GASTROINTESTINAL DISEASES

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PEPTIC ULCER

Ulceration in the inner lining of the stomach or upper part of the small intestine is called peptic ulcer. The sore is a result of inflammation caused by the bacteria H. pylori or due to erosion from acids present in the stomach. Stomach pain is the most common symptom experienced by people suffering from peptic ulcer amongst others like bleeding, bloating, and rarely perforation.

Peptic ulcer disease (PUD) is characterized by discontinuation in the inner lining of the gastrointestinal (GI) tract because of gastric acid secretion or pepsin. It extends into the muscularis propria layer of the gastric epithelium. It usually occurs in the stomach and proximal duodenum. It may involve the lower esophagus, distal duodenum, or jejunum. Epigastric pain usually occurs within 15-30 minutes following a meal in patients with a gastric ulcer; on the other hand, the pain with a duodenal ulcer tends to occur 2-3 hours after a meal. Today, testing for Helicobacter pylori is recommended in all patients with peptic ulcer disease. Endoscopy may be required in some patients to confirm the diagnosis, especially in those patients with sinister symptoms. Today, most patients can be managed with a proton pump inhibitor (PPI) based triple-drug therapy.

Peptic ulcers are generally classified into two types:

Gastric ulcers – Ulcers present inside the stomach.

Duodenal ulcers – Ulcers that develop in the duodenum, that is the upper part of the small intestine.

Peptic ulcers are open sores that can be found in the:

Stomach lining

First part of the small intestine (the duodenum)

These painful sores develop when the acidic digestive fluids in the stomach eat away the protective lining of the organs, thus forming ulcers.

Left untreated, peptic ulcers can lead to serious complications including bleeding in the stomach and perforation (tear) of the stomach wall.

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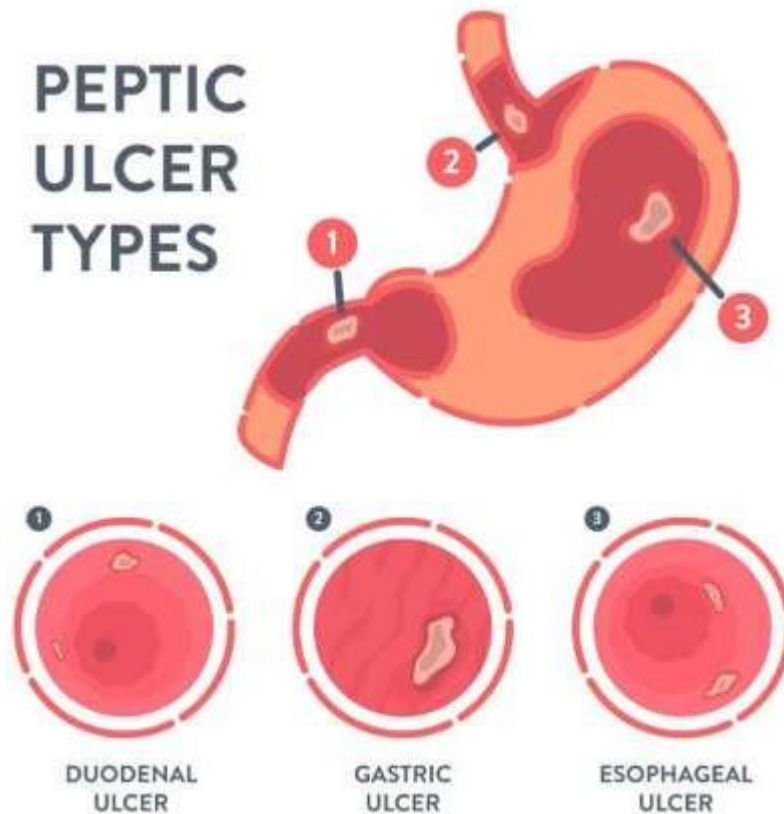
CAUSES

Normally, the digestive tract is covered with a protective mucous layer, that prevents the stomach acid from destroying the inner stomach lining. Conditions that cause an increase in the stomach acids and decreases the amount of mucus results in inflammation in the stomach. The excess acid destroys the mucus layer and eats away the stomach lining.

