МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ

"Затверджено"
на методичній нараді
кафедри внутрішньої медицини № 3
Завідувач кафедри
професор_____
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"27" серпня 2010 р.

МЕТОДИЧНІ РЕКОМЕНДАЦІЇ
ДЛЯ СТУДЕНТІВ
з англомовною формою навчання

Навчальна дисципліна	Основи внутрішньої медицини
Модуль №	2
Змістовний модуль № 2	Основи діагностики, лікування та профілактики основних хвороб органів травлення
Тема заняття	Гастроезофагеальна рефлюксна хвороба (ГЕРХ)
Курс	4
Факультет	Медичний

Харків 2010

KHARKOV NATIONAL MEDICAL UNIVERSITY
DEPARTMENT OF INTERNAL MEDICINE N3

METHODOLOGICAL RECOMMENDATIONS FOR STUDENTS

“Gastroesophageal reflux disease”

Kharkiv 2014

Content module №2 «Bases of diagnostics, treatment and preventive maintenance of the basic illnesses organs of digestive tract»

Practical class №11
"Gastroesophageal reflux disease (GERD)"

Urgency

The urgency of the problem of GERD gains big prevalence. The presence of both typical and atypical clinical displays which complicates diagnostics of GERD leads to hyper diagnostics of some diseases, for example IHD and it also complicates the course of the bronchial asthma. This also causes difficult complications, such as stricturing of the gullet, bleeding from ulcers of the gullet, etc.

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) suffering from the heartburn have symptom the GERD. In Russia prevalence the GERD among adult population makes 40-60 %, and in 45-80 % of persons with GERD esophagitis is found. The frequency of the occurrence of the complicated esophagitis within the common population makes 5 cases out of 100000 a year. The prevalence of a gullet of Barret among persons with esophagitis approaches 8 % with fluctuations from 5 up to 30 %. In the last decades a significant growth of the malignant adenoma of gullet (MAG)-shift of a correlation "plane cellular cancer / malignant adenoma" with 9:1 to 8:2 is observed. The frequency of its revealing is estimated as 6-8 new cases out of 100000 a year. The frequency of MAG at patients with Barret's gullet has increased up to 800 cases out of 100000 a year.

Formation strictures of gullet are noted in 7-23 % of patients with erosive-ulcer esophagitis, occurrence of bleedings - in 2 %. Among the persons who are older than 80 years gastroenteric bleedings of erosion and ulcer of the gullet are caused in 21 % of cases, and among the patients who have operations at the department of intensive therapy - to 25 % of cases.

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 diagnostics 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 independently;
-to teach students to distinguish and diagnose the complication with GERD;
-to teach students to institute therapy for GERD.

What should the student know?

-the frequency of GERD occurrence;
-the etiological factors of GERD;
-the pathogenesis of GERD;
-the cores of 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 diagnostics of GERD;
-the diagnostic opportunities of esophagogastroduodenoscopy with GERD, the indications, contra-indications;
-the technique of carrying out intragastric and intraesophageal pH-metry (including 24-hour pH-metry), clinical estimation of the results;
-the rabeprasolum test;
-X-ray examination of GERD;
-complications with GERD, including Barret's gullet, malignant adenoma of gullet;

-conducting patients with Barret's gullet;
-treatment of GERD (change of the way of life, balanced diet, medication, surgical treatment).

What should the student be able to do?
-to define the cores of clinical and physical syndromes with GERD;
-to interpret the results of biochemical and enzyme multiplied 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 interpret the results of the rabeprasolum test;
-to institute the therapy for the patients with GERD.

The list of the practical skills which the student should acquire
-examination of the belly;
-superficial palpation of the belly;
-deep methodical sliding palpation of the organs of the belly cavity according to Obrazthov-Stragesko;
-the symptoms of irritated peritoneum;
-the review of skin and mucous membrane;
The contents of the theme "Gastroesophageal reflux disease (GERD)"
Definition

It is a complex of characteristic symptoms with the presence of inflammatory changes in distalis parts of a gullet owing to discharging gastric and/or duodenal content into the esophagus, gastroesophageal reflux without an accompanying inflammation of a gullet is also a component of GERD.

