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Functional Remission of Ulcerative Colitis and Crohn's Disease Through Microbiome Restoration, Nutritional Therapy, and Targeted Supplementation: A Case Report

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ABSTRACT

Background: Inflammatory Bowel Disease (IBD) is a chronic inflammatory disease of the gastrointestinal tract, having various manifestations and a multifactorial nature, mainly involving ulcerative colitis (UC) and Crohn's disease (CD). Conventional therapies focus on providing symptomatic relief; however, they fail to treat the underlying issues, which frequently result in relapse. Emerging functional nutrition-based approaches that use precision diagnostics offer a root-cause analysis to address gut dysbiosis, mucosal inflammation, immune dysfunction and support overall well-being.

Case Presentation: A 39-year-old male patient having a documented medical history of both UC and CD presented with an uneasy stomach, frequent bloating, loose stools, persistent indigestion and adrenal fatigue, despite a normal colonoscopy and endoscopy with no active bleeding. Comprehensive functional evaluation through GI-MAP (Gastrointestinal Microbial Assay Plus) and blood chemistry analysis confirmed the presence of *Helicobacter pylori* and enteropathogenic *Escherichia coli* infections, critically low secretory IgA (sIgA), acute systemic inflammation, and multiple metabolic issues that include fasting hyperinsulinemia, high ferritin and low vitamin D levels.

Discussion: A structured 90-day functional nutrition protocol was implemented that comprises gut lining repair, targeted pathogen elimination, and immune health restoration, using an anti-inflammatory diet plan, targeted supplementation, and evidence-based lifestyle interventions. Repeat laboratory analysis demonstrated major improvements in hs-CRP, serum triglycerides, vitamin D, fasting insulin and eGFR. The patient also experienced complete relief from bloating and irregular bowel movements, alongside improved digestion and restored energy levels following the protocol.

Conclusion: This case report highlights that a targeted functional nutrition-based approach focused on root causes can result in measurable clinical improvements in IBD-related health issues when conventional therapy alone is insufficient. The findings of this study also form a strong base supporting the growing evidence for structured functional nutrition-based protocols as primary strategies in IBD management.

Keywords: Crohn's disease, Functional Nutrition**,** Inflammatory Bowel Disease, Supplements, Ulcerative colitis

INTRODUCTION

Inflammatory Bowel Disease (IBD) is a complex, multifactorial disease of the gastrointestinal tract defined by chronic relapsing inflammation encompassing two principal phenotypes- ulcerative colitis (UC) and Crohn's disease (CD) (1). The etiology of the disease is not clearly known; however, recent studies suggest that environmental factors, genetics, microbial constitution and immune responses are responsible for the pathogenesis (2). From the year 1990 to 2021, the global age-standardized rate (ASR) of incidence with respect to IBD has increased significantly. About 3.8 million individuals were affected by IBD in 2021 with ASR of incidence and mortality of 4.4 and 0.5, respectively (3). In Indian population, the ASR of incidence, prevalence, mortality, and disability rates of the disease in the year 2019 were 2.34, 20.34, 0.40, and 13.04, respectively (4). UC, having a global prevalence of 5 million cases in 2023, affects the rectum and colon characterized by bloody diarrhea (5, 6). On the other hand, CD is characterized by inflammation in any segment of the gastrointestinal tract, often presenting with pain in the abdomen, diarrhea, weight loss and exhaustion (7).

While conventional therapies and treatments are continuously being used to manage IBD, many patients in endoscopic remission continue to experience persistent gastrointestinal issues, exhaustion and a poor quality of life which underscores a significant divide between structural recovery and true patient wellness (8). This emphasizes the need for a more holistic approach that focuses on root cause analysis in order to address the disease patterns, thereby improving the quality of life.

Emerging evidence suggests that IBD is accompanied by a reduction in microbial diversity, indicating a negative correlation between microbial diversity and disease severity in IBD (9). Gut dysbiosis, characterized by a decrease in certain microbial strains of *Firmicutes*, *Bacteroidetes*, and *Actinobacteria* and an increase in *Proteobacteria* and pathobionts, is a key feature of IBD in addition to impaired intestinal barrier function and immune hyperactivation (10). Two keystone commensal gut microorganisms, namely, *Faecalibacterium prausnitzii* and *Akkermansia muciniphila* are found to be in lower amounts in patients having either UC or CD (11). The depletion of these two bacteria is associated with mucosal barrier disruption and intestinal inflammation (12). Additionally, *Helicobacter pylori*, known to colonize the gastric mucosa of about 43% of the global population, is one of the most common bacterial infections causing gastritis, peptic ulcers, and even gastric cancer (13). A range of virulence factors are involved in its pathogenesis which promote mucosal colonization, immune evasion, and chronic inflammation (14). Moreover, enteropathogenic *E. coli* (EPEC) and enterohemorrhagic *E. coli* (EHEC) are also well-studied drivers of acute gastroenteritis in humans (15). Secretory immunoglobulin A (SIgA), the first line of defence in the gut, prevents pathogenic strains and antigens from entering the intestinal lumen by blocking their access to epithelial receptors, entrapping them in mucus and enabling their elimination through peristaltic and mucociliary action (16). IgA is crucial and non-redundant in maintaining the composition of the human gut microbiota, and secretory IgA has evolved to promote a stable and diverse intestinal microbial community (17). Patients who lack IgA may also develop concurrent autoimmune disease. Medication side effects or infections could be the secondary causes, but they are reversible. Nearly 20-30% of people with IgA deficiency also experience severe respiratory and gastrointestinal tract infections (18). Functional nutrition addresses these interconnected domains through precision diagnostics and

