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Advances in Bioresearch

CASE STUDY

Clinical Profile, Histological Diagnosis, and Therapeutic Response to Budesonide in Microscopic Colitis: A Case Series

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ABSTRACT
Microscopic colitis is a chronic inflammatory bowel disorder characterized by chronic, watery, non-bloody diarrhea, often associated with abdominal pain and reduced quality of life. Diagnosis relies on histological evaluation of colon biopsies due to typically normal colonoscopy findings. To evaluate the clinical presentation, histological features, and therapeutic response to budesonide therapy in patients with microscopic colitis. We report a retrospective case series of four patients diagnosed with microscopic colitis (collagenous and lymphocytic variants). Clinical symptoms, colonoscopy findings, histopathological diagnosis, and therapeutic outcomes following a standardized budesonide treatment regimen were reviewed. Four patients (two males, two females; age range 25–65 years) presented with chronic watery diarrhea (frequency 4–10 stools/day) accompanied by abdominal pain and weakness. Colonoscopy appeared normal in three patients and revealed colonic diverticula in one patient. Histopathology confirmed collagenous colitis in three patients and lymphocytic colitis in one. Patients received budesonide 9 mg daily for six weeks, followed by tapering over an additional six weeks. Clinical remission (≤2 stools/day, minimal watery stools, and resolution of abdominal pain) was achieved between 6–8 weeks in three patients and by 10 weeks in the remaining patient. No significant adverse effects were noted during therapy. Budesonide therapy effectively induced clinical remission and symptom relief in patients with microscopic colitis, underscoring its value as a first-line treatment option. Histopathological assessment remains crucial for accurate diagnosis in the presence of persistent watery diarrhea despite normal colonoscopy findings.
Keywords: *Case series, Watery diarrhea, Histopathology, Microscopic colitis, Budesonide*

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INTRODUCTION

Microscopic colitis is a chronic inflammatory condition of the large intestine, primarily presenting as persistent, non-bloody, watery diarrhea. Although colonoscopy findings often appear normal or only mildly altered, the diagnosis is confirmed histologically through biopsy. There are two main histopathological subtypes: collagenous colitis, which features a markedly thickened subepithelial collagen band, and lymphocytic colitis, characterized by an increased infiltration of intraepithelial lymphocytes. Despite their histological differences, both subtypes exhibit similar clinical symptoms and therapeutic approaches [1]. The precise aetiology of microscopic colitis remains elusive; however, it is widely considered to involve a complex interaction of environmental, genetic, and immunological factors. The condition has been linked to the use of various medications, including non-steroidal anti-inflammatory drugs (NSAIDs), proton pump inhibitors (PPIs), selective serotonin reuptake inhibitors (SSRIs), beta-blockers, and statins. Additionally, tobacco use has been consistently associated with an increased risk of developing the disease [2]. From an epidemiological standpoint, microscopic colitis is more commonly diagnosed in older adults, with a marked predominance in females. In recent years, reported cases have increased, possibly due to improved diagnostic awareness and biopsy practices. Although the disease can significantly affect patients' quality of life, it does not appear to raise the risk of colorectal cancer, and long-term survival is generally unaffected [3]. Accurate diagnosis of microscopic

colitis relies on histological evaluation of colonic tissue samples, as endoscopic and radiologic findings often fail to detect the condition. Budesonide has emerged as the first-line therapy due to its efficacy in inducing and maintaining clinical remission. In patients with refractory disease, immunosuppressive agents may be considered as alternative treatment options [4].

PATIENT INFORMATION

Patient 1

A 27-year-old man presents with a two-month history of eight to ten episodes of watery, non-bloody diarrhea per day, associated with crampy periumbilical abdominal pain and weakness. He self-treated with Tab Ofloxacin + ornidazole and probiotic without relief. He denies fever, vomiting, nausea, allergies, or any systemic comorbidities. There is no significant past medical or family history.

