

Review Article

Synthetic analysis of the pathologies of the digestive system

Abstract: The main purpose of this article is to provide a detailed and concise explanation of the most common pathologies of the digestive system. This is composed of the digestive tract, liver, pancreas and gallbladder. Its main function is to carry out the digestion of food, to transform it into nutrients that the body uses as energy for its integral functioning, growth and cellular repair. The digestive system may present some diseases and disorders, both acute (short term) and chronic (long term). Among the latter, stomach and colorectal cancer represent a major public health problem.

Key words: Acute digestive diseases, chronic digestive diseases.

Introduction.

After food is chewed and swallowed, it travels down the esophagus, (a tube-like organ that carries food through the neck and chest into the stomach). The esophagus joins the stomach

at the gastroesophageal junction, which is just below the diaphragm (the thin layer of breathing muscle below the lungs). The stomach is a sac-like organ containing food that allows partial digestion through the secretion of gastric juice. Food and gastric juice are mixed and then emptied into the first section of the small intestine.¹

The small intestine is actually the longest section of the digestive tract, it is approximately 6 meters long. It consists of 3 portions, the first and closest to the stomach called the duodenum, where bile is secreted, jejunum and ileum. It is in this part where most of the nutrients are absorbed.

The waste passes into the colon (large intestine), a muscular duct about 2 meters long. This is responsible for absorbing water and nutrients from food and also functions as a storage place for feces. Waste is moved from the colon to the rectum, which is the last six inches of the digestive tract.

The rectum is the place where excrement leaves the body through the opening that forms the anus.²

Gastritis

It is defined as microscopic inflammation of the gastric mucosa.³

The current classification of gastritis focuses on its time course (acute or chronic), histologic features, anatomic distribution and underlying pathologic mechanisms. Acute gastritis will progress to chronic gastritis if left untreated.⁴

The most common cause is *Helicobacter pylori* (*H. pylori*)⁴, followed by atrophic gastritis and the third cause is the intake of acetylsalicylic acid and other NSAIDs.³

When inflammation becomes continuous it leads to the gradual loss of gastrin-producing G cells and acid-producing parietal cells, causing a decrease in acid secretion and thus the development of intestinal atrophy and metaplasia.

The diagnosis is made by one or more tests ranging from 3 non-invasive tests for *H. pylori*, serology, detection of antigens in stool and the C-labeled breath test, endoscopies can also be performed to observe the characteristics of the epithelium, as well as biopsies which is essential for diagnosis because different types of gastric cancers have their origin in some gastritis.^{3,30}

Constipation

It is a bowel habit disorder subjectively defined as a decrease in the frequency of bowel movements with stools that are too hard or difficult to pass. Bowel manifestations are often associated with abdominal discomfort or pain.

In practice, the most objective criterion used is the frequency of bowel movements, with the individual being considered constipated if he/she has less than three bowel movements per week.

However, this criterion is not sufficient by itself, since many patients with constipation report a normal frequency but with other subjective complaints, such as excessive straining, very hard stools or a sensation of incomplete evacuation.⁵

It can have different causes, ranging from changes in diet, physical activity or lifestyle, to more complex causes such as primary motor dysfunctions produced by myopathy or colonic neuropathy. Constipation can also be secondary to a bowel movement disorder: dehydration, lack of fiber in the diet, physical inactivity or side effects of medications.

One way to diagnose is by a test to check how sensitive the rectum is, how well it functions, and how well the anal sphincters work. Balloon expulsion test - a test that involves pushing a small water-filled balloon from the rectum to see if there is a problem with pushing stool out.

During the exam you can also check for dehydration, listen for abdominal sounds, examine the abdomen for: swelling, pain or tenderness, masses or lumps, do a rectal exam.⁶

For treatment, drinking more fluids, eating more fiber-rich foods, and exercising regularly may relieve constipation. Using stool softeners and laxatives may also be helpful although it is not the most advisable in the long term.

Warning symptoms where the patient should consult a physician.

1. He has intense and constant abdominal pain and swelling.
2. Difficulty to defecate.
3. Defecates less than three times per week.
4. He suffers from constant difficulty to defecate.
5. He suffers from bleeding from the rectum.

Acute pancreatitis (AP)

It is a common disease in which acute inflammation of the pancreas occurs, which may cease at this point and be followed by repair and scarring phenomena or, less frequently, by a systemic inflammatory response that may result in the involvement of other systems (circulatory, respiratory or renal excretory) leading to the development of organ failure (FO) and even death of the patient.⁷

Repeated episodes of acute pancreatitis may lead to chronic pancreatitis.

