JCARR
JOURNAL OF CLINICAL ADVANCES AND RESEARCH REVIEWS

Available online on http://www.jcarr.in/
Journal of Clinical Advances and Research Reviews 2024; 01(01); 74-84

Review Article

Navigating Gastrointestinal Challenges: Unveiling Effective Approaches to Disease Management and Medicinal Solutions

Nikita Patil, Akash Yadav*, Dinesh Kumar Jain

IPS Academy College of Pharmacy, Knowledge Village, Rajendra Nagar, A.B. Road, Indore-452012

Received: 20-02-2024 / Revised: 29-02-2024 / Accepted: 12-03-2024
Corresponding Author: Dr. Akash Yadav
Email: akashyadav@ipsacademy.org
Conflict of interest: Nil

Abstract:

This abstract provides a comprehensive overview of common gastrointestinal diseases, encompassing diagnostic approaches and treatment modalities. The diagnostic spectrum involves a triad of lab tests, imaging studies, and endoscopic procedures tailored to each ailment. Lab tests encompass Fecal occult blood test and Stool culture, while imaging tests incorporate advanced technologies like Magnetic resonance imaging (MRI) and CT scans. Endoscopic procedures, such as Colonoscopy and Esophagogastroduodenoscopy, play a pivotal role in visualizing and diagnosing gastrointestinal conditions. Treatment strategies emphasize a holistic approach, incorporating balanced diets, adequate hydration, and stress management. Regular check-ups are pivotal for monitoring disease progression and adjusting treatment plans accordingly. Lifestyle modifications, such as avoiding tobacco and excessive alcohol consumption, are integral components of disease management. This abstract underscore the multifaceted nature of gastrointestinal diseases, advocating a comprehensive strategy for diagnosis and management.

Keywords: *Constipation, Gastrointestinal disease, Heartburn, Irritable bowel syndrome, Ulcer*

Introduction:

A 2023 study discovered that one in three people globally suffers from digestive issues, leading to an estimated 33 million deaths in 2019. Examining 18 digestive diseases across over 200 countries, the research highlighted the widespread impact on the gastrointestinal system, crucial for nutrient absorption and waste elimination. The findings underscore the substantial global health challenge posed by these conditions, emphasizing the need for awareness, early detection, and effective management to alleviate the burden on individuals and healthcare systems worldwide.[1]

Gastrointestinal (GI) disease refers to a group of disorders that affect the digestive system, which plays a crucial role in the breakdown and absorption of food, as well as the elimination of waste from the body. The GI tract includes organs such as the esophagus, stomach, small intestine, large intestine (colon), liver, gallbladder, and pancreas. Any malfunction or abnormality in these organs can lead to various gastrointestinal conditions. [2]

Inflammatory conditions, including inflammatory bowel disease, such as Crohn's disease and ulcerative colitis, are common in gastrointestinal diseases. These chronic diseases are characterized by inflammation in the gastrointestinal tract, which leads to symptoms like abdomen pain, diarrhoea and weight loss. Conversely, functional disorders like irritable bowel syndrome (IBS) manifest with abdominal discomfort, bloating, and altered bowel habits, without evidence of inflammation.

Infections are also a major contributor to Gastrointestinal Diseases, which can be seen in the example of gastroenteritis. This inflammation of the stomach and intestines may be caused by viruses, bacteria or parasites which can produce symptoms such as nausea, vomiting, diarrhoea. Gastrointestinal cancers, such as colorectal cancer, represent a serious health concern. Colorectal cancer often develops from precancerous polyps, emphasizing the importance of regular screenings for early detection.

Diagnosis of gastrointestinal diseases involves a combination of medical history assessments, physical examinations, imaging studies, and sometimes endoscopic procedures. The treatment approach can include medicines, lifestyle modifications, dietary changes or surgical interventions depending on the specific nature of the disease.