The common causes are as follows:

Helicobacter pylori (H. pylori) infection – More than half of the population has H. pylori living in the mucous layer of the stomach. It is harmless in most people, but in a few individuals, it increases the stomach acids causing inflammation and ulcer formation. The exact mode of transmission is still not known, but it is believed to spread through direct contact and contaminated food and water.

Indiscriminate use of painkillers – Frequent use of analgesics of the nonsteroidal anti-inflammatory drug (NSAIDs) group like Aspirin, Ibuprofen, Naproxen, and Ketoprofen can irritate or inflame the lining of the stomach.

Other Causes: Smoking, consuming too much alcohol, radiation therapy, too much stress, eating spicy food, family history of peptic ulcer, and stomach cancer can increase the risk of developing a peptic ulcer.

Some rare causes of peptic ulcers are:

Ulcer may develop after being very ill due to any infection or disease.

Due to medications such as steroids.

Ulcer may develop after surgery.

Ulcers can also develop due to Zollinger-Ellison syndrome which causes the formation of acid-producing cell tumors in the digestive tract. They cause severe damage to the stomach tissues, and these tumors can be cancerous or non-cancerous.

SYMPTOMS

Burning type of abdominal pain is the most common symptom of peptic ulcers. This pain radiates from the navel to the chest and varies from being mild to severe. Small ulcers do not produce any pain in the initial stages. The symptoms include:

Feeling bloated.

Belchings.

Heartburn.

Nausea.

Vomiting.

Stools become black and tarry because of the presence of blood in them.

Loss of appetite.

Unexplained weight loss.

Chest pain.

Indigestion.

COMPLICATIONS

It is essential to detect and treat ulcers as soon as possible because untreated ulcers can cause serious health complications like:

Bleeding from the ulcers can cause anemia and other emergency conditions. Blood transfusion might be required if there is a severe loss of blood. Signs of bleeding include blood in vomit, black stools, light headedness, and dizziness.

Sometimes, peptic ulcer can perforate the wall of the stomach. This puts you at risk of serious infections.

The scar tissue formation over an ulcer can obstruct the passage of food through the digestive tract.

All the above conditions are serious, so seek medical attention if you experience any of the following symptoms:

Sharp and sudden abdominal pain.

Fainting.

Profuse sweating.

Confusion.

Rigid abdomen.

RISK FACTORS

People with the following adverse habits are at risk of developing peptic ulcers.

Indiscriminate use of NSAIDs (painkillers).

Smoking.

Alcoholism.

Untreated stress.

Eating a lot of spicy food.

DIAGNOSIS

If the person experiences any of the above symptoms, they should consult a doctor. The doctor will ask about the symptoms and history, and if the doctor suspects a peptic ulcer, the person will have to undergo the following tests:

Upper GI (Gastrointestinal) Endoscopy – This test is not done for all suspected cases of ulcers but is done for people with a higher risk of stomach cancer, bleeding or symptoms not responding to usual medications. Here, the doctor inserts a long tube with a camera attached on one side (endoscope) through your mouth and throat, into the stomach. This will help the doctor

to see the stomach and small intestine lining, and to visualize the ulcer. They can also collect tissue samples for testing.

Upper GI Series – Upper GI radiography is a real-time fluoroscopy technique that involves taking series of X-rays of the esophagus, stomach, and small intestine after the patient drinks a thick liquid called barium (barium swallow). This liquid coats the digestive tract, making the ulcer more visible.

Tests for Helicobacter pylori – The presence of H.pylori bacteria is tested in the biopsies from stomach (taken during endoscopy), blood, stool, or breath. Endoscopic biopsies are the gold standard for detection of H.pylori in stomach tissue. The breath test is the most accurate of them all. In the breath test, the patient is asked to drink or eat something that contains radioactive carbon. H.pylori breaks down the radioactive carbon that is released as carbon dioxide, the presence of which is tested in the breath.