Gastroesophageal reflux in general may be classified as physiologic or pathologic one.
Physiologic reflux is typically postprandial, short-living, asymptomatic, not during sleep. Pathologic reflux produces symptoms or mucosal injury and often causes nocturnal symptoms.

It is necessary to distinguish and correctly use the concepts "erosive GERD "and "non-erosive GERD". In the first case a reflux esophagitis leads to the occurrence of erosion on a mucosa of a gullet, and in the second – the endoscopic displays of esophagitis are absent or there is a catarrhal reflux esophagitis.

Thus non-erosive reflux disease (NERD) can be a phase of GERD as well as one of the forms of GERD. Generally speaking, the prevalence of GERD among adult population makes 40-60 % where persons with NERD make more than 60 %. In the pathogenesis of NERD the features of the mucosa of the gullet play an important role.

Etyopathogenesis

According to the modern tendencies GERD is considered to be a disease with primary infringement of motor function of the gullet and stomach. The major role in the development of GERD plays the reduction of antireflax barrier, a tone lower sphincter of esophagus, the increase in number of the episodes of an indulgence lower sphincter of esophagus, the decrease in esophageal clearance, and the abilities for auto purification from gastric reluctant and increase in intragastric pressure.

Additional factors which assist in the development of GERD are aggressive factors of gastric contents (a hydrochloric acid, pepsin, bilious acids, in a smaller degree - pancreatic enzymes, such as trypsin, phospholipase A-2) as the background of decrease of the resistance of the esophagus epithelia.

It is necessary to give credit to the motor function of the stomach as a factor which assists the development of GERD to the paresis of the stomach, the decrease in the production of saliva (Shagrena disease), infringement cholinergic innervations of esophagus.
The certain role in the development the GERD is played by the microorganism Helicobacter pylori which is present in the mucous membrane of the cardiac portion of the stomach and negatively influences the course of the reflux esophagitis.

To factors of the development of the GERD also include diaphragmatic hernia, peptic stomach and duodenum ulcer, functional gastric dyspepsia.

Drinks containing caffeine (coffee. tea, cocoa, Coca-Cola, Pepsi-Cola), citron juices and citruses (oranges, lemons, grapefruit, citrons), as well as alcohol, milk, tomatoes and products which are made of

them, horse-radish, garlic, onions, pepper and other spices assist in acid production in the stomach and reduce the tone of the lower sphincter of the esophagus.

The main risk factors of GERD are:

-stress,
-pose (long inclinations of the trunk),
-adiposity,
-pregnancy,
-smoking,
-diaphragmatic hernia,
-medicines (antagonists of calcium, b-blockers, antiholinergical means),
-protective mechanisms against the acid-peptic factor:
-impellent activity of the gullet,
-salivation,
-resistant esophageal epithelia.

Except for the epithelia factor microcirculation also takes part in the protection of the gullet.

Erosion and ulcers of the gullet which arise at repeated episodes of a sour reflux, promote cellular necrosis without adequate epithelial reparation. The final result of this process can be the replacements of flat multilayered epithelia mucous membrane in the distal portion of the esophagus with cylindrical gastric or intestinal epithelia. It is the reason for the verification of the diagnosis of the esophagus of Barret.

Clinical manifestations

Characteristic symptoms of the disease are:

-heartburn;
-acute pain in the throat;
-hiccups sour and air;
-eructation;
The-painful or complicated passage write on a gullet
-sour or salty smack in a mouth;
-pain in the epigastrium

These symptoms arise in 15-30 minutes after the intake of food, especially spicy food, sour juices, alcohol, especially dry faults aerated Coca-Cola, also coffee, chocolate, cocoa. They are also provoked by the products which stimulate synthesis of acid and bile (fried food, intake of soft-boiled eggs, etc.). The sensation is less often observed in the breast with food eructation, belching of acid and bile, faintness, dysphagia, vomiting, feeling of “lump» in the sternum.