Understanding and treating Gastrointestinal Diseases are essential for the promotion of general health and prevention of complications given their effect on wellbeing. In order to improve outcomes for people affected by these conditions, early detection and appropriate interventions are crucial. [3,4]

Common Gastrointestinal Diseases:

Several common gastrointestinal diseases affect the digestive system, impacting various organs and functions. Here are some notable GI Diseases:

Heartburn:

Heartburn is an uncomfortable burning sensation in the chest, situated behind the breast bone, triggered by a regurgitation of stomach acid to the gastrointestinal tract. Frequently associated with gastroesophageal reflux disease (GERD), it adversely impacts the quality of life for millions. It is caused by factors such as certain foods, obesity, and pregnancy. The management of heartburn requires lifestyle changes such as diet modification, avoidance of triggers and the use of medicines like antacids or proton pumps inhibitors. The need for medical intervention may arise in cases of chronic illness. Despite its prevalence, understanding and addressing heartburn plays a critical role in reducing the impact on day-to-day life and promoting total wellbeing of those suffering from it. [5,6]

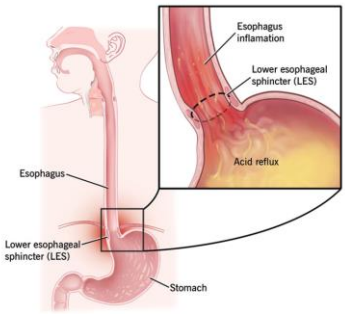

Fig. 1: Heartburn

Constipation:

Constipation is a common digestive condition characterized by infrequent bowel movements, difficulty in passing stools, or the passage of hard and dry stools. It can be associated with various factors, including a low-fiber diet, inadequate fluid intake, lack of physical activity, certain medications, and underlying medical conditions. Constipation can lead to discomfort, bloating, and abdominal pain. The normal frequency of bowel movements can vary among individuals, but generally, having fewer than three bowel movements per week is considered indicative of constipation. Persistent or severe constipation may require medical attention, and treatment often involves lifestyle changes, dietary adjustments, and, in some cases, medications. [7]

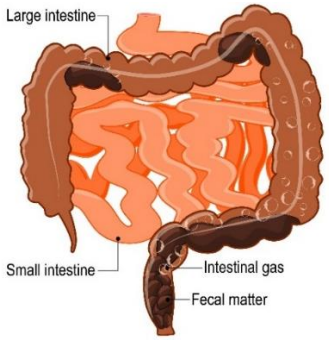

Fig. 2: Constipation

Celiac disease:

Celiac disease is caused by an autoimmune response to gluten, a protein found in wheat, barley and rye. It triggers an immune response that damages the villi of the small intestine and prevents nutrient absorption when eaten.

Symptoms differ, but are frequently caused by diarrhea, bloating, fatigue and weight loss affecting approximately 1 in 141 persons. It may lead to malnutrition and other health problems that are not detected.

A strict gluten free diet, which requires vigilance to avoid any sources of gluten, is the only treatment. While there's no cure, adhering to this diet effectively manages symptoms and prevents complications, allowing individuals with celiac disease to live healthy lives. [8,9]

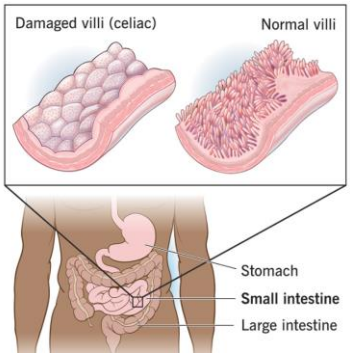

Fig. 3: Celiac disease

Irritable bowel syndrome (IBS):

IBS is a chronic gut disorder causing recurring abdominal pain, bloating, and irregular bowel movements (diarrhea, constipation, or both). While not life-threatening, it significantly impacts quality of life. The exact cause remains unknown, but stress, diet, and gut-brain connection are thought to play a role. Treatment focuses on managing symptoms through dietary changes, stress reduction, and sometimes medication. While incurable, IBS can be effectively managed, allowing individuals to find relief and live fulfilling lives. [10,11]

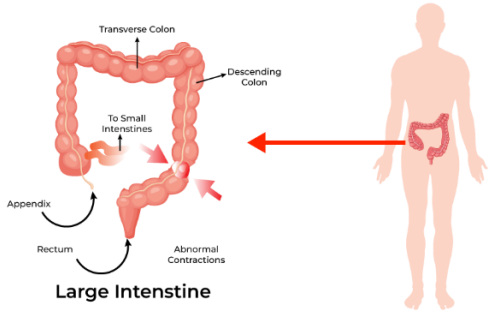

Fig. 4: Irritable bowel syndrome

Diarrhoea:

Diarrhoea, characterised by frequent and loose fluid stools, disturbs the digestive tract. An imbalance in the movement of fluids through the intestines can be caused by a variety of causes, such as infections, food intolerances or medication. This leads to uncomfortable symptoms like abdominal cramps, nausea, and dehydration. While most cases are resolved in a few days, it is important to seek medical attention for severe or prolonged diarrhoea so that the underlying cause can be identified and avoided complications. In order to prevent and manage diarrhoea, it is important that you continue to maintain good hygiene and hydration. [12,13]

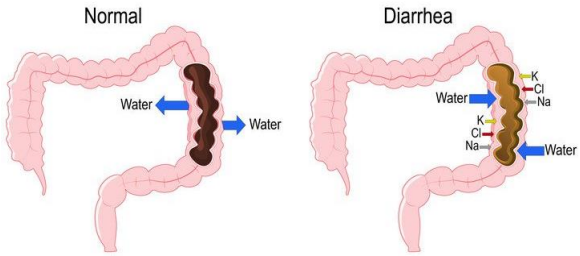

Fig. 5: Diarrhoea

Haemorrhoids:

Haemorrhoids are swollen veins in the rectum and anus. They are very common, affecting as many as 50% of adults at some point in their life. There are two main types of haemorrhoids:

1. **Internal haemorrhoids:** Internal haemorrhoids are swollen veins located inside the rectum, the last part of your large intestine where stool is stored before being passed. Unlike external haemorrhoids, which form under the skin around the anus, internal haemorrhoids are typically not visible from the outside.
2. **External haemorrhoids:** External haemorrhoids are swollen veins near the anus, causing pain, itching, and bleeding. The risk increases due to strain, constipation and low fiber levels. It can be helped by Sitz baths, stool softeners, and creams. If symptoms get worse, see a doctor. [14,15]

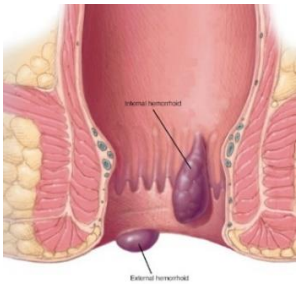

Fig. 6: Haemorrhoids

Ulcerative colitis:

Ulcerative colitis, a chronic gastrointestinal disease, inflames the inner lining of the colon, causing ulcers and discomfort. Frequent bloody diarrhoea, abdominal pain, and urgency to empty bowels are common symptoms. While the exact cause remains unknown, genetics and immune system dysfunction are believed to play a role. Treatment focuses on managing symptoms and preventing flare-ups with medications, dietary adjustments, and in severe cases, surgery. While incurable, individuals with UC can lead fulfilling lives with proper management and support. [16,17]

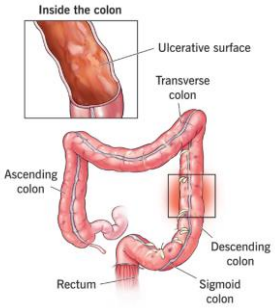

Fig. 7: Ulcerative colitis

Diverticulitis:

Diverticulitis is caused by inflammation and infection of pouches in the colon. Due to pressure in the colon these pouches, known as diverticula, form. Symptoms include severe lower left abdominal pain, fever, nausea, and bowel changes. Age, low-fiber diet, and smoking increase the risk. Resting the colon, antibiotics and pain medication are used for treatment. It is possible to prevent recurrence by lifestyle changes such as increasing fibre intake and maintaining hydration. If you experience any of the symptoms, talk to your doctor. [18,19]

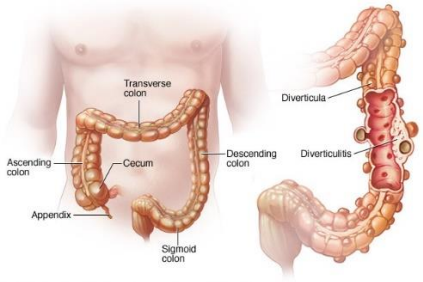

Fig. 8: Diverticulitis

Gallstones:

Gallstones are hard deposits that form in the gallbladder, a small organ located near the liver. These stones are made up of cholesterol, bilirubin, or a combination of both. While some individuals may not experience any symptoms with gallstones, they can cause significant discomfort and complications if left untreated.