TREATMENT

The treatment depends on the cause. The following treatments are used:

Medications:

Antibiotics are given to kill H.pyori in the stomach. The combination of antibiotics includes Amoxicillin, Clarithromycin, Metronidazole, Tinidazole, Tetracycline, and Levofloxacin.

Proton pump inhibitors (PPIs) are used to reduce the acid production in the stomach. Examples of PPIs are Omeprazole, Rabeprazole, Pantoprazole, Lansoprazole, and Esomeprazole.

Histamine (H2) blockers are used to block the cells that produce acids in the stomach. These medicines include Ranitidine, Famotidine, Cimetidine, and Nizatidine.

Antacids help in neutralizing the stomach acid and help in relieving the pain.

In a few cases, cytoprotective agents are given to protect the tissues in the lining of the stomach. Sucralfate and Misoprostol are the examples.

Home Remedies

Consume a diet rich in vitamins, minerals, and proteins. Eat fruits, vegetables, and whole grains.

PREVENTION

A few alterations in your lifestyle and habits can reduce the risk of you developing peptic ulcers. The lifestyle changes and habits include:

Reduce the consumption of alcoholic beverages.

Do not consume alcohol when on any medication.

Wash your hands frequently to avoid infections.

Limit the use of painkillers.

For many people treatments aim to target the underlying cause which helps in curing the ulcer disease. Ulcers can reoccur if the underlying cause is not completely cured or the person continues to smoke or use NSAIDs (nonsteroidal anti-inflammatory drugs).

CONSTIPATION

Constipation is a condition in which a person has uncomfortable or infrequent bowel movements. Generally, a person is considered to be constipated when bowel movements result in passage of small amounts of hard, dry stool, usually fewer than three times a week. However, normal stool elimination may consist of having a bowel movement three times a day or three times a week; it depends on the person.

About 4 million people in the United States have frequent constipation. Constipation is the most common gastrointestinal complaint, resulting in 2.5 million doctor visits annually.

CAUSES

Hard, dry stools are the result of the colon absorbing too much water. Normally, as food moves through the colon (also known as the large intestine) the colon absorbs water while forming stool (waste products). Muscle contractions then push the stool toward the rectum, and, by the time the stool reaches the rectum, most of the water has been absorbed, making the stool solid.

When the colon's muscle contractions are slow or sluggish, the stool moves through the colon too slowly, resulting in too much water being absorbed. Some of the most common causes of constipation include the following:

Medications

Lack of exercise

Not enough liquids

Not enough fibre in the diet

Irritable bowel syndrome

Ignoring the urge to have a bowel movement

Changes in habits or lifestyle, such as travel, pregnancy, and old age

Problems with intestinal function

Abuse of laxatives

SYMPTOMS

The following are the most common symptoms of constipation. However, each individual may experience symptoms differently. Symptoms may include:

Difficult and painful bowel movements

Bowel movements fewer than three times a week

Feeling bloated or uncomfortable

Feeling sluggish

Abdominal pain

The symptoms of constipation may resemble other medical conditions or problems. Always consult your doctor for a diagnosis.

DIAGNOSIS

The tests performed by a doctor will depend on the duration and severity of the constipation, since most persons experience constipation at one time or another. The doctor will also take into

account the patient's age, and whether there is blood in the stool, recent changes in bowel habits, or weight loss.

Diagnosing constipation may include:

Medical history. The doctor will ask for a description of the constipation, including duration of symptoms, frequency of bowel movements, and other information to help determine the cause of the constipation.

Physical examination. A physical examination may also include a digital rectal examination (DRE), in which the doctor inserts a gloved, lubricated finger into the rectum to evaluate the tone of the muscle that closes off the anus. This examination also helps detect tenderness, obstruction, blood, amount and caliber of stool, and if enlargement of the rectum is present.

Other diagnostic tests may include:

Abdominal X-ray

Lower GI (gastrointestinal) series (also called barium enema). A lower GI series is a procedure that examines the rectum, the large intestine, and the lower part of the small intestine. A fluid called barium (a metallic, chemical, chalky, liquid used to coat the inside of organs so that they will show up on an X-ray) is given into the rectum as an enema. An X-ray of the abdomen shows strictures (narrowed areas), obstructions (blockages), and other problems.

