Current positions regarding the diagnosis and screening of colorectal cancer and precancerous changes of bowel. Analysis of clinical cases

Abstract. The article deals with the problem of colorectal cancer and precancerous changes of bowel. Risk factors, clinical symptoms, diagnostic methods, directions for the prevention of colorectal cancer and precancer are considered. Three clinical cases of patients with bowel tumors and precancerous conditions are given and analyzed. The article places special emphasis on the need for timely detection of tumors and screening for colorectal cancer. Screening options are shown, each of the screening methods is analyzed. Screening algorithms based on the practical guidelines of different countries are given. The relevance and importance of the problem of colorectal cancer and precancerous changes are emphasized.

Keywords: colorectal cancer; precancerous bowel changes; risk factors; diagnosis; screening; prevention

The problem of colorectal cancer (CRC) is very relevant in modern medicine. According to the World Health Organization, CRC ranks third in terms of frequency among all oncological diseases. Approximately 10 % of all cancer cases are due to CRC. However, in terms of mortality rates, CRC ranks second among all oncological diseases. In 2020, more than 1.9 million new cases of CRC were detected worldwide, and more than 930,000 people with CRC died. The incidence of CRC is highest in European countries, in Australia and New Zealand, but mortality from CRC is highest in Eastern Europe [1].

Unfortunately, according to the National Cancer Registry of Ukraine, the incidence of CRC continues to increase [2]. The incidence of rectal cancer in Ukraine was 21.2 cases per 100,000 population, the mortality rate was 11.7 cases per 100,000 population. The American Cancer Society estimates that 104,610 new cases of colon cancer will be diagnosed in the United States in 2020. Estimated mortality from colon and rectal cancer for 2020 in USA was 53,200 patients [3].

Unified clinical protocol of primary, secondary, tertiary medical care and medical rehabilitation of colorectal cancer (No. 703) regulates the actions of doctors, directs the timely detection of this pathology and adequate treatment of precancerous lesions [2].

It is clear that the treatment of CRC is primarily carried out by oncologists, oncoproctologists, oncosurgeons and chemotherapists. But the task of general practitioners, therapists, and gastroenterologists is, firstly, to prevent the development of CRC, and secondly, to achieve early detection of CRC and precancerous changes. In this connection, the screening of CRC is of particular importance.

Answering the first question (how to prevent CRC?), risk factors for CRC should be identified and their elimination (if possible) or control (if it is impossible to eliminate them) should be carried out. There are certain known risk factors for CRC. In the presence of these risk factors, CRC develops more often than without them. However, a tumor can arise in the absence of these factors. Knowledge of such factors is important for more accurate diagnosis, as well as for timely prevention.

According to the recommendations of the European Society of Medical Oncology (ESMO), such factors are the following [4]. First of all, the risk of CRC increases with age: in the vast majority of patients, colon cancer occurs over the age...
of 50, but this form of cancer can also be observed in younger people. It has been proven that the risk of CRC increases with frequent consumption of red meat (beef, pork, lamb) by patients, as well as processed meat (for example, hot dogs, etc.), with consumption of high fat content and low fiber content (i.e. vegetables and fruits). Smoking and alcohol abuse increase the risk of colon polyps and CRC. Metabolic disorders (obesity, type 2 diabetes) and sedentary lifestyle also increase the risk of CRC. Family history is also an important factor — the presence of CRC increases if close relatives have or have had CRC, this is primarily due to genetics, but can also be caused by shared environmental factors. The most common bowel lesions that provokes CRC are adenomatous polyps — these benign formations can become malignant over time. A history of CRC increases the risk of new cancer — if a patient has previously had bowel cancer and it has been completely removed, the risk that another bowel tumor may develop is higher than in the general population. The previous history of other types of cancer should also be taken into account — if the patient has some other forms of cancer in the past (testicular cancer, endometrial cancer, lymphoma, and others), the risk of bowel tumor increases. Another risk factor is inflammatory bowel disease (ulcerative colitis and Crohn’s disease); in the presence of these diseases, the patient may develop dysplasia, which can transform into cancer; the risk of developing dysplasia and cancer increases with long-term inflammatory diseases (more than 8 years) and greater prevalence of the pathological process in bowel. There are also rare genetic diseases in which the risk of bowel cancer is particularly high — familial adenomatous polyposis and hereditary nonpolyposis CRC (Lynch syndrome).