All this considerably worsens the quality of life of the patients, reduces their effective work capacity.

Esophageal reflux disease causes:

- pain in the thorax;
-cough (especially at night);
-asthma attacks;
-hoarseness;
-recurrent pneumonias:
-chronic bronchitis with an asthmatic component;
-retrosternal pain and the pain in the pericardial areas as angina (it is necessary to differentiate it with IHD);
-heart arrhythmias;
-caries of teeth is frequent (of a teeth - often; of a tooth-more often) is observed with H3PB.

These complaints are provoked with physical activity like loadings, bending of the trunk, overflow of a stomach liquid, fat, solid and sweet food, alcohol and amplify at night.

The results of physical examination of the patient:

-dryness of the mouth (xerostomia);
-hypertrophic fungiform papilla tongue;
-sometimes left or right phrenic signs (evident with laryngitis and in the combination with hoarseness);

-the lungs can be dry, damp with media, moderate bubbling rattles, alveolar crepitation – with the diseases of the respiratory apparatus;
- infringement of the heart rate, heart arrhythmia;

Complications with GERD

GERD may lead to stricture of esophagus, esophagitis, peptic esophageal ulcer, bleeding from the ulcers of esophagus, esophageal stricture, Barrett's esophagus, and esophageal adenocarcinoma. Factors that contribute to the development of esophagitis include the caustic nature of the refluxate, the inability to clear the refluxate from the esophagus, the volume of gastric contents, and local mucosal protective functions.

Esophagitis may cause odynophagia and even esophageal hemorrhage, which is usually occult but can be massive. Peptic stricture causes a gradually progressive dysphagia for solid foods. Peptic esophageal ulcers cause the same type of pain as gastric or duodenal ulcers, but the pain is usually localized to the xiphoid or high substernal region. Peptic esophageal ulcers heal slowly, tend to recur, and usually leave a stricture on healing.

Such complication as esophagus of Barret can develop. Esophageal metaplasia of the epithelium in a mucous membrane of the distal portion of esophagus (cylindrical epithelium of the stomach or, less often, intestines) can occur owing to additional defeat of protective factors of mucous membrane of esophagus and proliferation its submucous layer - potentially before cancer condition. Other factors which assist the occurrence of esophagus of Barret are hypersecretion of hydrochloric acid, presence of bile in the gastric contents which is the component of the esophageal reluctant. Prevalence of the gullet of Barret among persons with esophagitis comes nearer to 8 % (5-30 %).Malignant adenoma of esophagus in 40 % of cases is associated with Barret's esophagus.

The basic method of diagnostics is histologic research of biopsy material. It is necessary to take the biopsy material from 4 quadrants, since gastroesophageal connections are proximal (1- 2cm).

Immunohistochemical research finds out changes in mucous sucromaltasis - specific marker of Barret epithelium.

Diagnostics

If classic symptoms of heartburn and regurgitation exist in the absence of «alarm symptoms» the diagnosis of GERD can be made clinically and treatment can be initiated.

Alarm Signs/Symptoms include the following: dysphagia, early satiety, gastrointestinal bleeding, odynophagia, vomiting, weight loss, iron deficiency anemia.

The trial of therapy can be induced with H_2-receptor antagonists (H_2RA) or proton pump inhibitors (PPI). Expect response in 2-4 weeks. If no response: change from H_2RA to PPI or maximize dose of PPI.

Patients who do not improve despite the maximum dose of PPI given, or have long-standing symptoms or symptoms of complications, should be studied.

Methods of diagnostics of GERD and Barret's esophagus

Basic, the so-called "gold" standard of diagnostics of GERD is the endoscopic research, calculation of the time of acidulation of the lower third of the esophagus during round-the-clock monitoring of pH in esophagus.

