Ministry of Healthcare of Ukraine

Poltava State Medical University

Approved
at the meeting of Internal Medicine №1
Department "____"_____
Protocol № ____ from _____
The Head of the Department
Associate Professor Maslova H.S.
_____

Methodical guidelines
for students' self-studying to prepare
for practical (seminar) classes and on the lessons

Academic discipline	Internal medicine
Module №	1
Topic of the lesson	**Irritable bowel syndrome**
Course	IV
Faculty	of foreign students training

1. **Relevance of the topic**: **Irritable bowel syndrome (IBS)** is a functional gastrointestinal (GI) disorder characterized by abdominal pain and altered bowel habits in the absence of a specific and unique organic pathology. Population-based studies estimate the prevalence of IBS at 10%-20% and the incidence at 1%-2% per year.

2. Certain aims:

- To be able to assess the typical clinical picture of IBS, to determine tactics of treatment and prophylaxis;
- To select the information indicating the presence of IBS, in a patient from the data history;
- To create a scheme of diagnostic search;
- To identify the signs of intestinal disorders in an objective study of the patient (general examination, palpation, percussion, auscultation);
- To analyze and interpret the changes in the results of the laboratory and instrumental methods of investigation, depending on the course of the disease;
- To conduct differential diagnostics of diseases with the similar clinical picture;
- To develop a strategy of treatment;
- To provide medical care;
- To assess the patient's prognosis and to propose a plan of preventive actions.

3. **Basic knowledge, abilities, skills required to study the topic (interdisciplinary integration).**

Names of previous disciplines	Obtained skills
1. Anatomy 2. Histology 3. Physiology 4. Pathology 5. Radiology 6.Propaedeutic internal medicine 7. Pharmacology	To describe the structure of the gastrointestinal tract, blood supply and innervation; to establish the preliminary diagnosis, to use additional methods of examination and interpret their data to make final diagnosis; to manage the patient with IBS; to classify IBS; drugs for treatment; to draw a scheme of patient's follow-up; to compare IBS with other diseases with the same symptoms; to demonstrate practical skills during physical examination of the patient,

	analyzing the clinical and laboratory results.

4. Tasks for self-studying to prepare for the lesson and on the lesson.

4.1. List of main terms, parameters, characteristics that should be learnt by student during preparation for the classes:

Term	Definition
Irritable bowel syndrome	is a functional bowel disorder in which recurrent abdominal pain occurs at least 1 day per week during the past 3 months and is associated with defecation or a change in bowel habits.
Constipation	is a disorder which occurs when bowel movements become less frequent and stools become difficult to pass.
Diarrhea	is the condition of having at least three loose, liquid, or watery bowel movements each day

4.2. Theoretical questions for the lesson:

1. Give the definitions of irritable bowel syndrome.
2. Specify the risk factors of irritable bowel syndrome.
3. Name the pathophysiological mechanisms of irritable bowel syndrome.
4. Name the diagnostic criteria of irritable bowel syndrome.
5. What are the endoscopic characteristics of irritable bowel syndrome?
6. Modern classification of irritable bowel syndrome.
7. Specify the principles and features of irritable bowel syndrome pharmacotherapy according to modern recommendations.
8. What lifestyle modifications should be recommended for patients with irritable bowel syndrome?

4.3. Practical work (tasks), performed on the lesson:

1. Interpret changes in the signs of irritable bowel syndrome in an objective study of the patient (general examination).
2. Make preliminary diagnosis for patient with irritable bowel syndrome.

3. Prescribe relevant laboratory and instrumental investigations for patient with irritable bowel syndrome.
4. Interpret data of instrumental methods of investigation, depending on the course of irritable bowel syndrome.
5. Manage the patient with irritable bowel syndrome, prescribe further treatment.

Topic Content:

IRRITABLE BOWEL SYNDROME

Definition. Irritable bowel syndrome (IBS) is a functional bowel disorder (FBD) in which recurrent abdominal pain occurs at least 1 day per week during the past 3 months and is associated with defecation or a change in bowel habits. Symptom onset should occur at least 6 months before diagnosis and symptoms should be present during the last 3 months.