According to the above-listed risk factors for the development of CRC, prevention directions can be formulated. It is necessary to follow a healthy diet (eat more vegetables and fruits, reduce as much as possible the use of red meat and processed meat, as well as saturated fats); do not smoke and do not abuse alcohol; lead an active lifestyle, avoid inactivity, reduce weight in case of obesity. In the presence of adenomatous polyps, it is necessary to remove them endoscopically and perform control endoscopies in the future. After treated intestinal tumors, it is important to carry out careful endoscopic monitoring of bowel. In the presence of inflammatory bowel diseases, they should be treated in a timely manner and endoscopic (and histological) monitoring should also be carried out. And it is very important — when reaching the age of more than 50 years, at a younger age with a burdened heredity for CRC, if there is a history of treated tumors of another localization — to conduct CRC screening.

Answering the second question (how to achieve early detection of CRC?), it should be noted that, unfortunately, early diagnosis of CRC is not always an easy task. In the early stages of CRC, there may be no symptoms at all, or the symptoms may be non-specific, characteristic for other pathological conditions.

Among the possible symptoms of CRC, it should be noted, first of all, the presence of blood in the stool — blood in the stool is a symptom of anxiety, the blood can be bright light red (in the case of damage of rectum), it can be dark red in color (in the case of tumor localization in the large intestine) or even black (tarry) in color (when the tumor is localized in more proximal parts of the intestine). With tumors of the colon or rectum, there may be defecation disorders — diarrhea, constipation, narrowing of fecal masses; however, these changes are non-specific and may be present in other (safer) diseases. Intestinal pain, colic, bloating are also non-specific symptoms that can be present in CRC, but are more common in other pathological conditions. Possible symptoms of CRC should also include unmotivated weight loss. Some patients may have general weakness — of course, this symptom is very non-specific and may be present in many other diseases. In the presence of anemia, in addition to paying attention to the stomach and gynecological organs, the bowel should always be considered as a possible cause of anemia; when colon cancer is localized in the right parts of the bowel, anemia can be the only manifestation of the disease. The feeling of incomplete emptying can occur in the presence of a tumor in the lower part of the rectum, although it can also occur in other diseases. One of the first manifestations of CRC can be the development of partial intestinal obstruction, when the tumor partially blocks the intestinal lumen and interferes with the normal passage and evacuation of fecal masses.

The presence of a dense mass on palpation of the abdomen or on digital examination of the rectum can also indicate a tumor of the colon or rectum. But in most patients with CRC, these dense masses are absent during physical examination.

It is clear that endoscopic examination (first of all, colonoscopy) and histological examination of biopsies play a key role in the diagnosis of CRC. Computer tomography (CT), magnetic resonance imaging (MRI), and irrigography can also indicate the possibility of a bowel tumor in some cases.

In the diagnostic algorithm of the doctor, the same symptoms should be targeted for oncological search: persistent or periodic bleeding, changes in bowel functioning, weight loss, iron deficiency anemia, abdominal pain. According to the protocol, the doctor’s actions are necessary: collection of complaints, history, symptoms, physical examination, digital examination of the rectum, ultrasound examination of the organs of the abdominal cavity, pelvis and retroperitoneal space, X-ray examination of the chest cavity, colonoscopy with biopsy of the tumor and morphological examination of the biopsy material, esophagogastroduodenoscopy, CT scan of the abdominal cavity, pelvis, retroperitoneal space with intravenous contrast, MRI of the abdominal cavity and pelvis [2].

The majority of patients who turn to a general practitioner for help are comorbid patients who have three or more diseases, take many medications, and have a long history. In addition, the clinical manifestations of tumors are quite diverse, there are no signs that would be pathognomonic only for them. The histological structure of tumors usually does not have a noticeable effect on the clinical picture, which mostly depends on the type of tumor growth, size and localization [2].

The aim of this article: to analyze the clinical cases of CRC and precancerous bowel changes and to describe the approach for screening for these pathological processes.

We would like to show and analyze 3 clinical cases from this topic.
Clinical case 1

The patient is 53 years old and was admitted to the Institute of Gastroenterology of the National Academy of Medical Sciences of Ukraine for inpatient treatment.

Complaints. Itching of the skin of the upper and lower extremities and scalp, pain in the epigastrium, right and left hypochondrium, nausea, heartburn, belching, bitterness in the mouth, constipation, weakness. The pain is pronounced, pressing in nature, occurs an hour after eating.