Formation and Risk Factors:

The formation of the gallstone is due to a number of factors, which include:

1. Hepatic cholesterol levels are higher in bile.
2. Excess bilirubin in bile.
3. Slowing down the flow of bile. [20,21]

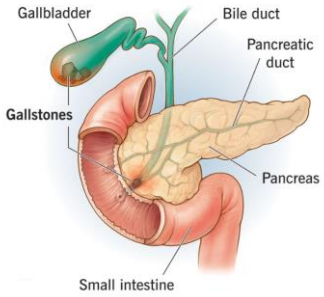

Fig. 9: Gallstones

Pancreatitis:

Pancreatitis is an inflammatory condition in which the pancreas, a gland located behind the stomach responsible for producing digestive enzymes and insulin, becomes inflamed. These enzymes may start to digest the pancreas itself when the pancreas becomes inflamed, leading to significant pain and possible complications.

Types of Pancreatitis:

There are two main types of pancreatitis:

1. **Acute pancreatitis:** This is a sudden and serious inflammation that can be resolved with appropriate therapy in several days.
2. **Chronic pancreatitis:** This is a long, recurrent inflammation that can cause permanent damage to the pancreas and interfere with its function. [22,23]

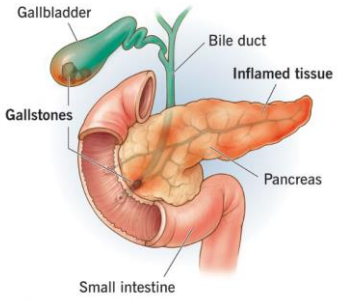

Fig. 10: Pancreatitis

Vomiting:

Vomiting, the forceful expulsion of stomach contents, isn't a disease itself but a symptom of various conditions. It can be due to gastrointestinal problems such as food poisoning or ulcers, undigested causes like movement disorders and medication. It's often uncomfortable, but it may be a way to rid the body of dangerous chemicals. If you experience vomiting, consult a healthcare professional to identify the cause and seek proper treatment. [24,25]

Peptic ulcers:

Peptic ulcers are open sores that form on the lining of the stomach, upper small intestine, or esophagus. Helicobacter pylori infection and prolonged use of nonsteroidal anti-inflammatory drugs (NSAIDs) often contribute to their development. Symptoms include abdominal pain, bloating, nausea, and heartburn. Endoscopy and H. pylori testing are part of the diagnosis. Treatment combines antibiotics to eradicate the bacteria, acid-reducing medications, and sometimes medications to promote ulcer healing. There is also a role to be played by lifestyle changes such as avoiding certain foods and coping with stress. Left untreated, peptic ulcers may lead to complications such as bleeding, perforation, or obstruction, necessitating prompt medical attention.

Classification:

A peptic ulcer may arise at various locations:

1. Stomach (called gastric ulcer)
2. Duodenum (called duodenal ulcer)
3. Oesophagus (called oesophageal ulcer) [26,27]

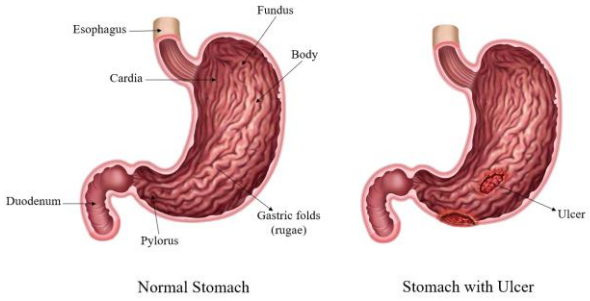

Fig. 11: Peptic ulcer

Malabsorption:

Malabsorption is a condition in which the digestive system does not adequately absorb nutrients from food. Causes include disorders like celiac disease, chronic pancreatitis, and inflammatory bowel disease. The symptoms include weight loss, diarrhoea, bloat, and nutritional deficiencies. Malabsorption is due to conditions that affect the small intestine or inhibit enzyme production. In order to control symptoms and enhance absorption of nutrients, treatment should address the underlying cause, dietary changes or occasionally supplements. For the correct diagnosis and management, it is essential to seek medical care. [28]