Classification. IBS subtypes related to bowel habit abnormalities:

1) IBS with predominant constipation: More than 25% of bowel movements with Bristol stool form types 1 or 2 and less than 25% of bowel movements with Bristol stool form types 6 or 7. Alternative for clinical practice: Patient reports that abnormal bowel movements are usually constipation (like type 1 or 2 in the picture of Bristol Stool Form Scale (BSFS)).
2) IBS with predominant diarrhea (IBS-D): more than 25% of bowel movements with Bristol stool form types 6 or 7 and less than 25% of bowel movements with Bristol stool form types 1 or 2. Alternative for clinical practice: Patient reports that abnormal bowel movements are usually diarrhea (like type 6 or 7 in the picture of BSFS).
3) IBS with mixed bowel habits (IBS-M): more than 25% of bowel movements with Bristol stool form types 1 or 2 and more than 25% of bowel movements with Bristol stool form types 6 or 7. Alternative for clinical practice: Patient reports that abnormal bowel movements are usually both constipation and diarrhea (more than one-fourth of all the abnormal bowel movements were constipation and more than one-fourth were diarrhea, using picture of BSFS).
4) IBS unclassified (IBS-U): Patients who meet diagnostic criteria for IBS but whose bowel habits cannot be accurately categorized into 1 of the 3 groups above should be categorized as having IBS unclassified.

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shape but lumpy
Type 3		Like a sausage but with cracks on surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clear-cut edges (passed easily)
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces, entirely liquid

Epidemiology. The world-wide prevalence of IBS is 11,2%. Prevalence rates are higher for women than for men; younger people are more likely to be affected than those older than age 50 years.

Etiological and risk factors. Factors that increase the risk of developing IBS include genetic, environmental, and psychosocial factors. Factors that trigger the onset or exacerbation of IBS symptoms include a prior gastroenteritis, food intolerances, chronic stress, diverticulitis, and surgery. IBS is associated with more psychiatric distress, sleep disturbance, “affective vulnerability,” and “over-adjustment to the environment.”

Pathogenesis. IBS is a multifactorial disorder with a complex pathophysiology. The resulting pathophysiologic mechanisms are variable and patient independent, and include altered gastrointestinal (GI) motility, visceral hyperalgesia, increased intestinal permeability, immune activation, altered microbiota, and disturbances in brain-gut function.

Diagnostic Criteria: recurrent abdominal pain, on average, at least 1 day per week in the last 3 months with symptom onset at least 6 months before diagnosis, associated with 2 or more of the following criteria:

1. Related to defecation
2. Associated with a change in frequency of stool.
3. Associated with a change in form (appearance) of stool.

Diagnosis. For the majority of patients, when diagnostic criteria for IBS are fulfilled and alarm features are absent, the need for diagnostic tests should be minimal.

The diagnosis of IBS should be made based on the following 4 key features: clinical history; physical examination; minimal laboratory tests; and, when clinically indicated, a colonoscopy or other appropriate tests.

Pain can be present anywhere throughout the abdomen, although it is more common in the lower abdomen. A history of disordered bowel habits (eg, constipation or diarrhea or both) should be identified, along with their temporal association with episodes of abdominal pain. Abdominal bloating is present in a majority of IBS patients; abdominal distention may be reported as well, although neither is required to make the diagnosis of IBS. Abnormal stool frequency (>3 bowel movements/day and <3 bowel movements/week) abnormal stool form (types 1-2 or 5-6 of the Bristol scale), excessive straining during defecation, defecatory urgency, feelings of incomplete evacuation, and mucus with bowel movements, although common in IBS, are not specific.

A physical examination should be performed in every patient evaluated for IBS. This reassures the patient and helps to exclude an organic etiology. An anorectal examination is mandatory to identify anorectal causes of bleeding, evaluate anorectal tone and squeeze pressure, and identify dyssynergic defecation.