Patient 2

A 25-year-old woman presented with a four-day history of loose, watery stools occurring five to six times daily. She reported similar self-limited episodes over the past year, each lasting several days and associated with crampy lower abdominal pain. Despite trials of various empiric therapies prescribed by multiple practitioners, she experienced no sustained relief. She denied bloody, mucus passage, nausea, vomiting, fever, weight loss, nocturnal symptoms, or systemic complaints such as rash or arthralgias. Her appetite remained unchanged. She has no known drug allergies, no significant past medical history, and no family history of gastrointestinal disease.

Patient 3

A 52-year-old woman presented with a 6–7-month history of loose stools occurring six to seven times daily, including nocturnal episodes, associated with crampy abdominal pain and weakness. She denied blood or mucus in the stool, fever, vomiting, recent travel, or dietary changes. Her medical and family histories were unremarkable, with no known drug allergies.

Patient 4

A 65-year-old man presented with a three-month history of chronic, non-bloody, watery diarrhea occurring four to five times daily, accompanied by unintentional weight loss, poor appetite, and generalized weakness. He denied any blood or mucus in the stool, fever, vomiting, recent travel, or dietary changes. His past medical history is notable for eosinophilic enteritis in 2021. There is no other significant family history of gastrointestinal disease, and he has no known drug allergies.

Clinical Findings

Findings observed at the time of admission in all four patients are listed in Table 1.

Table 1 Clinical Findings

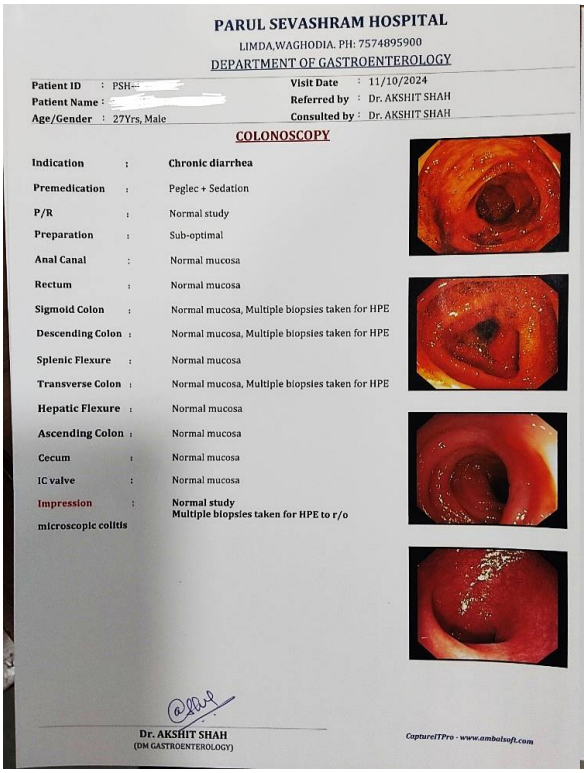
	Patient 1	Patient 2	Patient 3	Patient 4
General examination	Normal	Normal	Normal	Normal
Abdominal Tenderness	Umbilical region	Hypogastric region	Epigastric and hypogastric region	None
Systemic examination	Normal	Normal	Normal	Normal

DIAGNOSTIC ASSESSMENT

Diagnostic Assessment of the case series will be described in Table 2.