Endoscopy, with cytologic washings and biopsy of abnormal areas, is the test of choice. The mucosal biopsies should be performed at least 5 cm above the LES, as the esophageal mucosal changes of chronic esophagitis are quite frequent in the most distal esophagus in otherwise normal individuals. Endoscopic biopsy is the only test that consistently detects the columnar mucosal changes of Barrett's esophagus. However, endoscopy lacks sensitivity for identifying pathologic reflux. Absence of endoscopic features does not exclude a GERD diagnosis.

Patients with unremarkable endoscopy findings who have typical symptoms despite treatment with PPIs should undergo 24-h pH testing. For pH testing a transnasal catheter or a wireless capsule shaped device is fixed to distal esophagus. Catheter is usually positioned 5cm above manometrically defined upper limit of lower esophageal sphincter. Capsule should be attached 6cm proximal to endoscopically defined squamocolumnar junction. The patient records symptoms, meals, and sleep for 24 h. 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.

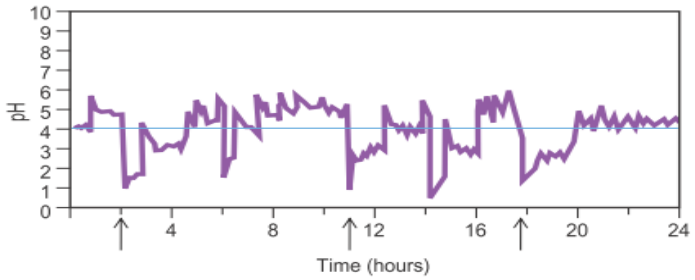


Fig. 6.8 **24-hour intraluminal pH monitoring.** Five reflux episodes (pH < 4) occurred, but only three gave symptoms (arrows).

Barium swallow is generally used for diagnostics of small hiatus hernias. Although barium swallow readily shows esophageal ulcers and peptic strictures, it is less useful for mild to moderate reflux; in addition, most patients with abnormalities require subsequent endoscopy.

A large hiatus hernia is often discovered incidentally on chest x-ray.

A positives tool occult blood test may diagnose bleeding that is coming from the irritation in the esophagus, stomach, or intestines.

Classification

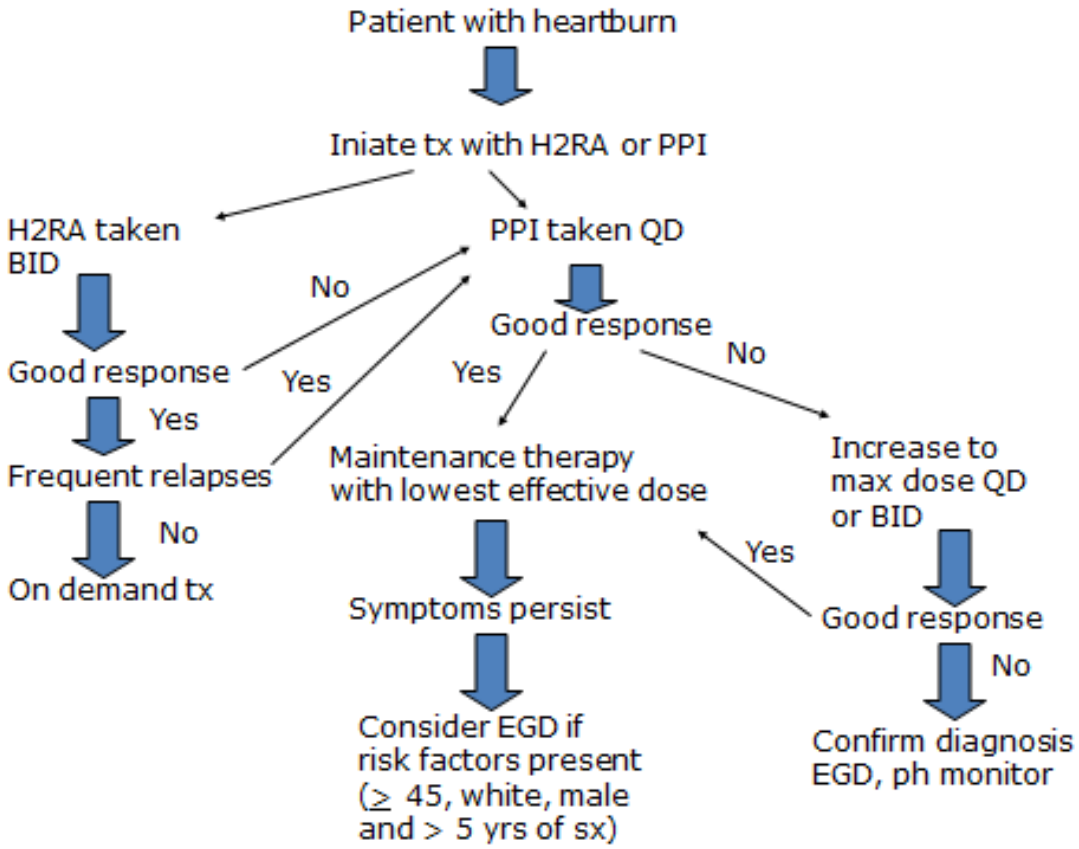
According to the last recommendations, now it is accepted to use **Los-Angeles classification (1998)** of reflux esophagitis which is based on endoscopic criteria which characterize changes of the mucous membrane of esophagus:

Degree A - inflammatory changes in mucosa limited within the limits of fold, to 5 mm;
Degree B - in the mucous membrane is more than 5 mm which extends to 2 folds;
Degree C - changes in the mucous membrane extends to some folds, but not circular;
Degree D - the widespread inflammatory changes in the mucous membrane which extend more than to 75 % of the circle.

Working classification of GERD (Degtjarov 1.1., 2000):

I - degree:
-clinical displays of GERD (presence or absence);
-absence of catarrhal inflammations or erythema of distal portion of the esophagus;
-round-the-clock acidulation in the lower third of the gullet increased to 15-30 minutes
II - degree:
-clinical displays of GERD (urgent patients can be absent);
-erosion of the distal portion of the esophagus which does not merge and does not grasp its greater part;
-round-the-clock acidulation in the lower third of the esophagus increased to 30-40 minutes
III - degree:
-vivid clinical displays of GERD,
-erosion of the distal portion of the esophagus which merges and grasps its greater part;
-round-the-clock acidulation the lower third of the esophagus increased to 60 minutes
IV - degree:
-vivid clinical displays of GERD;
-erosion of the distal portion of the esophagus which merges and grasps all its surface;
-round-the-clock acidulation in the lower third of the esophagus increased to 60 minutes and more a day;
V - degree:
-vivid clinical displays of GERD;
-chronic ulcer and stenosis of the esophagus;
-hemorrhagic complications, Barret's esophagus;
-round-the-clock acidulation in the lower third of the esophagus increased to 60 minutes and more a day

Sequence of GERD diagnostic procedures



The differential diagnosis

1. Tumors of esophagus
2. Spasm of esophagus
3. Peptic strictures of esophagus
4. Hiatus hernia
5. Esophageal diverticulum
6. Achalasia of cardia
7. Scleroderma
8. IHD, aneurysm of aorta
9. Mediastenal adenoma (disease of blood, metastasises, etc.)
10. Postsurgical changes (surgical interventions in the stomach, gullet)

Treatment

The goals of therapy are the following: to achieve symptomatic relief, to heal esophagitis, to avoid complications.

Lifestyle modifications. Change in the way of life is the obligatory precondition of effective treatment of the majority of patients. First of all it is necessary to normalize the weight of the body, to give up smoking and usage of alcohol. It is necessary to avoid physical activity (frequent bending, raising of the bottom finitenesses, etc.). There should be fine food, taken at certain time, the last intake no later 20.00 (3-4 hours before going to bed). Sleep with the raised head. Products which stimulate acid production should be excluded and the tone of the lower esophageal sphincter should be reduced. The usage of liquid during a day and during each reception of food should be restricted. The amount of the first dishes should also be reduced.

