. The 24 year old patient complains of a pain in the thorax during sleeping which is occasionally accompanied by heartburn. The belly is soft and painless. The liver and the spleen are not increased. Which of the researches is the most informative?
A. ECG
B. pH-metry
C. Ezofagogastroduodenoscopy
D. Roentgenoscopy of the stomach
E. Ultrasound research

5. The 29 years old patient complains of heartburn, air eructation, and recurrent pains when swallowing. Which diagnosis is the most probable?
A. Acute gastritis
B. Chronic gastritis type A
C. Chronic gastritis type B
D. GERD
E. Ulcerative disease of the stomach

6. The 20 years old employee had pains in epigastrium, which were accompanied with the heartburn. Reception peep removes the pain. He often takes soda that helps for a short period of time. Which of the listed methods is the most informative to make the diagnosis?
A. Factional research of gastric contents
B. Roentgenoscopy of the gastroenteric tract
C. Fibroesophagogastroduodenoscopy
D. pH-metry of the stomach
E. Duodenal sounding

7. The 35 years old patient complains of a pain in the epigastrium after food intake, heartburn and eructation. During fibrogastroduodenoscopy relive erosion of the lower third of the gullet is visualized. What is the most possible diagnosis?
A. GERD
B. Chronic gastritis
C. Ulcer of the stomach
D. Chronic gastroduodenitis
E. IHD

8. The 42 years old patient complains of the difficulty in swallowing solid food and the pain in the lower part of the breast, hiccups. What is the diagnosis?
A. Cancer of the gullet

B. Esophageal diverticulum
C. GERD
D. Chronic esophagitis
E. Cancer of the stomach
F.

9. The 49 years old patient with the overweight complains of the pain in epigastrium and heartburn at night. What research is the most informative?

A. ECG
B. Factional research of the gastric juice
C. USR
D. Roentgenoscopy of the stomach
E. Esophagogastroduodenoscopy

10. The patient complains of an intensive pain under the xiphoid process which amplifies at night, the pain does not pass and increases after the food intake. Which disease can be suspected first of all?

A. Ulcer of the duodenum
B. Ulcer of the stomach
C. Chronic gastritis type A
D. GERD
E. Chronic gastritis type B

Correct answers:

1. B
2. C
3. E
4. C
5. D
6. D
7. A
8. C
9. E
10. D

The control of the final level of knowledge

1. Anemia is revealed in the patient who complains of the heartburn, food eructation, and recurrent pain under the xiphoid process when swallowing. What is most probable reason of the anemia?

A. GERD
B. Chronic gastritis type A
C. Chronic gastritis type B
D. Cancer of the stomach
E. All listed above

2. What is the development the anemic syndrome with GERD connected with?

A. Disorder of the iron absorption
B. Fall of the maintenance of the hydrochloric acid
C. Fall of factor Kastl
D. Presence of antibodies to the stomach cells

E. Development of the erosion of the gullet

3. What clinical characteristics does the painful syndrome have with GERD?
   A. Passes after vomiting
   B. Increases during sleeping
   C. Increases during defecation
   D. Is accompanied with a bitter taste in the mouth
   E. Increases after vomiting

4. What pathogenic mechanisms of the development of GERD prevail in pregnant women?
   A. Duodenostasis
   B. Increase of the intrabelly pressure
   C. Gastrostasis
   D. Increase in the acidity of the gastric contents
   E. Decrease in the acidity of the gastric contents

5. Name the basic clinical forms of GERD
   A. Non- erosive and erosive GERD
   B. Esophageal and non- esophageal GERD
   C. Esophageal strictures
   D. Barrett esophagus
   E. All listed above

6. Clinically apparent feature of the pain in gastroesophageal reflux disease is:
   A. Intensification after food intake
   B. Intensification during food intake
   C. Long and burning pain
   D. Irradiation of the pain along the gullet
   E. Pain in empty the stomach

7. Barrett gullet is:
   A. Complication of the stomach ulcer
   B. Complication of the duodenum ulcer
   C. Complication of GERD
   D. Complication of chronic gastritis
   E. Complication of cirrhosis of the liver