Table 2 Diagnostic Assessment

	Patient 1	Patient 2	Patient 3	Patient 4
Blood Investigation	Normal	Normal	Normal	Normal
CECT Abdomen	No abnormality	No abnormality, Mild rotated ectopic right kidney	No abnormality	Diverticulitis in descending colon. Sliding hiatus Hernia. Atrophied left lobe and right lobe, hyper trophied of caudate lobe with surface irregularity, however normal enhancement of liver parenchyma.
Upper GI Endoscopy	Normal	Gastric ulcer (RUT Positive), D2 biopsy taken for HPE	Normal	Pangastritis (RUT Positive), D2 biopsy taken for HPE
Colonoscopy	Normal, Multiple ascending, transverse and descending colon biopsies taken Figure 1	Normal, Multiple ascending, transverse and descending colon biopsies taken Figure 2	Normal, Multiple ascending, transverse and descending colon biopsies taken Figure 3	Colonic Diverticula, Multiple ascending, transverse and descending colon biopsies taken Figure 4
Histopathology	Collagenous colitis Figure 5	Duodenitis, lymphocytic colitis Figure 6	Collagenous colitis	Duodenitis, collagenous colitis Figure 7



PARUL SEVASHRAM HOSPITAL
LIMDA,WAGHODIA. PH: 7574895900
DEPARTMENT OF GASTROENTEROLOGY

Patient ID : PSH-
Patient Name :
Age/Gender : 27Yrs, Male
Visit Date : 11/10/2024
Referred by : Dr. AKSHIT SHAH
Consulted by : Dr. AKSHIT SHAH

COLONOSCOPY

Indication	Chronic diarrhea
Premedication	Peglec + Sedation
P/R	Normal study
Preparation	Sub-optimal
Anal Canal	Normal mucosa
Rectum	Normal mucosa
Sigmoid Colon	Normal mucosa, Multiple biopsies taken for HPE
Descending Colon	Normal mucosa, Multiple biopsies taken for HPE
Splenic Flexure	Normal mucosa
Transverse Colon	Normal mucosa, Multiple biopsies taken for HPE
Hepatic Flexure	Normal mucosa
Ascending Colon	Normal mucosa
Cecum	Normal mucosa
IC valve	Normal mucosa
Impression	Normal study Multiple biopsies taken for HPE to r/o microscopic colitis

Dr. AKSHIT SHAH
(DM GASTROENTEROLOGY)

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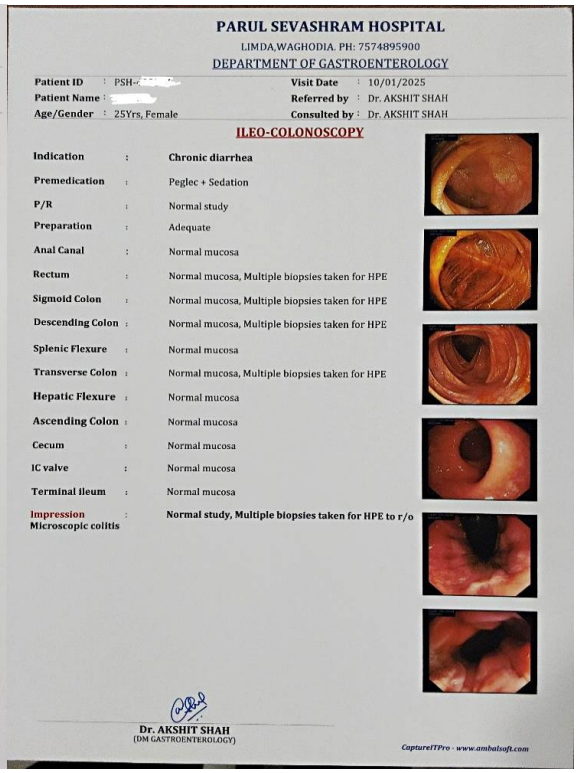
Figure 1 Colonoscopy (Patient 1)



PARUL SEVASHRAM HOSPITAL
LIMDA,WAGHODIA. PH: 7574895900
DEPARTMENT OF GASTROENTEROLOGY

Patient ID : PSH-
Patient Name :
Age/Gender : 25Yrs, Female
Visit Date : 10/01/2025
Referred by : Dr. AKSHIT SHAH
Consulted by : Dr. AKSHIT SHAH