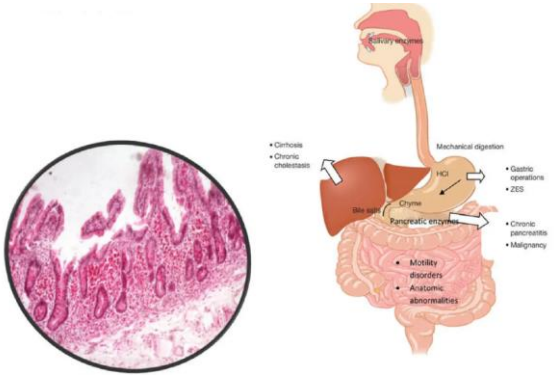

Fig. 12: Malabsorption

Anorectal abscess:

Anorectal abscess is a painful collection of pus near the anus or rectum, often caused by infected anal glands. Bleeding pain, redness, swelling and fever are the most common symptoms. The treatment consists of lancing and drainage, antibiotics and sitz baths. To avoid complications such as fistulae, abnormal connection or recurrence, consult a doctor immediately for diagnosis and treatment. [29]

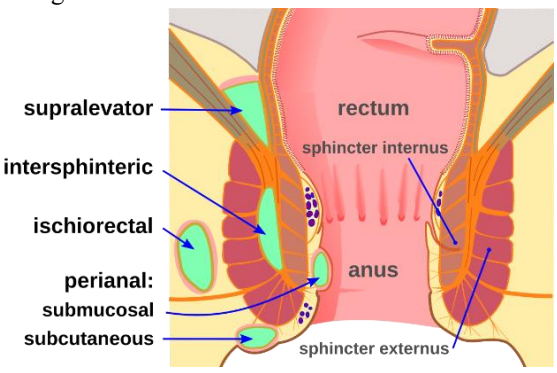

Fig. 13: Anorectal abscess

Bowel incontinence:

Bowel incontinence, or fecal incontinence, involves the inability to control bowel movements, leading to unintentional leakage of stool. Muscle or nerve damage, diarrhea and other diseases such as irritable bowel syndrome are causes. It can affect people of any age, but older adults are more likely to have it. Treatment options for improving bowel control and enhancing quality of life include lifestyle changes such as medication or surgery. [30]

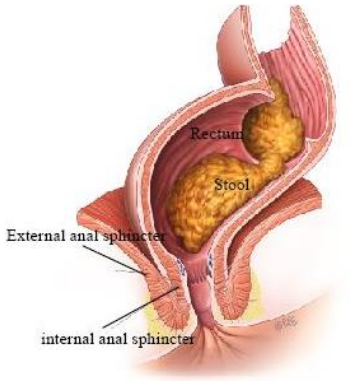

Fig. 14: Bowel incontinence

Colon polyps:

The polyps in the colon or rectum are growths that occur within the internal lining of the colon. They're very common in people over 50 years of age. Most colon polyps are benign neoplasms, and some may be carcinogenic over time. Different types of colon polyps are present, and two main categories include Adenomatous or Hyperplastic Colorectal Pleats.

1. **Adenomatous Polyps:** These are considered precancerous and have the potential to develop into colorectal cancer over time. The size and type of adenomaous polyp are generally linked to the risk of malignancy.
2. **Hyperplastic Polyps:** It is normally harmless and has a low risk of developing cancer. On the other side of the colon, it is more common. [31,32]

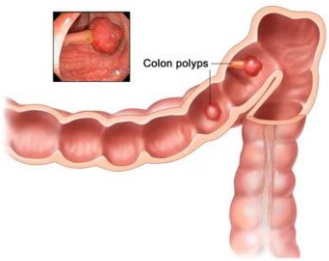

Fig. 15: Colon polyps

Inflammatory bowel disease:

Inflammatory bowel disease IBD is a chronic disease characterized by inflammation of the digestive tract. The most common types are Crohn's disease and ulcerative colitis. Abdominal pain, diarrhea, weight loss and tiredness are symptoms. It is not known exactly why, but it involves a complex interplay of genetic, environmental, and immune factors. There are medicines, lifestyle changes and occasionally surgery involved in treatment. The aim of treatment is to control inflammation, reduce symptoms and improve quality of life, requiring ongoing medical supervision. [33]

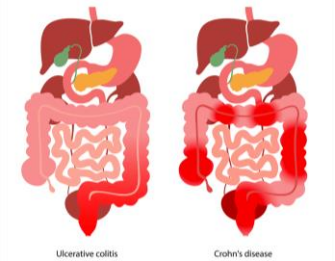

Fig. 16: Inflammatory bowel disease

Bowel obstruction:

Bowel obstruction is a blockage of the normal flow of digestive contents from the stomach to the intestines. Causes such as adhesions, hernias, tumours or inflammation can lead to this. Symptoms may include abdominal pain, tension, vomiting, and changes in bowel habits. Diagnosis involves imaging studies, and treatment may include decompression, intravenous fluids, or surgery. Prompt medical attention is crucial to prevent complications like ischemia or perforation. [34]

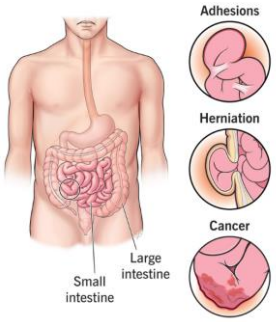

Fig. 17: Bowel obstruction

Abdominal adhesions:

Abdominal adhesions, often caused by surgery, inflammation or injury, are fibrous bands of scar tissue that form between abdominal tissues and organs. Such adhesions can cause organs or tissues to stick together, leading to complications such as pain, obstruction of the bowel and fertility problems. They are usually seen after abdominal surgery, but they may also occur spontaneously. Treatment options include surgery to remove the adhesions, but this may carry the risk of further adhesion formation. [35]

Fig. 18: Abdominal adhesions

Diagnostic Approaches: [36,37]

A combination of clinical evaluation, imaging studies, endoscopic procedures and laboratory tests is part of the diagnostic approach for GI disorders. Specific symptoms, suspected conditions and the need for detailed information about the gastrointestinal tract are factors that determine which diagnostic methods to use. In assessing gastrointestinal diseases, here are a number of commonly accepted diagnosis approaches:

Lab Tests	
Fecal occult blood test	A fecal occult blood test checks for hidden (occult) blood in the stool. It's a very small amount of stool that you place on the special card. The stool shall be tested in the doctor's office or sent to a laboratory for testing.
Stool culture	Stool cultures are used to check for the presence of abnormal bacteria in the gastrointestinal tract that may cause diarrhoea and other health problems. A small sample of stool is collected and sent to a lab by your healthcare provider's office. The test will indicate whether abnormal bacteria are present within 2 to 3 days.
Imaging tests	
Magnetic resonance imaging (MRI)	MRI is a non-invasive diagnostic test utilizing magnets, radiofrequencies, and a computer to create detailed body images. Patients, lying on a moving bed, experience no pain or radiation exposure.
Barium beefsteak meal	The barium meal test allows Xray observation of stomach digestion because the patient swallows a food containing barium. The test checks for digestive function and identifies problems of emptying that may not be observed in traditional barium trials.
Computed Tomography (CT)	This is an imaging test that involves X rays and a computer to produce high resolution photographs of your body. Details of bones, muscles, fat, and

	organs are presented in a CT scan. A CT scan is more detailed than a general Xray.
Ultrasound	Using high frequency sound waves and a computer to generate an image of internal structures, ultrasound is a diagnostic method. The gel is put on the body, and a transducer produces waves that move back to create images in your monitor. In order to be reviewed in the future, it assesses organ function and blood flow by recording images.
Endoscopic procedures	
Colonoscopy	Colonoscopy is a procedure to examine the whole colon by means of an elastic tube, which may be called a colonoscopy. It helps detect abnormalities such as growths or bleeding and allows tissue to be removed for examination and possible treatment by inserting into the rectum.
Esophagogastroduodenoscopy	EGD, or upper endoscopy, is a procedure using an endoscope to examine the esophagus, stomach, and duodenum. Through the mouth, the endoscope aids in viewing, and if needed, allows biopsy sample collection.