8. What is characteristic for Barrett gullet?
   A. Ulcer of the gullet
   B. Ulcer of the stomach
   C. Anemia
   D. Small intestine epithelia metaplasia in the mucous of the gullet
   E. Epithelia metaplasia in the cardiac portion of the stomach

9. Does PPI test help to…?
   A. Diagnose GERD
   B. Diagnose the stomach ulcer
   C. Define the level of the secretion of the stomach
   D. Diagnose Pylori
   E. Diagnose a cirrhosis of the liver

10. What is the most effective combination of preparations in the treatment of GERD?
    A. Inhibitors of proton pomp + prokinetics
    B. H2-blockers of histamine receptors + antacids
    C. Spasmolytics + prokinetics
    D. M-holinolytics + H2-blocker of histamine receptors
    E. Spasmolytics+analgetics

Correct answers:

1. A
2. E
3. B
4. B
5. A
6. A
7. C
8. D
9. A
10. A

Case-based questions on GERD and its complications

A 45 year-old nurse presents to your office complaining of a 5-month history of burning retrosternal pain that radiates into the throat. This is occasionally associated with regurgitation of bitter fluid into her mouth. Initially the symptoms were quite infrequent but she now experiences them on most days. Chewable antacid tablets used to relieve the burning promptly, but she now gets incomplete and only transient relief.

Her symptoms usually occur in the evening within one-hour following supper. She has also awakened in the middle of the night on two occasions with severe burning retrosternal pain.

She is otherwise well and denies other active medical problems.

On direct questioning the patient denies a history of dysphagia, hematemesis, melena, anemia or respiratory symptoms.

She does admit to gaining about 6 kg in weight in the last year. She also tells you that for the last 10 months she has been taking amitriptyline at bedtime to prevent migraine headaches.

At this point, what is your leading diagnosis?

A. Angina
B. Reflux esophagitis
C. Infectious esophagitis
D. GERD
E. Peptic ulcer disease
F. Functional dyspepsia

1. What tests (if any) would you do to confirm diagnosis?

A. ECG
B. Esophageal manometry
C. Esophageal pH study
D. Upper endoscopy
E. Nothing

The patient wonders whether the Amitriptyline may be contributing to her symptoms because they seemed to have begun shortly after she started on the drug.

2. List all the mechanisms whereby amitriptyline, or other drugs with anticolinergic side effects, might make the patient's condition worse.

A. Decreased LES pressure
B. delayed gastric emptying
C. effect on the angle of HIS
D. impaired esophageal peristalsis
E. impaired salivation
F. increased intragastric pressure
G. mucosal damage
H. pylorospasm
I. no relationship

You advise the patient about the lifestyle measures and suggest that she continue using antacids as needed for her heartburn. The amitriptyline is replaced with another anti-migraine medication. She is significantly better when you see her in follow-up 3 weeks later. Subsequently, she moves to another city because of her job. You don't see her again until 4 years later when she returns back. She consults you again about her heartburn problem because it has worsened significantly. The problem was under good control for about 2 years after she moved, but then recurred even though she did every effort to implement lifestyle measures. Unfortunately, she was unable to lose weight. She is now experiencing retrosternal burning with acid regurgitation at least once or twice a day. Of more concern to her is that she now experiences solid food sticking in the suprasternal notch area several times per week.

3. Of the following, which historical detail would not be helpful in differentiating the location of the dysphagia (oropharyngeal versus esophageal dysphagia):

A. whether dysphagia was for solids alone, liquids alone, or both
B. whether there was associated coughing or choking
C. timing of the dysphagia relative to the onset of the swallow
D. whether there was associated nasal regurgitation during swallowing
E. whether swallowing liquids helps dislodge the food bolus

The patient claims that there is no associated choking or coughing during swallowing and says that the food seems to stick in the suprasternal notch ~2-3 seconds after she completes the swallow. She also says that the dysphagia is unpredictable - some days she can eat whatever she wants, whereas on other days any number of different solids will get stuck.