The primary goal of treatment GERD is the reduction of the time of contact of an acid with the mucous of the esophagus.

PPIs. The more intensive antisecretory action, the more effective treatment is, therefore inhibitors proton pomp (PPIs) is the preparation to choose the treatment of GERD. To choose the doze and mode of reception of IPP the previous stage of esophagitis is essential. The time during which pH is present in esophagus is to be less than 4, presence of hiatus hernia, the weight of the body, smoking, and also following of the doctor's directions by the patient are important.

Adults can be given omeprazole 20 mg, lansoprazole 30 mg, rabeprazole 20 mg, pantoprazole 40 mg or esomeprazole 40 mg 30 min before breakfast. In some cases, proton pump inhibitors may be given twice daily. Course of treatment – 8 weeks minimum.

PPIs - PARIET (rabeprasolum) is faster than other IPP stop symptoms; it provides the optimum level of pH during day and night. It has the strongest antisecretory action, shows the best structure of safety and is an effective means of treatment of all the forms of GERD. All this makes it a "gold" standard of treatment of this disease.

<table>
<tr><td>GERD. Erosive esophagitis. Individual erosion</td><td>GERD. Erosive esophagitis. Plural erosions</td><td colspan="2">GERD: supported treatment after repair erosions after 26-52 weeks</td><td>NERD</td></tr>
<tr><td>Basic course of treatment for 4 weeks</td><td>Basic course of treatment for 8 weeks</td><td>With the presence of complications</td><td>If there are not complications</td><td>Without instructions with presence of erosive esophagitis in anamnesis</td></tr>
<tr><td colspan="3">Pariet, 20 mg or omeprasolum group, 40 mg or lansoprasolum, 60 mg 1 time a day.</td><td colspan="2">Pariet, 10 mg or omeprasolum group, 20 mg or lansoprasolum, 30 mg 1 time a day. Possible necessarily – take in only with heartburn</td></tr>
</table>

Promotility agents. Prokinetics leads to restoration of the normal physiological condition of the esophagus:

-raise of the tone of the lower sphincter of the esophagus;

-intensification of the peristalsis of the esophagus and stomach;

-improvement of the esophagus clearance.

Metoclopramide 10 mg per os 30 min before meals and at bedtime, domperidone 10 mg per os 30 min before meals and at bedtime.

Antacids are effective in the treatment of moderately expressed and seldom arising symptoms. Antacids which are soaked up are to be taken right after meal; antacids which are not soaked up (almagel) - in 1,5-2 hours. after the intake of food and right before going to bed. These include products such as Maalox, Gaviscon, Rennie, and Almagel.

H2 blockers. Cimetidine 400 mg, ranitidine 150 mg, famotidine 20 mg, nizatidine 150 mg, or roxatidine 75 mg are usually given twice daily.

The most effective medication treatment of GRD overlaps IPP, prokinetics and antacids.

In treatment of a bilious reflux with the combination of IPP and prokinetics it is necessary to add big dozes of the enveloping medication.

Active regular medical check-up of the patients on Barret's esophagus is necessary and is approved by the opportunity to prevent malignant adenoma of esophagitis by means of early diagnostics of epithelia dysplasia, a precancerous condition which is potentially curable.

Antireflux surgery (usually via laparoscopy) is done on patients with serious esophagitis, large hiatal hernias, hemorrhage, stricture, or ulcers. Esophageal strictures are managed by repeated balloon dilation.Tenets of surgery: reduce hiatal hernia, repair diaphragm, strengthen gastroesophageal junction, strengthen antireflux barrier via gastric wrap, 75-90% effective at alleviating symptoms of heartburn and regurgitationSurgery outcomes: 10% of patients have solid food dysphagia, 2-3% have permanent symptoms, 7-10% have gas, bloating, diarrhea, nausea, early satiety. Within 3-5 years 52% of patients are back on antireflux medications. Endoscopic treatment is relatively new and has no definite indications. Well-informed patients with well-documented GERD responsive to PPI therapy may benefit.