Anamnesis. She considers herself sick for about a year, when complaints first appeared, she sought medical help. Suffering from neurodermatitis for about 30 years, she is constantly under the supervision of a dermatologist, but the treatment brought a partial effect. In the last 6–8 months, manifestations of neurodermatitis began to bother her more, skin itching disturbed sleep. In menopause.

Objectively. When examining the skin, the skin is normal in color; the skin of the upper and lower extremities, the hairy part of the head has a rash, scratches, wounds, peeling skin. The tongue is wet, thickly coated with a white coating. The abdomen is soft, participates in breathing, painful on palpation in the epigastric region, right and left hypochondriums. The liver and spleen are not enlarged.

Laboratory parameters. Hematometry: hemoglobin 119 g/l, erythrocytes 4.3 T/l, leukocytes 6.6 g/l, platelets 288 g/l, ESR 21 mm/h. Biochemical blood analysis: total protein 60 g/l, total bilirubin 9.8 μmol/l, ALT 32 U/l, AST 26.4 U/l, alkaline phosphatase 119.2 U/l, GGT 90.0 U/l. Antimitochondrial antibodies are negative.

Ultrasound of abdominal organs: signs of indurative pancreatitis in the acute stage, pseudotumoral pancreatitis? Disease of the head of the pancreas? Dilatations of the duct of Wirsung, chronic cholecystitis.

Esophagogastroscopy: erythematous gastropathy (antral part). The urease test is negative.

Multispiral CT of the abdominal organs: signs of additional formation of the head of the pancreas, dilatation of the duct of Wirsung. Hepatomegaly. Right kidney cyst.

Colonoscopy (examination level of the terminal part of the ileum). Bauhin valve of lip-shaped form. The ileum mucosa is pink with affected lymphoid follicles. A sigmoid colon with sharp bends is determined. In the rectum, mucosa is focally hyperemic, 5–7 cm from the anus there are two areas of non-uniform color of the mucosa 15 × 7 mm and 10 × 5 mm, irregular in shape, with scarring changes, during instrumental palpation — dense consistency, easily injured, vascular pattern on the border area — changed, absent in the center, in the NBI mode the vascular pattern is unclear, irregular, neoplasia up to 5 mm in diameter (according to the JNET classification — I and IIA). A biopsy was taken.

Morphological examination: bowel adenocarcinoma.

The patient was discharged for further observation and treatment by oncologists.

When analyzing this clinical case, it should be noted that bowel cancer practically did not manifest itself with the corresponding symptoms: there was no blood in the stool, abdominal pain was of different localization, constipation was present for a long time. And the patient’s skin itching came to the fore, which could be disguised as neurodermatitis. However, laboratory signs of cholestasis (unexpressed), and ultrasound and tomographic data do not allow to exclude a tumor of the head of the pancreas. In fact, the detection of bowel adenocarcinoma in this case was the result of a further diagnostic search and the performance of a colonoscopy with a biopsy.

Clinical case 2

A 65-year-old patient consulted a doctor.

Complaints of constipation up to 6–7 days. There are no calls for an act of defecation. Defecation with pain, with effort, blood and mucus in the stool.

Anamnesis. He has been suffering from constipation for more than 25 years, he did not seek medical help because of shyness. He took laxative tea, senna on his own, but he began to notice that there was a need to increase the dose, so he took guttalex at once. In the last 6 months, there was pain after defecation and blood with mucus in the stool.

Objectively. On examination, the skin is pale, moist. The tongue is thickly coated with a white coating. The abdomen is soft, painful on palpation in the left iliac region. The liver and spleen are not enlarged. There are no symptoms of peri- toneal irritation.

Laboratory indicators. Hematology: anemia, ESR 12 mm/h. Biochemical blood analysis: total protein 72 g/l, total bilirubin 12.5 μmol/l, ALT 86 U/l, AST 58.6 U/l, alkaline phosphatase 74 U/l, GGT 119.0 U/l, total cholesterol 8.2 mmol/l, iron 8.7 mmol/l. Stool is positive for occult blood. The level of fecal calprotectin is within normal limits.

Ultrasound of the abdominal organs: signs of hepatomegaly, gallstone disease, diffuse changes in the pancreas.

Rigrography: signs of dolichosigmoid, colon neoplasm?