Preventing Gastrointestinal Disease:

The adoption of a healthy lifestyle and the introduction of preventive measures are essential to prevent gastrointestinal diseases. Key strategies include:

- **Balanced diet:** A balanced diet consisting of fiber, fruit, vegetables and grains is recommended. Limit the intake of processed foods, sugary drinks and excessive fats.
- **Hydration:** Drink enough water throughout the day to keep your body adequately hydrated.
- **Stress Management:** Use relaxation techniques, exercise and maintaining a healthy balance between work and life to manage stress.
- **Regular Check-ups:** Attend routine health check-ups and screenings to detect and address potential issues early.
- **Avoiding Tobacco and Excessive Alcohol:** Quit smoking and limit alcohol intake, as these habits can contribute to gastrointestinal issues. [38]

Conclusion:

In conclusion, gastrointestinal diseases encompass a spectrum of disorders affecting the digestive system, with notable examples including gastroesophageal reflux disease (GERD), irritable bowel syndrome (IBS), inflammatory bowel disease (IBD), and peptic ulcers. Treatment strategies vary depending on the specific condition but often involve a combination of lifestyle modifications, dietary changes, and medication. GERD may be managed with proton pump inhibitors to reduce stomach acid, while dietary modifications and medications targeting symptoms are commonly employed for IBS. Inflammatory bowel diseases like Crohn's and ulcerative colitis may necessitate immunosuppressive drugs to manage inflammation. Peptic ulcers often require antibiotics to eradicate Helicobacter pylori infection, along with proton pump inhibitors to reduce gastric acid production. Overall, a comprehensive approach involving medical management and lifestyle adjustments is crucial for effectively addressing gastrointestinal diseases and improving patients' quality of life.

Acknowledgement: We would like to express our sincere gratitude to IPS Academy College of Pharmacy, Indore for providing access to resources and facilities that facilitated our above article.

Conflict of interest: The authors declare there is no any conflict of interest in this study.

References:

1. Wang R, Li Z, Liu S, Zhang D. Global, regional, and national burden of 10 digestive diseases in 204 countries and territories from 1990 to 2019. Frontiers in Public Health. 2023; 11:1061453.
2. Ogobuiro I, Gonzales J, Tuma F. Physiology, gastrointestinal. StatPearls Publishing. 2022:1-9
3. Mayer EA. The neurobiology of stress and gastrointestinal disease. Gut. 2000:861-9.
4. Fikree A, Byrne P. Management of functional gastrointestinal disorders. Clinical Medicine. 2021:44-48.
5. Mandel, Daggy, Brodie, Jacoby. alginate-raft formulations in the treatment of heartburn and acid reflux. Alimentary Pharmacology & Therapeutics. 2000:669-90.