4. Based on this history, do you think the origin of the dysphagia is most likely due to:

A. obstructive oropharyngeal disease
B. obstructive esophageal disease
C. functional (neuromuscular) oropharyngeal disease
D. functional (neuromuscular) esophageal disease

5. How would you manage the patient's problem at this point?

A. 24-hour esophageal monitoring
B. Bernstein (acid-perfusion) test
C. esophageal manometry
D. refer for anti-reflux surgery
E. refer for upper endoscopy
F. start therapy with prokinetic agent

G. start therapy with an H2 receptor antagonist
H. start therapy with proton pump inhibitor
I. barium x-ray of esophagus

6. You start her on an H2 receptor antagonist (cimetidine) and refer her for endoscopy. This led to an immediate relief of her heartburn. The endoscopist finds evidence of reflux esophagitis with a peptic stricture. He performs an esophageal dilatation, which resolves her dysphagia. She returns to you two weeks later saying that the heartburn is beginning to return even though she is taking an extra cimetidine tablet each day.

What would you do now?
a) add a prokinetic agent (e.g., domperidone) to the cimetidine
b) refer for anti-reflux surgery
c) try another H2 receptor antagonist
d) increase the dose of the cimetidine further
e) replace cimetidine with a proton pump inhibitor

Correct answers for **case-based questions**

Question 1. Correct answer – D (GERD)

Question 2. Correct answer – E (nothing)

This history is typical of GERD and there are no "alarm" symptoms, therefore the diagnosis is secure and no further tests are necessary at this point.

Question 3. Correct answers – A, B, D, E (Decreased LES pressure, delayed gastric emptying, impaired esophageal peristalsis, impaired salivation)

Question 4. Correct answer – A (whether dysphagia was for solids alone, liquids alone, or both)

In this patient dysphagia is referred to suprasternal notch, but this does not mean that is where the food is actually getting stuck. Approximately 15% of patients in whom the bolus gets held up in the esophagus will perceive food sticking in the throat area. Whether dysphagia is for solids alone, liquids alone, or both is quite helpful in differentiating a structural from a functional etiology, but does not help in differentiating whether dysphagia is oropharyngeal or esophageal in origin).

Question 5. Correct answer – D (functional (neuromuscular) esophageal disease)

Despite the dysphagia being perceived in the suprasternal notch, the historical features strongly point to an esophageal cause. The classic teaching is that dysphagia for solids alone is most consistent with a structural problem, whereas dysphagia for solids and liquids from the outset indicates motor disorder. However, many patients with motor disorder will only have trouble with solids. If the dysphagia for solids is predictable (certain hard-consistency foods always get stuck) – then a structural problem is likely. If the dysphagia is unpredictable (some day solids get stuck whereas on other day the patient can eat anything without a problem) – then a motor disorder should be suspected.

Question 6. Correct answer – E, G, H, I (refer for upper endoscopy, start therapy with an H2 receptor antagonist or proton pump inhibitor, barium x-ray of esophagus).

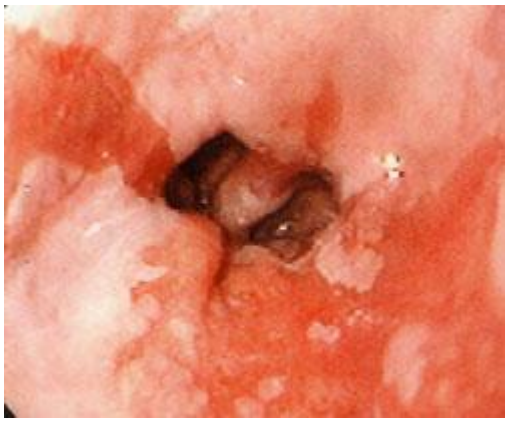
Note: although barium x-rays are not particularly useful in uncomplicated heartburn or dyspepsia, they can provide very helpful information when patient presents with dysphagia.

Question 7. Correct answer – E (replace cimetidine with a proton pump inhibitor)
PPI's are usually effective when H2 blockers have failed.