ILEO-COLONOSCOPY

Indication	Chronic diarrhea
Premedication	Peglec + Sedation
P/R	Normal study
Preparation	Adequate
Anal Canal	Normal mucosa
Rectum	Normal mucosa, Multiple biopsies taken for HPE
Sigmoid Colon	Normal mucosa, Multiple biopsies taken for HPE
Descending Colon	Normal mucosa, Multiple biopsies taken for HPE
Splenic Flexure	Normal mucosa
Transverse Colon	Normal mucosa, Multiple biopsies taken for HPE
Hepatic Flexure	Normal mucosa
Ascending Colon	Normal mucosa
Cecum	Normal mucosa
IC valve	Normal mucosa
Terminal ileum	Normal mucosa
Impression	Normal study, Multiple biopsies taken for HPE to r/o Microscopic colitis

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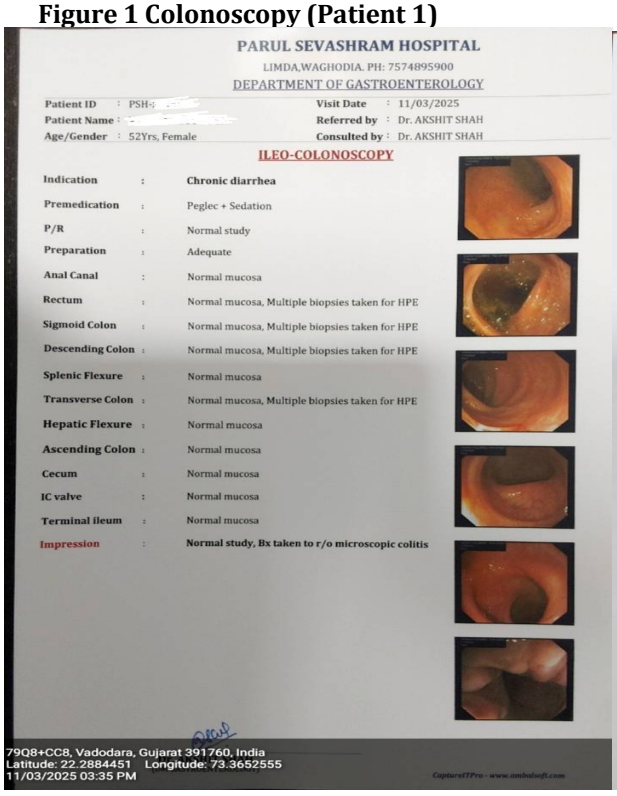
Figure 2 Ileo-Colonoscopy (Patient 2)



PARUL SEVASHRAM HOSPITAL
LIMDA,WAGHODIA. PH: 7574895900
DEPARTMENT OF GASTROENTEROLOGY

Patient ID : PSH-
Patient Name :
Age/Gender : 52Yrs, Female
Visit Date : 11/03/2025
Referred by : Dr. AKSHIT SHAH
Consulted by : Dr. AKSHIT SHAH

ILEO-COLONOSCOPY

Indication	Chronic diarrhea
Premedication	Peglec + Sedation
P/R	Normal study
Preparation	Adequate
Anal Canal	Normal mucosa
Rectum	Normal mucosa, Multiple biopsies taken for HPE
Sigmoid Colon	Normal mucosa, Multiple biopsies taken for HPE
Descending Colon	Normal mucosa, Multiple biopsies taken for HPE
Splenic Flexure	Normal mucosa
Transverse Colon	Normal mucosa, Multiple biopsies taken for HPE
Hepatic Flexure	Normal mucosa
Ascending Colon	Normal mucosa
Cecum	Normal mucosa
IC valve	Normal mucosa
Terminal ileum	Normal mucosa
Impression	Normal study, Bx taken to r/o microscopic colitis