Colonoscopy (level of examination total examination of the large intestine). Bauhin valve of lip-shaped form. The ileum mucosa is dark, pigmented. In the sigmoid colon, at 34, 21, 18 cm, there are polyps on a thick stalk, the size of which is around 6.4, 5.0, 0.5 cm. The surface of the large polypt is not smooth, not uniform in color, with signs of bleeding. The mucosa 25–27 cm from the anus has an area of 34 × 52 mm with a dark red color, “juicer”, dense consistency, thickened in the lumen of bowel. A biopsy was taken. Polyps were removed endoscopically, the material was sent for examination.

Morphological examination: bowel adenocarcinoma.

The patient was referred to the oncology center.

When analyzing this clinical case, it should be noted that the patient had obvious symptoms of bowel cancer: blood in the stool with severe constipation that worsened, but the patient did not seek help for a long time. Worsening of the degree of constipation with the presence of blood in the stool is definitely a symptom of anxiety, which requires immediate instrumental examination (primarily, colonoscopy). Many colon polyps of various sizes in this patient is also noteworthy. Colon polyposis was probably the key cause of colon cancer. Therefore, in the presence of colon polyps in any patient, they are subject to removal with further observation.

Clinical case 3

A 32-year-old patient sought a consultation.

Complaints of abdominal pain, bloating, mucous bloody discharge from the vagina, diarrhea up to 3–4 times a day. Feces are unformed, without impurities of mucus and blood. The pain is pronounced, localized in both pubic parts and the...
suprapubic area. The pain does not depend on food, the act of defecation, but increases with body movements.

Anamnesis. Bowel movements 2–3 times a day for the past 3 years. Abdominal pain started around 5 days ago. The patient sought medical help from a gynecologist. On a transvaginal ultrasound, the doctor diagnosed a cyst of the right ovary measuring 9 × 6 cm. The prescribed treatment reduced the pain syndrome, on the control ultrasound, the cyst was drained on its own, but during the examination, the gynecologist saw a formation in the area of the small pelvis (Fig. 1).

The patient was referred to a gastroenterologist for consultation. The patient was hospitalized in the surgery department.

Objectively. During the examination, palpable tenderness in the right iliac region is noticed. The liver and spleen are not enlarged. There are no symptoms of peritoneal irritation.

Laboratory indicators. All indicators of general clinical examinations are normal. Stool for occult blood is negative. The level of fecal calprotectin is moderately elevated, more than 120 μg/g cal.

Hydrogen breath test. The patient underwent a hydrogen breath test with a glucose load to determine the state of the microbiota of the small intestine: the syndrome of excessive bacterial growth was not determined.

Ultrasound examination of the intestine: signs of insufficiency of the Bauhin valve, deformation of the colon, dolichosigmoid of the intestine, polyp of the sigmoid colon (an isoechoic formation with a diameter of 20 mm on a leg 14 mm long and 6 mm thick protrudes from the wall into the lumen, mobile according to the “candle flame” type) (Fig. 2).

Colonoscopy (level of examination total examination of the large intestine). Bauhin valve of lip-shaped form. The ileum mucosa is pink, clean. It is determined in the sigmoid colon, at 30 cm, a polyp on a thick leg, about 3 cm in size. Its surface is smooth, uniform in color. The polyp was removed endoscopically, the material was sent for examination.

Morphological examination: juvenile polyp of the large intestine, with minor signs of inflammation.

When analyzing this clinical case, it should be noted that, fortunately, a non-malignant polyp was found here. And he became an accidental find. Gynecological symptoms prevailed in the patient. And a gynecological examination made it possible to suspect intestinal pathology in the patient. A large polyp is dangerous in terms of malignancy. But, as known, polyps are often asymptomatic. Therefore, screening of CRC and precancerous conditions is an important task.

Discussion

Despite the constant development of diagnostic methods, the use of endoscopic studies in a narrow spectral mode, zoom endoscopy, autofluorescence, the problem of diagnosing intestinal neoplasms is still relevant. A non-specific clinical picture, masquerading as other diseases of the abdominal cavity, difficulties in visualization and obtaining informative biopsy material and differential diagnosis, the possibility of malignancy and the development of complications still remain problems in patients with this pathology [2].