The next step in the diagnosis of IBS is to perform limited laboratory studies, if not previously performed. A complete blood count (CBC) should be ordered, as the finding of anemia or an elevated white blood cell count warrants further investigation. A C-reactive protein or fecal calprotectin should be measured, as these tests are helpful in excluding IBD in patients with symptoms suggestive of nonconstipated IBS. If inflammatory markers are mildly elevated, but the probability of IBD is low, then tests should be remeasured before performing colonoscopy (if no other indication for colonoscopy exists). Inflammatory markers, including fecal calprotectin, may not be useful in patients with constipation symptoms. Routine thyroid tests are not indicated in all patients, but can be checked if clinically warranted. Serologic tests for celiac disease should be performed in patients with IBS-D and IBS-M who fail empiric therapy. Upper gastrointestinal endoscopy with duodenal biopsies should be performed if serologic tests for celiac disease are positive or if clinical suspicion is high; duodenal biopsies can also be used to identify tropical sprue, which can mimic IBS symptoms. Stool analysis (bacteria, parasites, and ova) may be useful if diarrhea is the main symptom, especially in developing countries where infectious diarrhea is prevalent. A screening colonoscopy is indicated in patients 50 years and older in the absence of warning signs (45 years in African Americans), based on national recommendations. Colonoscopy is also indicated for the presence of alarm symptoms or signs, a family history of colorectal cancer and persistent diarrhea that has failed empiric therapy. Biopsies of different segments of the colon may be required in patients with chronic diarrhea to rule out microscopic colitis. Bile acid malabsorption may be the cause of persistent, watery diarrhea in some patients. If empiric therapy fails, scintigraphic evaluation (75SeHCAT test) or postprandial

serum C4 (7a-hydroxy-4-cholesten-3-one) or fibroblast growth factor 19 are diagnostic options, although none are currently widely available. Breath tests to rule out carbohydrate malabsorption may be useful in some patients with IBS symptoms and persistent diarrhea.

Differential diagnosis. Inflammatory bowel disease, celiac disease, lactose and fructose intolerance, and microscopic colitis.

Treatment. Treatment should be based on symptom type and severity.

Lifestyle modifications that may improve IBS symptoms include exercise, stress reduction, attention to impaired sleep, dietary fiber supplementation remain a cornerstone of IBS management.

***IBS-C therapy*.** Several peripherally acting agents are available to treat IBS-C symptoms. Lubiprostone (8 mg bid) is a luminally acting prostone that selectively activates type 2 chloride channels. Linaclotide is a 14-amino acid peptide that acts as a guanylate cyclase C agonist (290 mg qd). Psyllium (up to 30 g/d in divided doses) can be recommended. Different probiotics may also benefit IBS patients.

IBS-D therapy. Loperamide (2-4 mg; when necessary, titrate up to 16 mg/d), a synthetic peripheral m-opioid receptor agonist that decreases colonic transit, and increases water and ion absorption, is commonly used to treat IBS-D patients. There is increasing evidence to support a role for bile acids (cholestyramine 9 g bid-tid; colestipol 2 g qd-bid; colesevelam 625 mg qd-bid) in the pathophysiology of IBS-D. The US Food and Drug Administration approved rifaximin (550 mg 3 times daily 14 days), a nonabsorbable antibiotic, for the treatment of IBS-D. Alosetron (0.51 mg bid), a highly selective 5-HT3 antagonist, is effective at relieving pain and reducing stool frequency. Other 5-HT3 antagonist can be useful too (Ondansetron 4-8 mg tid; Ramosetron 5 mg qd). Eluxadoline (100 mg bid) is a novel mixed m-receptor agonist/d-opioid receptor antagonist that has been developed as a treatment for patients with IBS-D. Small number of patients experienced sphincter of Oddi dysfunction or self-limited pancreatitis, so Eluxadoline should be used at the lower dose and with careful monitoring in patients who had a history of cholecystectomy or significant ethanol consumption.

Abdominal pain therapy. Smooth muscle antispasmodics (Dicycylomine 10-20 mg qd-qid; Otilonium 40-80 mg bid-tid; Mebeverine 135 mg tid) are used to treat abdominal pain and spasms in all IBS subtypes. Lubiprostone, Linaclotide, Alosetron, Peppermint oil (enteric-coated capsules, 250-750 mg, bid-tid) also have pain relieving activity.

Tricyclic antidepressant agents (Desipramine 25-100 mg qhs; amitriptyline 10-50 mg qhs) appear effective in treating IBS symptoms. Few data are available on the use of selective serotonin reuptake inhibitors in IBS (Paroxetine 10-40 mg

qd; Sertraline 25-100 mg qd; Citalopram 10-40 mg qd). Psychological and behavioral treatments relate to helping patients control and reduce pain and discomfort and are seen as ancillary to or augmenting medical treatments. Treatments include cognitive behavioral therapy, hypnosis, and various relaxation methods to reduce muscle tension and autonomic arousal believed to aggravate GI symptoms.

Materials for self-control:

A. Tests and situational tasks for self-control:

1. Patient D., 48 years old, complains of pain in the lateral part of abdomen, that diminishes after defecation with gases, alternation of diarrhea and constipations. In the anamnesis: dysentery 2 years ago. Palpation of abdomen is painful, with abdominal murmur of colon. What method of examination is the most informative to make up the diagnosis?