There are three categories of endoscopic treatment:

1. Radiofrequency application to increase LES reflux barrier
2. Endoscopic sewing devices
3. Injection of a nonresorbable polymer into LES area

Barret's esophagus. The metaplasia of esophageal squamous epithelium to columnar epithelium (Barret's esophagus) is a complication of severe reflux esophagitis, and it is a risk factor for the development of esophageal adenocarcinoma.

Mechanism of formation: acid damages lining of esophagus and causes chronic esophagitis; damaged area heals in a metaplastic process and abnormal columnar cells replace squamous cells (columnar epithelium is more resistant to acid-pepsin damage than is squamous epithelium). Barret's epithelium progresses through a dysplastic stage before developing into adenocarcinoma.

Barret's esophagus should be managed the same way as GERD. In case if dysplasia is absent endoscopy should be done every 3 years. In patients with dysplasia - annual to shorter interval surveillance.

Once high-grade dysplasia is detected, treatment of choice is esophagectomy of Barret's segment. Photodynamic laser or thermocoagulative mucosal ablation and endoscopic mucosal resection are being evaluated as alternatives.

Summary. Incompetence of the lower esophageal sphincter allows reflux of gastric contents into the esophagus, causing burning pain. Prolonged reflux may lead to esophagitis, stricture, and rarely metaplasia or cancer. Diagnosis is clinical, sometimes with endoscopy, with or without acid testing. Treatment involves lifestyle modification, acid suppression using proton pump inhibitors, and sometimes surgical repair.

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 year 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 year old employee had pains in epigastrium which were accompanied with the heartburn. Reception peep removes the pain. He often takes soda which 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 year 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 year 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

9. The 49 year 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

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. Barret 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. Barret's 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 Barret's 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 rabeprasolum 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

Situational tasks

1. The 37 year old patient complains of a pain in epigastrium, which occurs more often during sleeping, a heartburn which amplifies after the food intake. Objectively belly is painless during the palpation; the liver and spleen are not palpated. What diagnosis is the most probable?
   A. Cancer of the stomach

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

2. The 21 year old patient is pregnant (30 weeks of pregnancy) complains of a constant heartburn, eructation. Before the pregnancy she did not suffer from this. What could this be caused by?

A. Weakened function of the antireflux barrier
B. Weakened clearance of the esophagus
C. Increase in the intrabelly pressure
D. Violation of the stomach evacuation
E. Incompetence of the mucous membrane of the gullet to resist the action of contents in the stomach which will be thrown to the gullet

3. The patient who suffers from the bronchial asthma complains of the attacks of asthma which arise during bending of the trunk or in the horizontal position. These complaints were regarded as the attacks of the bronchial asthma, but usual means of eliminating them have not given any results. How is it possible to explain the given phenomenon?

A. Drag habit
B. It is necessary to increase the dosage of the medication which is usually used
C. Presence of the incorporated pathology (GERD)
D. It is necessary to change the medication to eliminate the attacks
E. It is necessary to add one more means

4. The patient complains of the heartburn and eructation, the complicated passage of the peep into the gullet. Bernstein's investigation showed the positive test. What disease is it characteristic of?

A. Ulcer of the stomach
B. Chronic gastritis
C. Chronic pancreatitis
D. GERD
E. Gallbladder dyskinesia

5. The 22 year old patient who is being examined and treated at the gastroenterological department has been given the diagnosis GERD. What combination of groups of medicines is the most effective for the treatment?