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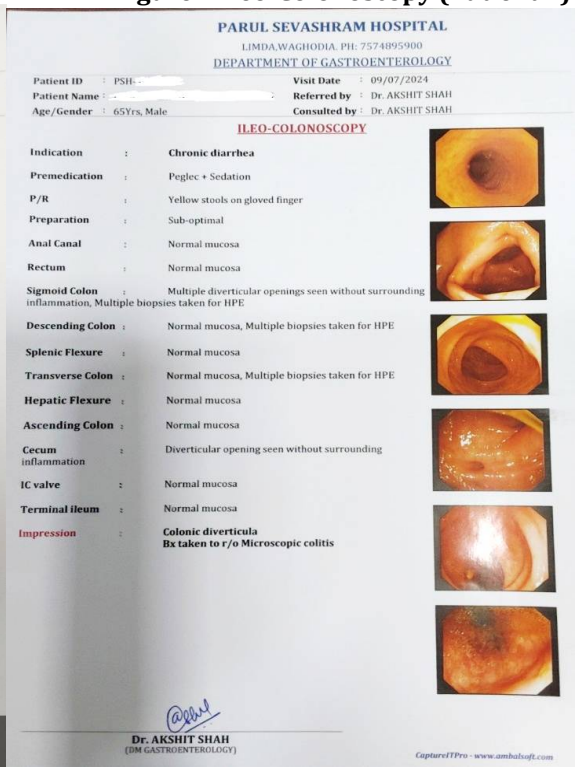
Figure 3 Ileo-Colonoscopy (Patient 3)



PARUL SEVASHRAM HOSPITAL
LIMDA,WAGHODIA. PH: 7574895900
DEPARTMENT OF GASTROENTEROLOGY

Patient ID : PSH-
Patient Name :
Age/Gender : 65Yrs, Male
Visit Date : 09/07/2024
Referred by : Dr. AKSHIT SHAH
Consulted by : Dr. AKSHIT SHAH

ILEO-COLONOSCOPY

Indication	Chronic diarrhea
Premedication	Peglec + Sedation
P/R	Yellow stools on gloved finger
Preparation	Sub-optimal
Anal Canal	Normal mucosa
Rectum	Normal mucosa
Sigmoid Colon	Multiple diverticular openings seen without surrounding inflammation, Multiple biopsies taken for HPE
Descending Colon	Normal mucosa, Multiple biopsies taken for HPE
Splenic Flexure	Normal mucosa
Transverse Colon	Normal mucosa, Multiple biopsies taken for HPE
Hepatic Flexure	Normal mucosa
Ascending Colon	Normal mucosa
Cecum	Diverticular opening seen without surrounding inflammation
IC valve	Normal mucosa
Terminal ileum	Normal mucosa
Impression	Colonic diverticula Bx taken to r/o Microscopic colitis

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Figure 4 Ileo-Colonoscopy (Patient 4)