Therefore, given the absence or non-specificity of symptoms in the early stages of CRC, screening for CRC plays an extremely important role. The very term “screening” implies a mass examination of asymptomatic persons with the aim of detecting a certain pathology. The most important task of CRC screening is the detection of adenomatous polyps for the purpose of their removal. Given that adenomatous polyps are one of the key causes of CRC, early detection and removal can prevent many cases of CRC. However, as you know, polyps are usually asymptomatic. Therefore, the questions of who should be screened and by what methods become very important.

Among the methods of screening for CRC, the first can be determined by stool analysis for occult blood. This method is simple and cheap. However, its sensitivity cannot be considered high. According to some data, the sensitivity of
fecal occult blood analysis is 50–60 % during a one-time study, but increases to 90 % if it is performed once every 1–2 years for a long period of time. Less accurate and convenient is the use of Weber’s guaiac test when performing a occult blood test. It requires the patient to follow a certain diet to prevent false-positive results of this test. It is more accurate to use an immunochemical analysis of feces for occult blood, which does not involve following such a diet before the test.

There are data that the use of fecal occult blood analysis for the purpose of screening in asymptomatic patients reduces mortality from colorectal cancer by 15–33 % in the general population [2, 5].

Another promising, but still not widely used screening method for CRC is stool DNA analysis. It is believed that the detection of altered DNA in stool samples can be a method of early detection of CRC [5].

Colonoscopy is the most accurate screening method for CRC, as it allows you to examine the entire large intestine, identify and remove intestinal polyps. According to the United States National Polyp Study, the detection and removal of intestinal polyps using screening colonoscopy can reduce the incidence of CRC by 90 %. Despite the fact that colonoscopy is the most difficult screening method for both the patient and the doctor, this method is considered by many specialists as the “gold standard” in the detection of CRC. It is clear that with positive results of other screening methods (for example, stool analysis for occult blood), a colonoscopy must be performed. But in some countries that have the appropriate economic resources, colonoscopy is considered as the first screening method for CRC [5].

Computed tomographic colonography (virtual colonoscopy) is a technique that includes a layer-by-layer computed tomographic scan of the intestine (after its thorough cleaning) followed by digital processing. This technique allows you to detect large polyps well, less accurately detects medium-sized polyps and does not allow you to detect flat formations. If polyps are detected, it is clear that it will be necessary to conduct a colonoscopic examination [5].

Double-contrast irriscopy is a technically quite simple procedure, but it can detect only large intestinal polyps. Its sensitivity is significantly inferior to colonoscopy, it does not sufficiently show the condition of the rectum [5].

Also, for the purpose of screening, a digital examination of the rectum can be carried out, which allows to suspect the presence of formations when they are localized only in the most distal parts of the rectum.

Thus, there are various methods of CRC screening, each with its own advantages and limitations. The choice of the CRC screening method for each specific patient depends on the clinical situation, as well as on the regulatory recommendations adopted in one or another country. For example, in Japan, the occult blood test as a screening is recommended to start at the age of 40 [6].

The ESMO regards endoscopic and non-invasive methods of screening for CRC. A total colonoscopy is recommended in patients with a medium and high risk of CRC, the optimal age for colonoscopy is 50–74 years, with subsequent repeated colonoscopy examinations every 10 years in the event that tumors or precancerous conditions are not detected. But when colonoscopy is refused, flexible sigmoidoscopy every 5–10 years and annual stool analysis for occult blood can be used as an alternative. Among the non-invasive screening methods, the use of a fecal immunochemical test for occult blood is recommended for people over 50 years of age. The optimal frequency is every year, but no later than once every 3 years. In the case of a positive occult blood test, a colonoscopy should be performed as soon as possible [7].

The CRC screening algorithm presented by the U.S. Multi-Society Task Force on Colorectal Cancer (2017) is very detailed. Screening tests are divided into 3 levels. The first-line tests are a colonoscopy every 10 years and an immunochemical fecal occult blood test every year. These two methods are considered key in screening. A sequential approach is proposed, in which a colonoscopy is performed first. A fecal test is offered to patients who refuse a colonoscopy. Second-tier tests (these are inferior to first-tier tests) include CT colonography every 5 years, FIT stool DNA test every 3 years, and flexible sigmoidoscopy every 5 to 10 years. The third level test (subsequent to the previous one) is a capsule colonoscopy every 5 years. Screening should begin at age 50 in individuals at medium risk (at age 45 in African Americans), but if blood in the stool is present in younger people, a thorough diagnostic examination should be performed. Persons who have reached the age of 75 and previously underwent screening, in the case of normal screening results (in particular, colonoscopy), further screening may not be continued. Individuals who have not been screened before should be considered for screening before age 85, depending on age and comorbidities. Individuals with a family history of CRC or progressive adenoma in a first-degree relative < 60 years of age or two first-degree relatives with these features at any age are recommended to undergo colonoscopy every 5 years starting 10 years prior to age at diagnosis the youngest affected relative or at age 40, whichever comes first. Individuals with one first-degree relative diagnosed with CRC or advanced adenoma at age ≥ 60 years may be offered intermediate-risk screening options starting at age 40 years [8].