A. Spasmolytics + antacids
B. Analgetics + antacids
C. Antibacterial medicines +inhibitors of proton pomp
D. Hepatoprotectors + blockers H2-receptors of histamine
E. Inhibitors of proton pomp + prokinetics

6. The patient complains of a pain which periodically arises in epigastrium during sleeping and heartburn after the food intake. Objectively the patient has excessive weight of the body. Which organs are most possibly affected?

A. Stomach
B. Gallbladder
C. Pancreas
D. Intestine
E. Esophagus

7. A woman is delivered to the hospital with a pain under xiphoid process which appeared during sleeping, it was accompanied with faintness and disposable vomiting with the impurity of blood. In the anamnesis: complaints of the heartburn during last year, the belly takes part in the act of breathing, with moderate morbidity in the epigastrium. What is the most possible reason of the abdominal pains?

A. Myocardial infarction
B. Acute gastritis
C. Acute pancreatitis
D. “Attack” of cholecystitis
E. GERD

8. The 48 year old patient complains of a periodic pain in epigastrium which amplifies during bending of the trunk, heartburn after any food intake. After taking of 20 mg of rabeprasolum during the first day these symptoms disappeared. What disease is this clinical picture characteristic of?

A. Chronic gastritis type B
B. Ulcerative disease of the duodenum
C. GERD
D. Chronic pancreatitis
E. Chronic hepatitis

9. During PGDS in the man with gastric dyspepsia Barret's gullet was discovered. What disease is this complication characteristic of?

A. Ulcerative disease of the stomach
B. Chronic gastritis type A
C. Chronic pancreatitis
D. GERD
E. Chronic hepatitis

10. In the patient during PGDS the plural erosion of the gullet was discovered. What disease is this occurrence connected with?

A. GERD, non- erosive form
B. GERD, erosive form
C. Chronic gastritis type A
D. Cholelithiasis
E. Ulcerative disease of the stomach

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. This was given to her by a neurologist from the hospital where she works.

1. 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

2. 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.

3. 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.

4. 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.

5. 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

6. 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

7. 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

Gastroenterology (the initial level of knowledge)

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

Gastroenterology (the final level of knowledge)

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

Right answers

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

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: althought 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.

Situational tasks on diagnostics and treatment of patients with GERD (with full justification of answer)

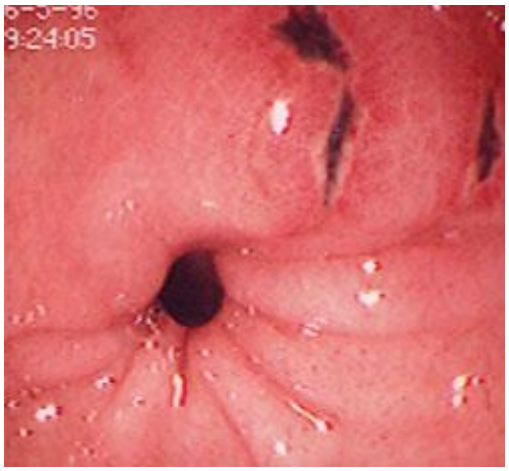
1. A 60-year-old white male presents to your office with a 20 year history of daily heartburn, acid regurgitation and intermittent dysphagia. His endoscopy is shown in the figure. Biopsies confirm the presence of specialized intestinal metaplasia with low grade dysplasia. The best medical regimen for 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. *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.His 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's 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 painful syndrome of GERD.
4. The characteristic dyspeptic syndrome of GERD.
5. External esophageal displays of GERD.
6. Name the methods of diagnostics of GERD.
7. Name the complication with GERD.
8. Clinical displays and diagnostics of the gullet of Barret
9. Principles of treatment of patients with GERD
10. The way of life and diet therapy for the patients with GERD.
11. Medication therapy with GERD
12. Surgical treatment with GERD
13. Prevention of GERD

Practical tasks

1. Treat the patients with GERD.
2. Interpret the received results of the laboratory methods of research
3. Give the interpretation of the received results of tool methods of researches
4. Write down the recipes concerning the treatment of GERD.