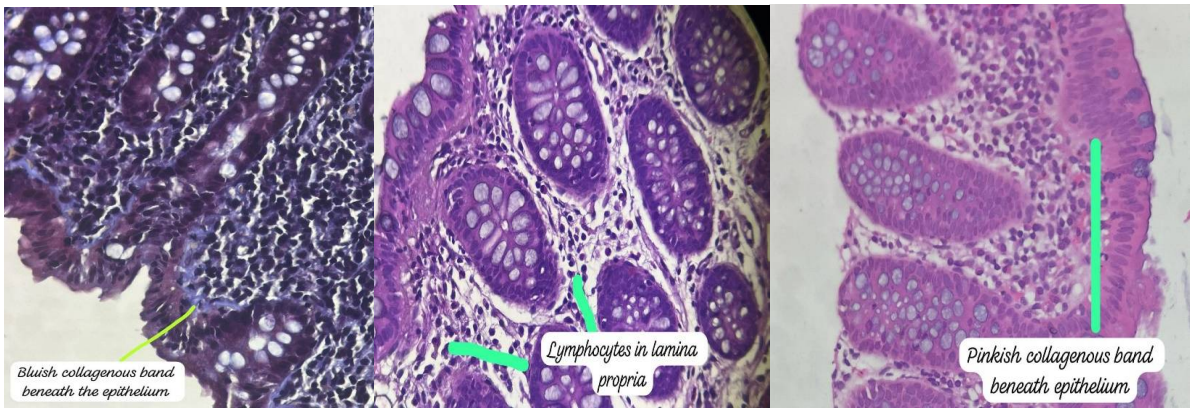

Figure 5 Collagenous colitis (Patient 1) Figure 6 lymphocytic colitis (Patient 2) Figure 7 Collagenous colitis (Patient 4)

Therapeutic intervention

The therapeutic intervention (5,6) of the case series will be described in Table 3.

Table 3 Therapeutic intervention

Remission dose	Tab Budesonide 9mg OD daily for 6 weeks
Maintenance dose	Tab Budesonide 6mg OD daily for 2 weeks Tab Budesonide 3mg OD daily for 2 weeks Tab Budesonide 3mg OD alternate day for 2 weeks

Follow up & Outcomes

The Follow up outcome of this case series reveals that the patient feels relieved in signs and symptoms and it will be described in Table 4.

Table 4 Follow up & Outcomes

Symptoms	Patient 1				Patient 2				Patient 3				Patient 4			
Follow Up	6th week	8th week	10th week	12th week	6th week	8th week	10th week	12th week	6th week	8th week	10th week	12th week	6th week	8th week	10th week	12th week
Diarrhoea	2-3/day	1-2/day	1/day	1/day	1-2/day	1/day	1/day	1/day	1-2/day	1-2/day	1/day	1/day	2/day	2/day	1/day	1/day
Abdominal pain (VAS)	3	1	-	-	2	1	-	-	4	2	1	-	2	1	1	-
Weakness	Improved	-	-	-	-	-	-	-	Improved	-	-	-	Improved	-	-	-
Weight gain	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+
Appetite	-	-	-	-	-	-	-	-	-	-	-	-	Good	-	-	-

DISCUSSION

This retrospective case series illustrates the clinical presentation, diagnostic approach, and therapeutic response to budesonide in patients diagnosed with microscopic colitis, specifically collagenous and lymphocytic colitis (7). The cases presented highlight the common clinical presentation characterized by chronic watery, non-bloody diarrhoea often accompanied by abdominal pain and systemic symptoms such as weakness. Despite the chronic and significant symptomatology, colonoscopic examinations appeared largely normal or showed only minor nonspecific findings, reinforcing the necessity of histopathological evaluation for definitive diagnosis. This highlights the importance of having a high degree of suspicion for the diagnosis of microscopic colitis in patients presenting with chronic diarrhea without any other identifiable etiology. Our patients' histopathological findings align well with previous literature, where collagenous colitis is characterized by a thickened subepithelial collagen layer, and lymphocytic colitis features increased intraepithelial lymphocytes. This histological diagnosis is critical, given the frequently normal macroscopic appearance during colonoscopy. These observations reinforce existing guidelines that advocate biopsy of normal-appearing colonic mucosa in patients with persistent watery diarrhoea and unremarkable colonoscopic findings. The etiological factors associated with

microscopic colitis remain multifactorial, involving potential genetic predisposition, autoimmune processes, and environmental triggers such as medication use and smoking. In our patient cohort, a clear etiologic factor was not identified; however, medication history in patient 1 included unsuccessful antibiotic and probiotic therapy, reflecting the typical scenario encountered in clinical practice where empirical therapies often fail to provide relief. Therapeutically, budesonide has emerged as the most effective treatment modality due to its potent topical anti-inflammatory action on the colonic mucosa combined with minimal systemic absorption, thus reducing systemic side effects. In our case series, budesonide therapy effectively induced clinical remission within 6–8 weeks in three patients, while the fourth patient achieved remission by 10 weeks. This aligns with previous studies demonstrating budesonide's efficacy, with remission rates typically reported between 70% and 90% within the first 6–8 weeks of therapy. Additionally, our findings support budesonide's safety profile, as no patients experienced significant adverse effects during therapy.