Treatment

For the treatment of acute pancreatitis, the GAC guidelines do not recommend the use of prophylactic antibiotics; however, the AGA guidelines recommend it when necrosis is

greater than 30% of the pancreas. If infection is suspected, antibiotics can be started and a fine needle puncture of the pancreatic necrosis is performed for bacteriological culture; blood cultures, urine culture and secretion cultures as the case may be and if the cultures are negative antibiotics should be suspended, if they are positive they are maintained for 14 days.^{8,9,10}

Endoscopic necrosectomy is part of the medical treatment. The clear indication to perform it is the presence of infection (evidenced by the presence of gas in the tomography or by the presence of germs in the Gram or culture) in the necrosis, in the context of a clinical picture of poor evolution. Although more studies are still needed to define the role of endoscopic necrosectomy, percutaneous management vs. surgical necrosectomy, which is currently the standard management.¹¹

Regarding nutrition in acute pancreatitis, the early use of enteral nutrition is performed in the patient who is predicted to have an evolution to severity or prolonged disease and it is considered better not to give nutritional supplementation because enteral nutrition has less risk of infections when compared to parenteral nutrition. It should be taken into account that the form of refeeding in mild acute pancreatitis one of them is the early use of enteral nutrition in the patient who is predicted to have an evolution to severity or prolonged disease.¹² The use of both enteral and parenteral nutrition in patients with acute pancreatitis is better than not giving nutritional supplementation. Likewise, enteral nutrition has less risk of infections when compared to parenteral nutrition.¹³

On the other hand, the form of refeeding in mild acute pancreatitis was initially with clear liquids and if there was tolerance, the patient would gradually move to solid diets, but it has been shown that giving solid diet at the beginning could be a safe method of refeeding and provide a greater number of calories. Another way to start with low-fat solid diets is once the ileus has resolved and the patient is free of pain and nausea.¹³

Diagnosis

In order to diagnose acute pancreatitis, 2 of these 3 conditions must be present: severe abdominal pain of sudden onset localized in the epigastrium and often radiating to the back; amylase (or lipase) in the blood 3 times the normal value; and/or findings characteristic of acute pancreatitis on imaging tests, usually CT scan or less commonly, but also correctly, MRI or transabdominal ultrasound.¹⁴

Cancer

It is caused when cells somewhere in the body begin to grow in an uncontrolled manner.

Instead of dying, cancer cells continue to grow and form more cancer cells, which can grow into other tissues (invade). They can also migrate to other tissues, organs and systems (metastasis).

In most cases, cancer cells form a tumor. However, some types of cancer (such as leukemia) do not form tumors, but settle in the blood and bone marrow.²

There are factors associated with cancer, among them some agents that can be classified into chemical agents, radiant energy and microorganisms.³⁰

In most cases, diagnosis requires that physicians perform biopsies (tissue samples) to diagnose cancer. It must then be analyzed by a pathologist to see if the tissue has characteristics consistent with cancer. The pathologist describes the findings in a report, which contains the details of the finding and allows a decision to be made between treatment options.^{15,30}

Colorectal cancer

As the name implies, it is cancer that originates in the colon or rectum. Both colon cancer and rectal cancer share many characteristics in common.

The symptoms of **colorectal cancer** depend mostly on the size and location of the cancer. Some of the most common symptoms are changes in bowel habits, changes in stool consistency, melena (black stool from digestion of blood) or hematochezia (the presence of blood in the stool) and abdominal discomfort or pain.^{2,16,30}

Gastric cancer

Also popularly known as stomach cancer. It is that adenocarcinoma restricted to the mucosa or mucosa and submucosa.

Some of the factors associated with the development of gastric cancer are the presence of *Helicobacter pylori* infection, family history of *Helicobacter pylori*, smoking and dietary factors.^{16,30}

The histological types of gastric adenocarcinoma based on Lauren's classification are intestinal, diffuse and mixed forms. The intestinal type is the most frequent in areas of high incidence and in older individuals, while the diffuse type occurs in areas of low incidence and in younger individuals.^{16,30}

It is estimated that between 15 and 57% of cases of gastric adenocarcinoma can be detected at an early or incipient stage. In Mexico, there are no statistics or early detection programs that allow us to establish the incidence.¹⁷

Mexico is considered a country with an intermediate incidence (between 10 and 20 cases per 100,000 inhabitants).¹⁸

Symptoms and symptoms: abdominal pain, vague discomfort in the abdomen, usually just above the navel. Feeling of fullness or fullness in the upper abdomen after eating a light meal, frequent heartburn or constant indigestion. Nausea, nausea, melena, vomiting of blood, fatigue, loss of appetite, weight loss.