A. Rectoromanoscopy
B. Rectal finger exam
C. Colonoscopy
D. Coprocytogram in dynamics
E. US examination of abdominal cavity

2. A 43 y.o. male complains of stomach pain, which relieves after defecation, and is accompanied by abdominal winds, rumbling, the feeling of incomplete evacuation or urgent need for bowel movement, constipation or diarrhea in alternation. These symptoms have lasted for over 3 months. No changes in laboratory tests. What is the most likely diagnosis?

A. Irritable bowel syndrome
B. Spastic colitis
C. Colitis with hypertonic type dyskinesia
D. Chronic enterocolitis, exacerbation phase
E. Atonic colitis

3. A 24 y.o. male complains of abdominal spastic pain, which occurs after emotional stress, relieves with defecation, and is accompanied by abdominal winds, constipation and the feeling of incomplete evacuation. These symptoms have lasted for over 3 months. No changes in laboratory tests, GDS and colonoscopy. What is the most proper treatment of constipation?

A. Antidepressants
B. Antibiotics
C. Lactulose

D. Loperamide
E. Fluocsetine

4. A 33 y.o. woman consulted a doctor about occasional pains in paraumbilical and iliac region that reduce after defecation or passage of gases. Defecation takes place up to 6 times a day, stool is not solid, without mucous and blood. Appetite is normal, she has not put off weight. First such symptoms appeared 1,5 year ago, but colonoscopy data reveals no organic changes. Objectively: abdomen is soft, a little bit painful in the left iliac region. Blood and urine analyses are normal. What is the possible and the most proper treatment of diarrhea in this case?

A. Loperamide
B. Probiotics
C. Antibiotics
D. Lactulose
E. Polyvitamins

5. Irritable bowel syndrome is a functional bowel disorder in which recurrent abdominal pain occurs:

1) at least 3 days per week during the past 1 months and is associated with defecation or a change in bowel habits. Symptom onset should occur at least 6 months before diagnosis and symptoms should be present during the last 3 months.

2) at least 1 day per week during the past 3 months and is associated with defecation or a change in bowel habits. Symptom onset should occur at least 6 months before diagnosis and symptoms should be present during the last 3 months

3) at least 1 day per week during the past 3 months and is associated with defecation or a change in bowel habits. Symptom onset should occur at least 9 months before diagnosis and symptoms should be present during the last 3 months.

4) at least 1 day per week during the past 3 months and is associated with defecation or a change in bowel habits. Symptom onset should occur at least 1 year before diagnosis and symptoms should be present during the last 6 months.

6. Which of the following infections has been associated with an increased prevalence of IBS?

A) Giardia lamblia
B) Escherichia coli
C) Shigella
D) Salmonella
E) helicobacter pylori

7 . What is the most frequent psychiatric comorbidity in IBS?

A) Panic disorder

B) Major depressive disorder

C) Generalized anxiety disorder

D) Post-traumatic stress disorder

E) Depressive disorder

8. What is perhaps the most bothersome IBS symptom to patients?

A) Fatigue

B) Nausea

C) Indigestion

D) Abdominal bloating

E) Generalized anxiety disorder

9. A 35 y. o. woman consulted a doctor about occasional pains in paraumbilical and iliac region that reduce after defecation or passage of gases. Defecation takes place up to 6 times a day, stool is not solid. Appetite is normal, she has not put off weight. First such symptoms appeared 1,5 year ago, but colonoscopy data reveals no organic changes. Objectively: abdomen is soft, a little bit painful in the left iliac region. Blood and urine are normal. What is the probable diagnosis? What treatment can be prescribed to improve quality of life of the patient?

The answers for the tests:

1-C, 2-A, 3-C, 4-A, 5-B,6-A. 7-A, 8-D.

9. Irritable bowels syndrome with predominant diarrhea. Loperamide 2 mg per os.

Recommended literature

I. Main:

1. Internal Medicine: in 2 books. Book 1. Diseases of the Cardiovascular and Respiratory Systems: textbook / N.M. Seredyuk, I.P. Vakaliuk, R.I. Yatsyshyn et al. Київ, Медицина., 2019. - 664 + 48 кольор. вкл.).
2. Internal medicine: Part 1 (cardiology, rheumatology, haematology): textbook for English-speaking students of higher medical schools / edited by Professor M.A. Stanislavchuk and Professor V.A. Serkova. - Vinnytsia: Nova Knyha, 2019. - 392 p.