6. Musale P, Mankar SD. A review on polyherbal formulation used in the treatment of gastric acidity. Research Journal of Pharmacognosy and Phytochemistry. 2023:173-8.
7. Camilleri M, Ford AC, Mawe GM, Dinning PG, Rao SS, Chey WD, Simrén M, Lembo A, Young-Fadok TM, Chang L. Chronic constipation. Nature reviews Disease Primers. 2017:1-9.
8. Kagnoff MF. Celiac disease: pathogenesis of a model immunogenetic disease. The Journal of Clinical Investigation. 2007:41-9.
9. Green PH, Cellier C. Celiac disease. New england journal of medicine. 2007:1731-43.
10. Akehurst R, Kaltenthaler E. Treatment of irritable bowel syndrome: a Review of Randomised Controlled Trials. Gut. 2001:272-82.
11. El-Serag HB, Olden K, Bjorkman D. Health-related quality of life among persons with irritable bowel syndrome: a systematic review. Alimentary Pharmacology & Therapeutics. 2002:1171-85.
12. Schiller LR, Pardi DS, Sellin JH. Chronic diarrhea: diagnosis and management. Clinical Gastroenterology and Hepatology. 2017:182-93.
13. Giuseppe C, Silvi S, Verdenelli MC, Coman MA. Treatment of acute diarrhoea: past and now. International Journal of Enteric Pathognes. 2015:8-19.
14. Kaidar-Person O, Person B, Wexner SD. Hemorrhoidal disease: a comprehensive review. Journal of the American College of Surgeons. 2007:102-17.
15. Stratta E, Gallo G, Trompetto M. Conservative treatment of hemorrhoidal disease. Reviews on Recent Clinical Trials. 2021:87-90.
16. Gros B, Kaplan GG. Ulcerative colitis in adults: A review. Jama. 2023:951-65.
17. Feuerstein JD, Cheifetz AS. Ulcerative colitis: epidemiology, diagnosis, and management. InMayo Clinic Proceedings 2014:1553-1563.
18. Strate LL, Morris AM. Epidemiology, pathophysiology, and treatment of diverticulitis. Gastroenterology. 2019:1282-98.
19. Gregersen R, Mortensen LQ, Burcharth J, Pommergaard HC, Rosenberg J. Treatment of patients with acute colonic diverticulitis complicated by abscess formation: a systematic review. International Journal of Surgery. 2016:201-8.
20. Njeze GE. Gallstones. Nigerian Journal of surgery. 2013:49-55.
21. BElloWS CF, BErGEr DH, Crass RA. Management of gallstones. American Family Physician. 2005:637-42.
22. Zheng Z, Ding YX, Qu YX, Cao F, Li F. A narrative review of acute pancreatitis and its diagnosis, pathogenetic mechanism, and management. Annals of Translational Medicine. 2021:1-8.
23. Szatmary P, Grammatikopoulos T, Cai W, Huang W, Mukherjee R, Halloran C, Beyer G, Sutton R. Acute pancreatitis: Diagnosis and Treatment. Drugs. 2022:1251-76.
24. https://kidshealth.org/en/parents/vomit.html#:~:text=What%20Is%20Vomiting%3F,gets%20better%20on%20its%20own/ Accessedon 24/02/2024.
25. Lee LY, Abbott L, Mahlangu B, Moodie SJ, Anderson S. The management of cyclic vomiting syndrome: a systematic review. European Journal of Gastroenterology & Hepatology. 2012:1001-6.
26. Zhang W, Lian Y, Li Q, Sun L, Chen R, Lai X, Lai Z, Yuan E, Sun S. Preventative and therapeutic potential of flavonoids in peptic ulcers. Molecules. 2020:1-31.
27. Kuna L, Jakab J, Smolic R, Raguz-Lucic N, Vcev A, Smolic M. Peptic ulcer disease: a brief review of conventional therapy and herbal treatment options. Journal of Clinical Medicine. 2019:1-19.
28. Ensari A. The malabsorption syndrome and its causes and consequences. Pathobiology of Human Disease. 2014:1266-72.
29. Hyman N. Anorectal abscess and fistula. Primary Care: Clinics in Office Practice. 1999:69-80.
30. Ruiz NS, Kaiser AM. Fecal Incontinence-Challenges and solutions. World Journal of Gastroenterology. 2017:11-17.
31. Bond JH. Colon polyps and cancer. Endoscopy. 2003:27-35.
32. Shussman N, Wexner SD. Colorectal polyps and polyposis syndromes. Gastroenterology report. 2014:1-5.
33. Guan Q. A comprehensive review and update on the pathogenesis of inflammatory bowel disease. Journal of Immunology Research. 2019: 1-7.

34. Catena F, De Simone B, Coccolini F, Di Saverio S, Sartelli M, Ansaloni L. Bowel obstruction: a narrative review for all physicians. World Journal of Emergency Surgery. 2019:1-8.
35. Ward BC, Panitch A. Abdominal adhesions: current and novel therapies. Journal of Surgical Research. 2011:91-111.
36. https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/digestive-diagnostic-procedures/Accessed on 24/02/2024.
37. Maccioni F, Busato L, Valenti A, Cardaccio S, Longhi A, Catalano C. Magnetic Resonance Imaging of the Gastrointestinal Tract: Current Role, Recent Advancements and Future Prospectives. Diagnostics. 2023:2410-21.
38. https://ukhealthcare.uky.edu/digestive-health-program/prevention/Accessedon 27/02/2024.