The use of chromo endoscopy, magnification and light-enhanced equipment is recommended for diagnosis, as well as histopathological diagnosis, which sets the guidelines for treatment.¹⁵

Celiac disease (CD)

The term celiac originates from the Greek word koiliakos (koelia = abdomen), since one of the main symptoms of celiac disease in childhood is abdominal distension.

It consists of an intolerance to gluten proteins (gliadins, secalins, hordeins and possibly avenins) that triggers an inflammatory process at the intestinal level, leading to microvilli degradation and reduced absorption of nutrients contained in food and severe atrophy of the mucosa of the upper small intestine if not treated in a timely manner.

This results in a negative defect in the utilization of nutrients (immediate principles, salts and vitamins) at the level of the digestive tract, whose clinical and functional repercussions will depend on the age and pathophysiological situation of the patient.¹⁹

Diagnosis is based on the finding of severe intestinal atrophy in a 1st intestinal biopsy (gluten diet), histological normalization proven in a 2nd intestinal biopsy, after a period of 2 years of gluten-free diet, and reappearance of the villous lesion proven by a 3rd intestinal biopsy after reintroduction of gluten in the diet (provocation test).^{19, 31}

The clinical features of CD differ considerably according to age. Intestinal symptoms and growth retardation are common in children diagnosed within the first years of life. The development of the disease later in childhood is marked by the appearance of extraintestinal symptoms.

Cholecystitis

It is the inflammation of the gallbladder caused mainly by gallstones (lithos) and less frequently by biliary mud (sludge), in rare occasions none of these conditions is present. Approximately 95% of these occur as a result of gallstones.^{15, 20}

Despite being a frequent pathology in emergency units, its diagnosis can be a challenge. Currently, diagnostic and severity criteria are being developed for this disease, among which the diagnostic criteria of the Tokyo Guidelines stand out.²¹

Cholelithiasis

It is defined as the presence of lithos (stones) in the gallbladder.¹³

It is estimated that 10-20% of Americans have gallstones, and up to one third of these people will develop acute cholecystitis. About 25% of patients with cholelithiasis have secondary complications, including cholecystitis (also pancreatitis, choledocholithiasis and others), and an estimated 20% of symptomatic gallstones (biliary colic) progress to cholecystitis.

In developed countries, the prevalence of gallstones is estimated at 5 to 10% in the adult population. It should be noted that the most affected ethnic groups correspond to Latinos with indigenous ancestry, among which the Mapuche ethnic group in Chile stands out. On the other hand, African and Asian populations have lower prevalences.²²

The most common treatment is cholecystectomy for recurrent cholecystitis or colic performed by general surgeons, resulting in approximately 500,000 operations per year.

Cholelithiasis, the main risk factor for developing cholecystitis, has a higher prevalence among people of Scandinavian origin, Pima Indians and the Hispanic population, while cholelithiasis is less common among people from sub-Saharan Africa and Asia.²⁰

A significant proportion of patients with surgical pathology of the biliary tract and pancreas suffer from malnutrition.⁶

Risk factors:

Cholecystitis and Cholelithiasis: have the following risk factors in common.

- More frequent after 40 years of age
- Female sex.
- Pregnancy, especially for the development of cholesterol stones, usually asymptomatic forms of biliary lithiasis and both biliary mud and stones smaller than 10mm, which usually disappear after delivery.
- Use of oral contraceptives and hormone replacement therapy with estrogens receiving a dose greater than 50 micrograms.
- Use of drugs such as fibrates and ceftriaxone.²²

Irritable Bowel Syndrome (IBS)

It is characterized by the presence of recurrent gastrointestinal symptoms such as abdominal pain and distension together with alterations in the stool habit, in the absence of metabolic or structural disorders that justify the symptoms.²³

The cause of irritable bowel syndrome (IBS) is unknown. No anatomical cause can be found on laboratory tests, x-rays or biopsies. Emotional factors, diet, drugs or hormones may precipitate or aggravate digestive symptoms.