Colonoscopy. Colonoscopy is a procedure that allows the doctor to view the entire length of the large intestine, and can often help identify abnormal growths, inflamed tissue, ulcers, and bleeding. It involves inserting a colonoscope, a long, flexible, lighted tube, in through the rectum up into the colon. The colonoscope allows the doctor to see the lining of the colon, remove tissue for further examination, and possibly treat some problems that are discovered.

Sigmoidoscopy. A sigmoidoscopy is a diagnostic procedure that allows the doctor to examine the inside of a portion of the large intestine, and is helpful in identifying the causes of diarrhea, abdominal pain, constipation, abnormal growths, and bleeding. A short, flexible, lighted tube,

called a sigmoidoscope, is inserted into the intestine through the rectum. The scope blows air into the intestine to inflate it and make viewing the inside easier.

Colorectal transit study. This test shows how well food moves through the colon. The patient swallows' capsules containing small markers which are visible on X-ray. The patient follows a high-fiber diet during the course of the test, and the movement of the markers through the colon is monitored with abdominal X-rays taken several times three to seven days after the capsule is swallowed.

Anorectal function tests. These tests diagnose constipation caused by an abnormal functioning of the anus or rectum.

TREATMENT

Specific treatment for constipation will be determined by your doctor based on:

Your age, overall health, and medical history

Extent of the condition

Your tolerance for specific medications, procedures, or therapies

Expectations for the course of this condition

Your opinion or preference

Most often, constipation can be treated through dietary and lifestyle changes, which relieve symptoms and help prevent the condition.

 Treatment may include:

Diet modifications. A diet with 20 to 35 grams of fiber daily helps in the formation of soft, bulky stool. While adding foods such as beans, whole grains, bran cereals, fresh fruits and vegetables is helpful in adding fiber to the diet. Limiting foods such as ice cream, cheeses, meats, and processed foods, which contain little or no fiber can also be helpful.

Laxatives. Laxatives may be prescribed after diet and lifestyle changes have failed to be effective.

Eliminating or changing medication

Biofeedback. Biofeedback is used to treat chronic constipation caused by anorectal dysfunction. This treatment retrains the muscles that control release of bowel movements.

Lifestyle changes, such as increased water and juice intake, regular exercise, and allowing enough time for daily bowel movements can be helpful.

Complications

Constipation can cause complications, such as hemorrhoids, which occur by straining to have a bowel movement, or anal fissures (tears in the skin around the anus) which occur when hard stool stretches the sphincter muscle. This can result in rectal bleeding.

Sometimes, straining also causes rectal prolapse, where a small amount of intestinal lining pushes out from the anal opening. Constipation may also cause fecal impaction, which occurs mostly in children and older adults. The hard stool packs the intestine and rectum so tightly that the normal pushing action of the colon is not enough to expel the stool.

DIARRHEA

Diarrhea is a common condition that varies in severity and etiology. The evaluation of diarrhea varies depending on duration, severity, and presence of certain concurrent symptoms. Treatment also varies, though rehydration therapy is an important aspect of the management of any patient with diarrhea. This activity reviews the evaluation and treatment of diarrhea and stresses the role of the interprofessional team in caring for patients with this condition.

Acute diarrhea is described as the acute onset of three or more loose or watery stools a day lasting for 14 days or less. However, chronic or persistent diarrhea is labelled when an episode lasts beyond 14 days. Infection commonly causes acute diarrhea. Non-infectious etiologies become more common as the duration of diarrhea becomes chronic. This distinction is important because treatment and management are based on the duration and specific etiology. Rehydration therapy is an important aspect of the management of any patient with diarrhea.