Case-based questions on diagnostics and treatment of patients with GERD

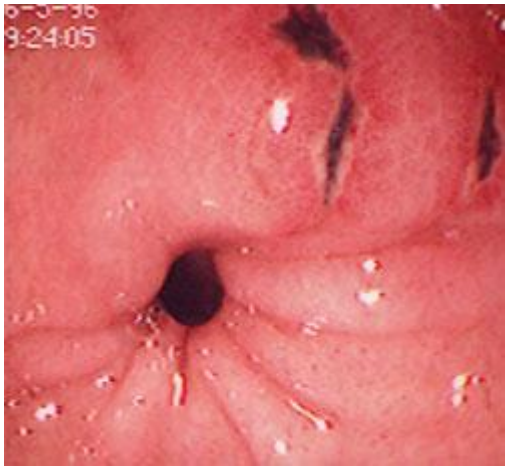
1. A 60-year-old white male presents to your office with a 20 year history of daily heartburn, acid regurgitation and intermittent dysphagia. His endoscopy is shown in the figure. Biopsies confirm the presence of specialized intestinal metaplasia with low grade dysplasia. The best medical regimen for treating his problem would be:

A. PPI in a.m. before breakfast
B. PPI 2/daily before breakfast and dinner
C. PPI BID and H2RA at bedtime
D. PPI dosage determined by serial pH testing



2. A 26-year-old male athlete has severe heartburn. EGD reveals erosive esophagitis, but the patient is also found to have abnormalities in the stomach, which are shown in this figure. In addition to obvious GERD, the patient most likely has:

A. *H. pylori* gastritis
B. Granulomatous colitis
C. Acute NSAID-related gastritis
D. Lymphocytic gastritis



3. A 55-year-old man with long-standing gastroesophageal reflux disease (GERD) is found to have Barrett esophagus on a routine upper GI endoscopy. Four-quadrant biopsies show no dysplasia. He takes proton pump inhibitor (PPI) therapy every day, and he reports that his heartburn is under reasonable control. Physical examination is unremarkable. What would you recommend regarding the treatment of this patient's Barrett esophagus?

A. Start an endoscopic surveillance program to look for dysplastic lesions
B. Increase the PPI dose to maximally suppress acid secretion
C. Refer for antireflux surgery to decrease the chances of progression to
D. esophageal adenocarcinoma
E. Refer for esophagectomy

Correct answers

Question 1. Correct answer – A (PPI in a.m. before breakfast).

The patient has Barrett esophagus without esophagitis but with associated low grade dysplasia. The goal is to control symptoms, as there is no evidence that PPIs or surgery cause Barrett's mucosa to regress or prevent cancer. Since there is no associated esophagitis, a single a.m. dose of a PPI should control his symptoms, although approximately 25% may need a 2/day dose. Although theoretically appealing, there is no strong clinical evidence that Barrett's patients who have their reflux values normalized do better than those who do not.

Question 2. Correct answer – C (Acute NSAID-related gastritis).

The most common cause of acute gastritis is NSAID ingestion. Injury to the gastric mucosa can occur as rapidly as one hour after initial intake. The first finding is usually that of intraepithelial hemorrhage, which can be seen as rapidly as one to two hours after ingestion. Subsequently, erosions develop and are maximal in two to four days. Continued usage of these agents can lead to NSAID-related ulcer disease and its complications. Endoscopic abnormalities (i.e. acute gastritis) can be seen in 70-75% of all patients chronically using NSAID's. There is an ulcer incidence of 20-25% in these patients, and about 10% of these will subsequently develop significant GI bleeding. The sequence of erosive gastritis and its relationship to ulcer disease is unexplained. The phenomenon of cytoadaptation may play a role in determining which patients normalize their mucosa with continued NSAID intake and which go on to varying degrees of continued chronic gastritis and/or ulcer. Cytoadaptation has been demonstrated for aspirin and indomethacin and tends to occur sooner in patients on lower doses of these agents, which may in part explain dose-dependence for NSAID injury to the stomach. The primary mechanism by which NSAID's produce gastric mucosal injury and ultimately gastritis or ulcer is felt to be systemic inhibition of prostaglandin synthesis from