Treatment

An essential part of treatment is the patient-physician relationship, which includes avoiding patient bias, practical and cost-effective clinical assessment, genuine concern for symptoms, education and involving the subject in the decisions to be made. The European guidelines mention 10 points necessary to meet patients' expectations.²⁴

1. A clear and concise description of the disease.
2. To inform that there is no magic cure.
3. Clear explanation regarding the patient's self-management of his or her disease.
4. Make it clear that there may be good days and bad days, but that there is light at the end of the road.
5. Offer different treatment options.
6. Recognize that IBS is a disease.
7. Discuss alternative treatments.
8. Offer complementary treatments.
9. Provide understanding and comprehension.
10. Be aware of the emotional conflicts of the newly diagnosed patient.²⁴

According to the nutritional treatment it is common to find that patients report intolerance to some foods, almost always those with high fat content, spicy or with dairy products. The recommendation is to identify which foods may contribute to the symptoms, as well as to review the fiber content in the diet and decrease or increase it according to the symptoms and the amount ingested. Based on the history, diets eliminating dairy products, wheat or gas-producing foods can be tried, which can benefit up to 50% of the patients.²⁵

Diagnosis

For diagnosis, multiple symptom-based criteria have been described and are presented in Table 1. The first to be used were the Manning criteria, published in 1976 with a positive predictive value not exceeding 75%, with a sensitivity of 78% and a specificity of 72%.²⁶ Whereas, in 1998, the XIII International Congress of Gastroenterology developed the Rome I criteria, which were modified in 1999 (Rome II) and 2006 (Rome III), the Rome II criteria being easier to remember and apply, but differing from the Rome I criteria in that they are more restrictive and have lower sensitivity (49% vs. 83%, $p \leq 0.001$).²⁷

Table 1. Diagnostic criteria for irritable bowel syndrome.^{26,27}

Manning criteria <ol style="list-style-type: none">1. Abdominal pain that is relieved by evacuation2. More frequent bowel movements at the onset of pain3. Diarrheal stools at onset of pain4. Visible abdominal distension5. Mucus in the stool6. Sensation of incomplete evacuation
Rome III criteria <p>Abdominal pain or unpleasant sensation that occurs at least 3 times a month in the previous three months, accompanied by two or more of the following:</p> <ol style="list-style-type: none">1. Improvement of pain with defecation-At the onset of pain it is related to a change in the frequency of bowel movements2. At the beginning of the pain, it is associated with a change in the consistency of the bowel movements3. Symptoms must begin at least six months prior to diagnosis

Inflammatory bowel disease (IBD)

It represents a group of idiopathic chronic inflammatory bowel conditions. The two main nosological categories covered by the term are Crohn's disease (CD) and ulcerative colitis (UC); both have overlapping clinicopathological features as well as others that allow clear differentiation.

The pathogenesis of IBD is not fully understood. Genetic and environmental factors, such as modification of luminal bacteria and increased intestinal permeability, play an important role in the misregulation of intestinal immunity, leading to gastrointestinal injury.²⁸

Chronic Pancreatitis

It is a long-lasting inflammatory process of unpredictable rhythm, leading to the development of fibrosis and loss of exocrine and endocrine parenchyma.

The most frequent cause of chronic pancreatitis is chronic abuse of alcoholic beverages. It can trigger pancreatitis in some patients even at mild or moderate doses depending on genetic predisposition, nutritional habit and other factors. Sometimes the cause is unknown or is caused by gallstones.

The diagnosis of chronic pancreatitis can be difficult because amylase and lipase levels are usually normal as a result of significant loss of pancreatic function. Diagnosis is based on clinical evaluation, imaging studies and pancreatic function tests.²⁹

Morphological alteration of the pancreas, demonstrated by endoscopic study of the pancreatic duct, scanner or echoendoscopy.

Impairment of pancreatic function demonstrated by special pancreatic function tests

Laboratory tests to help diagnose pancreatitis include:

1. Blood tests.
2. Stool analysis.
3. Ultrasound.
4. Computed tomography. .
5. Endoscopic ultrasound link. .
6. Pancreatic function test.

If it persists, the patient should seek immediate medical attention.²⁹

- Severe or worsening pain or tenderness in the abdomen.
- Nausea and vomiting.
- Fever or chills.
- Rapid heartbeat.
- Difficulty breathing.
- Yellowish color of the skin or whites of the eyes, known as jaundice²⁹

Conclusions

The pathologies of the digestive tract are derived from hereditary factors, that is, risk factors, but have their origin in the triggering of symptoms derived from lifestyles, among which highlights the eating or nutritional habits, social determinants that favor inadequate nutrition, resulting in acute digestive tract diseases that can trigger chronic, so the doctor should always refer the patient to a nutritionist.

This in turn should be trained in the field of healthy eating, considering the social environment to use food resources according to the social context and needs of people.

Among the pathologies of the digestive system are the major causes of neoplasms, diseases such as stomach and colorectal cancer represent a real public health problem, due to the high costs they represent for the health system and the loss of quality of life of the patients who suffer from them.

Other diseases such as acute pancreatitis, celiac disease, constipation should not be left aside since, as we could observe, the presence of some of these could have as a serious consequence the appearance of cancer.

Conflict of interest. The authors declare that there is no conflict of interest for the publication of this article.

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