ETIOLOGY

Diarrhea is categorized into acute or chronic and infectious or non-infectious based on the duration and type of symptoms. Acute diarrhea is defined as an episode lasting less than two weeks. Infection most commonly causes acute diarrhea. Most cases are the result of a viral infection, and the course is self-limited. Chronic diarrhea is defined as a duration lasting longer than two weeks and tends to be non-infectious. Common causes include malabsorption, inflammatory bowel disease, and medication side effects. Following are some important considerations to be made while diagnosing and managing diarrhea as the identification of the etiological agent is very important:

Stool characteristics vary between different causes, such as consistency, color, volume, and frequency

Presence or absence of associated intestinal symptoms, such as nausea/vomiting, fever, and abdominal pain

Exposure to child daycare where commonly encountered pathogens are rotavirus, astrovirus, calicivirus; Shigella, Campylobacter, Giardia, and Cryptosporidium species

History of the ingestion of infected food, such as raw or contaminated foods

History of water exposure from swimming pools, camping, or marine environment

Travel history is crucial as common pathogens affect certain regions; enterotoxigenic Escherichia coli is the predominant pathogen

Animal exposure has been historically linked with diarrhea, such as young dogs/cats: Campylobacter; turtles: Salmonella

Predisposing factors such as hospitalization, antibiotic use, immunosuppression

EPIDEMIOLOGY

Norovirus is associated with approximately one-fifth of all infectious diarrhea cases, with similar prevalence in both children and adults, and is estimated to cause over 200,000 deaths annually in developing countries. Historically, rotavirus was the most common cause of severe disease in

young children globally. Rotavirus vaccination programs have decreased the prevalence of diarrhea cases associated with rotavirus.

In developing regions, an average of three episodes of diarrhea per child per year is reported in children less than 5 years old. However, certain other areas report six to eight episodes per year per child. In these circumstances, malnutrition plays an additional role in the development of diarrhea.

A common cause of chronic diarrhea includes inflammatory bowel disease, Crohn disease, and ulcerative colitis. In Europe, the incidence of ulcerative colitis and Crohn disease has increased overall from 6.0 per 100,000 person-years in ulcerative colitis and 1.0 per 100,000 person-years in Crohn disease in 1962 to 9.8 per 100,000 person-years and 6.3 per 100,000 person-years in 2010, respectively.

A study conducted by Lübbert et al observed the occurrence of Clostridium difficile related infection in Germany to be 83 cases/100,000 population in 2012. The chance of recurrence escalated with each relapse in these cases.

In the United States, before specific antirotavirus immunization was introduced in 2006 a cumulative occurrence of one hospitalization for the cases of diarrhea per 23-27 children by the age of 5 years was noted. Moreover, over 50,000 hospitalizations were noted. Basing it on these facts, rotavirus was found to be responsible for 4-5% of all childhood hospitalizations costing nearly 1 billion US dollars.

SYMPTOMS

The main symptom of diarrhea is passing loose, watery stools three or more times a day.

People with diarrhea may also have one or more of the following symptoms:

An urgent need to use the bathroom

Cramping

Loss of control of bowel movements

Nausea

Pain in the abdomen

People with diarrhea caused by some infections may also have one or more of the following symptoms:

Bloody stools

Fever and chills

Light-headedness and dizziness

Vomiting

Diarrhea may cause dehydration and malabsorption.

PATHOPHYSIOLOGY

Diarrhea is the result of reduced water absorption by the bowel or increased water secretion. A majority of acute diarrheal cases are due to infectious etiology. Chronic diarrhea is commonly categorized into three groups; watery, fatty (malabsorption), or infectious. Another way of classifying the pathophysiology of diarrhea is into secretory and osmotic forms of diarrhea.

Lactose intolerance is a type of watery diarrhea that causes increased water secretion into the intestinal lumen.Patients typically have symptoms of bloating and flatulence along with watery diarrhea. Lactose is broken down in the intestine by the enzyme lactase. The byproducts are readily absorbed by the epithelial cells. When lactase is decreased or absent, lactose cannot be absorbed, and it remains in the gut lumen. Lactose is osmotically-active, and it retains and attracts water leading to watery diarrhea.