personalized, root cause-based therapeutic strategies.

The present case study describes a 39-year-old male patient with a medical history of both UC and CD. The patient presented with an uneasy stomach, chronic bloating, loose stools, indigestion and adrenal fatigue, despite a normal colonoscopy and endoscopy showing no active bleeding. The patient thereafter followed a 90-day functional nutrition-based protocol targeted towards gut lining repair, pathogen elimination, and immune health restoration using an anti-inflammatory diet plan, personalized supplementation, and certain lifestyle interventions. This study aims to validate a functional nutrition-based approach for IBD by analyzing the clinical outcomes of the patient following this protocol, thereby contributing to the establishment of a nutritional framework for integrative care in complex clinical settings with respect to IBD.

CASE PRESENTATION

We present a case of a 39-year-old male from Mumbai, India, who approached ThriveTribe Wellness Solutions Private Limited, Pune, India, with a complex case of chronic gastrointestinal issues that conventional treatment could not successfully address. Initial measurements taken at the start of the program were- height: 176 cm, weight: 71 kg, waist circumference: 32 inches, and BMI: 22.9 kg/m^2. His weight at the end of the program was 67.5 kg and his BMI was 21.8 kg/m^2.

The patient was previously diagnosed with both UC and CD before enrolling in the program. Colonoscopy and endoscopy showed normal findings with no active mucosal bleeding. He also complained of chronic bloating, loose stools, indigestion, acid reflux, abdominal pain, and flatulence. Sleep was significantly disrupted with dysregulated cortisol levels as well as adrenal fatigue. The patient also experienced inconsistent energy levels with a mid-day dip. It is best known that he did not take any major immunosuppressants or biologics prior to starting the program.

He enrolled into the 90-day functional nutrition program at this time and agreed to begin his treatment in August 2025. His medical history and summary of interventions followed during this period are provided in Table 1.

Table 1. Timeline of Past Medical History, Diagnosis and Interventions

Date	**Relevant past medical history and interventions**		
Nov 2024	Age: 39 years, male Current illness: Presented with chronic bloating, loose stools, indigestion, acid reflux, abdominal pain, and flatulence, despite a normal colonoscopy and endoscopy. Sleep severely disrupted. Prior IBD diagnoses with both Crohn's disease and ulcerative colitis Previous diagnoses: Crohn's disease and ulcerative colitis Medication history**:** No major medications before enrolling in the program. Negative colonoscopy and endoscopy (no active mucosal bleeding reported).		
Date	**Summaries from initial & follow-up visits**	**Diagnostic testing**	**Interventions**
Aug 2025	Enrolled in functional nutrition program. Presenting complaints: chronic bloating, loose stools, acid reflux, abdominal pain, flatulence, mid-day energy dips, sleep disturbance, and adrenal fatigue. Weight: 71 kg; BMI:	Blood chemistry revealed: hsCRP- 3.5 mg/L Ferritin- 317 ng/mL Vitamin D- 33.1 ng/mL Fasting insulin- 6.8 µIU/mL Triglycerides- 104 mg/dL	Gut Lining Repair: Colostrum, L-Glutamine, digestive enzymes, Akkermansia, detox binder provided as supplements. Anti-inflammatory diet: Removed gluten, dairy, sugar, refined seed oils, processed foods. Added anti-inflammatory whole foods, A2 ghee/coconut oil for cooking. Lifestyle modifications: Blue light restriction, sleep hygiene, circadian reset, grounding, breathing exercises, 3 L water/day.