3. Медицина за Девідсоном: принципи і практика / Навчальний посібник: пер. 23-го англ. вид.: у3 т. Т.3 С. Ралстона, Я. Пенмана, М. Стрекена, Р. Гобсона; К.: ВСВ «Медицина», 2021. – 642 с.
4. CURRENT Medical Diagnosis and Treatment 2012, Fifty-First Edition (LANGE CURRENT Series) by Stephen McPhee, Maxine Papadakis and Michael W. Rabow (Paperback - Sep 12, 2011)/
5. Побічнадіяліків – SideEffectsofMedications: навчальнийпосібнику 2 т. / зазаг.ред. В.М. Бобирьова, М.М. Потяженка. – Вінниця:
6. Cardiovascular diseases. Classification, standards of diagnosis and treatment / Edited by Academician Kovalenko V.M., Prof. Lutaia M.I., Prof. Sirenko Yu.M., Prof. Sychova O.S. – Kyiv. – 2020.
7. Perederii V.H., Tkach S.M. Principles of internal medicine. – Vol.2 / Textbook for students of higher educational institutions. – Vinnytsia: Nova knyha. – 2018.
8. Internal diseases. The textbook based on the principles of evidentiary medicine, 2018.

II. Additional literature:

1. Recommendations of the Association of Cardiologists of Ukraine for the diagnosis and treatment of chronic heart failure / Voronkov L.H. – moderator, working group of the Ukrainian Association of Heart Failure Specialists. – 2017.
2. Respiratory diseases / Ghanei M. - In Tech, 2012. - 242 p.
3. Clinical respiratory medicine / Spiro S., Silvestri G., Agusti A. - Saunders, 2012. - 1000 p.
4. Principles and practice of interventional pulmonology / Ernst A., Herth F. - Springer, 2012. - 757 p.
5. Clinical respiratory medicine / Spiro S., Silvestri G., Agusti A. - Saunders, 2012. - 1000 p.

6. Petrov Y. The chief symptoms and syndromes in patients with cardiovascular pathology : The practical handbook fur medical students / Ye. Petrov, Yu. Goldenberg, N. Chekalina; UMSA. - Poltava : TexcepBic, 2010. - 143 .
7. Gastroenterology and Hepatology Board Review: Pearls of Wisdom, Third Edition (Pearls of Wisdom Medicine) by John K. DiBaise (May 11, 2012)
8. Clinical Pulmonology 2012 (The Clinical Medicine Series) by M.D., C. G. Weber (Oct 30, 2011) - Kindle eBook
9. Clinical Nephrology 2012 (The Clinical Medicine Series) by M.D., C. G. Weber (Sep 19, 2011) - Kindle eBook
10. Clinical Nephrology 2012 (The Clinical Medicine Series) by M.D., C. G. Weber (Sep 19, 2011) - Kindle eBook
11. Hematology: Clinical Principles and Applications, 4e by Bernadette F. Rodak MS MLS (Feb 18, 2017)
12. Rheumatology, 2-Volume Set: EXPERT CONSULT - ENHANCED ONLINE FEATURES AND PRINT, 5e by Marc C. Hochberg MD MPH, Alan J. Silman MD, Josef S. Smolen MD and Michael E. Weinblatt MD (Oct 19, 2019)
13. Endocrine Pathology: Differential Diagnosis and Molecular Advances by Ricardo V. Lloyd (Nov 5, 2018)
14. Clinical Endocrinology 2012 (The Clinical Medicine Series) by M.D., C. G. Weber (Sep 19, 2017) - Kindle eBook
15. Williams Textbook of Endocrinology: Expert Consult-Online and Print, 12e by Shlomo Melmed, Kenneth S. Polonsky MD, P. Reed MD Larsen and Henry M. Kronenberg MD (May 27, 2016)
16. Electrocardiography, 3e with Student CD (Booth, Electrocardiography for Health Care Personnel) by Kathryn A. Booth (Jan 27, 2017)
17. Echocardiography Review Guide: Companion to the Textbook of Clinical Echocardiography: Expert Consult: Online and Print, 2e (Expert Consult Title: Online + Print) by Catherine M. Otto (Mar 7, 2017).