Today, optical colonoscopy is the most accurate method of diagnosing colon pathology [8, 9]. The sensitivity of which is estimated as 95 % or more, but requires sedation [10]. A great advantage of colonoscopy is also the possibility of polyp removal. In these clinical cases, only colonoscopy determined further treatment tactics and clearly defined the diagnosis of the patients. Alternative non-invasive methods include CT colonography and MR tomography [11].

When interpreting a CT scan, diagnostics of formations less than 5 mm in size, and flat formations is not accurate enough. In a study by Ibanez et al. in 217 patients with colon cancer, preoperative CT colonography detected all tumors with exact localization in 208 cases (92.4 %), differentiated T3/T4 tumors from T1/T2 — 81.1 %. For high-risk tumors (T3 ≥ 5 mm and T4), accuracy was 82.7 %, sensitivity was 86 %, and specificity was 80 % [12].
The success of MR colonography is related to the development and improvement of technique, the study has the ability to identify polyps 10 mm and larger, and provides greater contrast between soft tissues than CT.

CT and MRI techniques have similar disadvantages. Colon cancer can be indistinguishable from ovarian metastases or a small benign tumor. MRI signs of a colon tumor are nonspecific and can be a manifestation of any disease that has led to thickening of the colon wall (Crohn’s disease, diverticulitis, tuberculous and ischemic colitis).

Transrectal ultrasound examination of bowel will help in diagnosing the depth of the tumor, perirectal spread. The accuracy of diagnosing the stage of a tumor with transrectal ultrasound is 84.6 versus 70.5 % with CT.

Conclusions

The given clinical examples show that there are no specific complaints and a clear clinical picture of intestinal tumor lesions. Symptoms are variable. Only a directed diagnostic search allows you to clearly verify the disease. A clear, step-by-step diagnostic algorithm will help doctors of all branches of health care to diagnose patients in a timely manner (Fig. 3).

All data obtained in evidence-based studies confirm the need for screening examinations of patients with the aim of timely detection of malignant neoplasms of the large intestine. Given the lack of specific clinical symptoms, one should not focus only on patient complaints and the clinical picture, but should pay attention to “red flag symptoms”, such as unmotivated weight loss, lack of appetite, anemia, presence of blood in bowel movements.

It is necessary to note the need for the screening of fecal occult blood for all patients after the age of 50, and if the fecal test is positive, colonoscopy with sedation. Optical colonoscopy is the most accurate method of diagnosis, with other methods are compared; in clinical cases when the previous diagnostic search led the doctor in the wrong direction, only colonoscopy and biopsy put “all the dots”. If there are contraindications or the impossibility of performing a colonoscopy, it is possible to use non-invasive methods: CT, MRI, transrectal ultrasound of bowel.

Thus, CRC is an actual problem of modern medicine. An important task of the doctor is to carry out preventive measures, as well as high-quality screening of CRC and pre-cancerous changes of bowel.

References


Сучасні позиції щодо діагностики та скринінгу колоректального раку й передракових змін кишечника.

Резюме. Стаття присвячена проблемі колоректального раку та передракових змін кишечника. Відображено фактори ризику, клінічні симптоми, методи діагностики, напрямки профілактики колоректального раку й передраку. Наведені та проаналізовані з клінічні випадки в пацієнтів із пухлинами кишечника і передпухлинними станами. Особливий акцент у статті зроблено на необхідності своєчасного виявлення пухлин та проведенні скринінгу колоректального раку. Показані варіанти скринінгу, проаналізований кожний із його методів. Наведені алгоритми скринінгу за даними практичних керівництв різних країн. Наголошено на актуальності та важливості проблеми колоректального раку й передракових змін.

Ключові слова: колоректальний рак; передракові зміни кишечника; фактори ризику; діагностика; скринінг; профілактика