Common causes of fatty diarrhea include celiac disease and chronic pancreatitis. The pancreas releases enzymes that are necessary for the breakdown of food. Enzymes are released from the pancreas and aid in the digestion of fats, carbohydrates, and proteins. Once broken down, the products are available for uptake in the gut. Patients with chronic pancreatitis have insufficient enzyme release leading to malabsorption. Symptoms often include upper abdominal pain, flatulence, and foul-smelling, bulky pale stools due to malabsorption of fats.

In the secretory form of diarrhea, bacterial and viral infections are the common causes. In this instance, the watery stool is the result of injury to the gut epithelium. Epithelial cells line the intestinal tract and facilitate the absorption of water, electrolytes, and other solutes. Infectious etiologies cause damage to the epithelial cells which leads to increased intestinal permeability. The damaged epithelial cells are unable to absorb water from the intestinal lumen leading to loose stool.

COMPLICATIONS

Diarrhea can lead to several complications, some of which can be serious if not addressed promptly. Key complications include:

Dehydration: The most common and potentially serious complication, dehydration occurs when the body loses more fluids and electrolytes than it takes in. Symptoms include dry mouth, excessive thirst, reduced urine output, and dizziness.

Electrolyte Imbalance: Along with water, diarrhea causes loss of essential electrolytes like sodium, potassium, and chloride, which are crucial for normal body functions. Imbalances can lead to symptoms such as muscle cramps, fatigue, and in severe cases, heart problems.

Malnutrition: Chronic diarrhea can lead to poor absorption of nutrients, causing malnutrition. This can be particularly concerning in children, affecting their growth and development.

Weight Loss: Persistent diarrhea can result in significant weight loss due to the loss of fluids, electrolytes, and nutrients.

Skin Irritation: Frequent bowel movements can cause irritation and rashes around the anal area.

Secondary Infections: Continuous diarrhea can damage the intestinal lining, making it more susceptible to infections.

Impact on Quality of Life: Chronic diarrhea can significantly impact daily activities and overall quality of life due to discomfort, urgency, and potential embarrassment.

Acidosis: Severe dehydration and electrolyte imbalance can lead to metabolic acidosis, where the body produces too much acid or when the kidneys are not removing enough acid from the body.

TREATMENT/MANAGEMENT

Important aspect of diarrhea management is replenishing fluid and electrolyte loss. Patients should be encouraged to drink diluted fruit juice, Pedialyte or Gatorade. In more severe cases of diarrhea, IV fluid rehydration may become necessary. Eating foods that are lower in fiber may aid in making stool firmer. A bland 'BRAT' diet including bananas, toast, oatmeal, white rice, applesauce and soup/broth is well tolerated and may improve symptoms. Anti-diarrheal therapy with anti-secretory or anti-motility agents may be started to reduce the frequency of stools. However, they should be avoided in adults with bloody diarrhea or high fever because they can worsen severe intestinal infections. Empiric antibiotic therapy with an oral fluoroquinolone can be considered in patients with more severe symptoms. Probiotic supplementation has been shown to reduce the severity and duration of symptoms and should be encouraged in patients with acute diarrhea.

The treatment of chronic diarrhea is specific to the etiology. The first step is to categorize diarrhea into watery, fatty or inflammatory. Once categorized, an algorithm can be used to determine the next step in management. Most cases require additional fecal studies, lab work or imaging. More invasive procedures like colonoscopy or upper endoscopy may be required.

In 2003 the recommendations were put forward by the Center for Disease Control (CDC) for the treatment of acute diarrhea in children on both the outpatient and inpatient basis including indications for referral.

Indications for referral and further medical evaluation of children include the following:

Under 3 months old

Weighs less than 8 kg (17.6 lbs)

History of premature birth, chronic illnesses, or concurrent medical conditions

Fever of 38ºC (100.4 F) or higher in children less than 3 months old or 39ºC (102.2 F) or higher in children between 3 and 36 months of age

Grossly bloody stool

High-output diarrhea

Persistent vomiting

Signs of dehydration, such as sunken eyes, decreased tear film, dry mucous membranes, and oliguria/anuria

Mental status alterations

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