arachidonic acid via the enzyme cyclooxygenase. NSAID gastritis is diagnosed endoscopically. The classic finding is that of numerous superficial erosions throughout the gastric antrum. Many of these have a hemorrhagic base and the intervening mucosa appears slightly granular. Numerous intraepithelial hemorrhages are seen, but these are more prominent in the corpus than in the antrum. Patients with NSAID gastritis who do not have ulcer disease are often asymptomatic, although varying degrees of nausea, dyspepsia, and abdominal pain can occur. This is due to the fact that the disease is confined to the mucosa and/or the analgesic effect of the NSAID's.

Question 3. Correct answer -A (Start an endoscopic surveillance program to look for dysplastic lesions).

Barrett esophagus is a sequela of chronic GERD in which the stratified squamous epithelium that normally lines the distal esophagus is replaced by abnormal columnar epithelium. The diagnosis of Barrett esophagus is established when the endoscopist sees columnar epithelium lining the distal esophagus. Regular endoscopic surveillance for esophageal cancer has been recommended in patients with Barrett esophagus. Esophageal biopsy specimens are taken during surveillance endoscopy primarily to identify dysplasia, a histologic diagnosis suggesting a premalignant lesion. For fit patients with identified high-grade dysplasia, three management options are available: esophagectomy, endoscopic ablative therapy, or intensive surveillance (withholding invasive therapy until the biopsies show adenocarcinoma). This patient has no active dysplasia, so invasive therapy is not indicated; he needs active surveillance. There is no evidence that increasing the doses of PPI helps with the dysplastic changes. Several studies have shown that antireflux surgery does not effect a permanent cure for GERD in the majority of patients (they still need to take PPI after the surgery), and surgery is no better than medication for preventing the peptic and neoplastic complications of GERD.

Test questions

1. Definition of GERD.
2. The basic clinical syndromes of GERD.
3. The characteristics of the pain syndrome in GERD.
4. The characteristic of dyspeptic syndrome in GERD.
5. External esophageal displays of GERD.
6. Name the methods of diagnosis of GERD.
7. Name the complications of GERD.
8. Diagnosis of Barrett esophagus.
9. Principles of treatment of patients with GERD
10. Lifestyle modification and diet therapy for the patients with GERD.
11. Medication therapy of GERD
12. Surgical treatment of GERD
13. Prevention of GERD

Practical tasks

1. Supervise the patients with GERD.
2. Interpret the received results of the laboratory methods of research.
3. Give the interpretation of the received results of instrumental methods of research.
4. Write the recipes concerning the treatment of GERD.

Clinical examination of the patient

Name of the patient_____
_____

Age____profession_____

Complaints_____
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_____
_____

Anamnesis morbi

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Anamnesis vitae

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The results of physical examination of the patient:

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Preliminary diagnosis:

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The results of additional research methods:

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Substantiation of clinical diagnosis:

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Clinical diagnosis:

Main
diagnosis_____
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_____

Concomitant pathology
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_____
_____

Complications
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_____
_____
_____

Treatment:

1. _____

2. Diet _____

3 ._____

4 ._____

5 _____

Materials for self-preperation

1. Davidson's "Principles and Practice of Medicine" 21st edition, Alimentary tract and pancreatic disease, p. 835-919.
2. Current Medical Diagnosis and Treatment, Gastrointestinal disorders, 2014, p. 564-662
3. Harrison's, Principles of Internal Medicine, 19th edition, Gastoenterology and Hepatology, p.257-398

Інформаційні ресурси

сайт кафедри внутрішньої медицини № 3 ХНМУ http://www. vnmed3.kharkiv.ua/, встановлене інформаційно-освітнє середовище Moodle на піддомен сайта http://distance-training. vnmed3.kharkiv.ua

Методична вказівка складена: асистентом А.К. Журавльовою

Методична вказівка переглянута і затверджена на засіданні кафедри: _____

З доповненнями (змінами) _____

Завідувач кафедри Л.В. Журавльова