Notably, patient 4 had underlying gastrointestinal comorbidities including eosinophilic enteritis, conditions that may have contributed to delayed remission and complicating the clinical course. This highlights the importance of thorough diagnostic evaluation and tailored therapeutic approaches in patients with overlapping gastrointestinal pathologies. Our series further emphasizes the importance of structured tapering regimens following budesonide induction to maintain remission and minimize the risk of symptom recurrence effects and avoid adverse. The maintenance protocol employed—initially high-dose induction therapy followed by gradual dose tapering—is consistent with established clinical practice guidelines. In conclusion, our case series supports existing literature regarding microscopic colitis' clinical features, histopathological diagnosis, and the efficacy of budesonide as first-line therapy. It underscores the need for histological assessment even in cases of normal colonoscopic findings and advocates for structured therapeutic regimens to ensure sustained clinical remission.

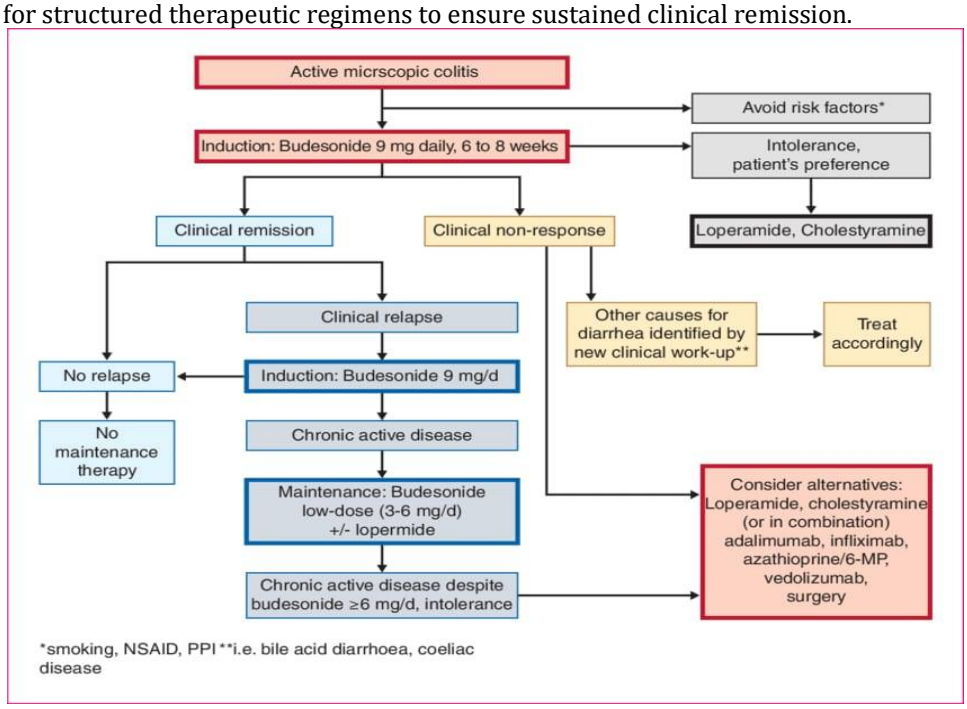

Figure 1 Therapeutic intervention (8)

CONCLUSION

Microscopic colitis, diagnosed through histopathological evaluation, should be considered in patients presenting with chronic, watery diarrhoea despite normal colonoscopic findings. Budesonide therapy, with an induction followed by a tapering maintenance regimen, effectively achieves clinical remission and symptom relief. This therapeutic approach demonstrates favourable efficacy and safety profiles, reinforcing its role as the preferred first-line treatment in managing microscopic colitis.

Conflicts of interest: There are no conflicts of interest.

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