	22.9 kg/m².	HDL- 47 mg/dL Creatinine- 1.15 mg/dL eGFR- 83 GI-MAP revealed: *H. pylori*- 1.82×10^3 EHEC- 5.87×10^3 *A. muciniphila*- <Detection limit SIgA- <210 µg/g Pancreatic elastase- 145 µg/g	
Sept-Oct 2025	Reported reduction in bloating frequency; improved stool consistency; early improvement in energy levels. Sleep disruption persists.	No repeat testing at this interim phase. Progress is monitored regularly.	*H. pylori* eradication: H. pylori Support, Immune Support, Detox Binder provided as supplements. Supplements given for gut lining repair also continued.
Dec 2025	Complete resolution of bloating, loose stools, acid reflux, and flatulence. Energy levels stable throughout the day. Sleep significantly improved. Digestion normalized even after occasional restaurant meals. Weight: 67.5 kg; BMI: 21.8 kg/m².	Repeat blood chemistry: hsCRP- 2.82 mg/L; Ferritin- 291 ng/mL; Vitamin D- 54.1 ng/mL Fasting insulin- 4.55 µIU/mL Triglycerides- 75 mg/dL HDL- 60 mg/dL Creatinine- 0.99 mg/dL eGFR- 99	Immunity & Microbiome Restoration: Immune Support, Probiotics with prebiotics, Detox Binder continued. Full essential supplement stack maintained (Magnesium Bisglycinate, Vitamin D3+K2, B-complex, Zinc, Omega-3, Glutathione, Black Seed Oil, EAA).

Abbreviations: BMI, Body mass index; hsCRP, high-sensitivity C-reactive protein; eGFR, Estimated Glomerular Filtration Rate; EHEC, enterohemorrhagic *Escherichia coli*; GI-MAP, Gastrointestinal Microbial Assay Plus; SIgA, Secretory immunoglobulin A; HDL, high-density lipoprotein; eGFR, estimated glomerular filtration rate; EAA, essential amino acids.

The customized diet protocol designed to eradicate GI distress and infections is outlined in Table 2. Quantitative PCR-based Gastrointestinal Microbial Assay Plus (GI-MAP, Diagnostic Solutions Laboratory) testing was also recommended to dig deeper into the underlying issues, in addition to routine blood tests.

Table 2. Customized Diet Plan for the Patient

Meal Timing	**Components of Meals**
Empty Stomach	1 tsp Nutmeg-ginger extract + 2-4 tulsi leaves
Breakfast (7:30-8:30 am)	Option 1: 2-3 scrambled eggs with mashed avocado and sauteed veggies Option 2: 3 eggs French omelette with added veggies, mushrooms and 2 slices of avocado Option 3: 2 oats-egg banana or berries pancakes
Lunch (12:30-	Option 1: ½ bowl of stir-fried vegetables or steamed salad with 200 g chicken/mutton/fish and a bowl of steamed white rice or 1-2 roti (amaranth, rice or oats)

1:30 pm)	Option 2: 1 bowl of sprouts curry alongside chicken/mutton biryani with veggies Note: Red meat is advised to be consumed only once a week
Snacks (if hungry)	2-3 protein or coconut cookies/1 home-made protein bar with 1 cup of peppermint/lemongrass/hibiscus tea
Dinner (Before 7 pm)	Option 1: 150-200 g grilled chicken with herbed rice Option 2: 100-150 g stir-fried fish with 1 rice roti Option 3: 80-100 g grilled prawns with steamed rice

Initial blood test reports (Table 3) showed slightly elevated hsCRP (3.5 mg/L) with very high ferritin (317 ng/mL), suggesting acute infection-driven iron sequestration and inflammation. Vitamin D was critically low (33.1 ng/mL), possibly leading to immune suppression and intestinal permeability. Fasting insulin was high at 6.8 µIU/mL, suggesting subclinical insulin resistance driven by systemic inflammation in the intestinal lining. Homocysteine levels were elevated at 16.8 µmol/L, indicative of poor B-vitamin status, inflammation and methylation pathway dysfunction. HDL cholesterol was low at 47 mg/dL and triglycerides were borderline high at 104 mg/dL. The patient also has high Lipoprotein(a) [Lp(a)], a genetic marker for cardiac risk that requires careful metabolic management.

Table 3. Serum Analysis of Key Parameters at Baseline and Post-program

Parameters	**Baseline (Aug 2025)**	**Post-Program (Dec 2025)**	**Optimal Range**	**Status**
hsCRP (mg/L)	3.5	2.82	< 1.0	Improved
Ferritin (ng/mL)	317	291	75-150	Improved
Vitamin D (ng/mL)	33.1	54.1	50-60	Fixed
Fasting Insulin (µIU/mL)	6.8	4.55	< 5.0	Fixed
Triglycerides, Serum (mg/dL)	104	75	50-90	Fixed
HDL Cholesterol (mg/dL)	47	60	55-75	Fixed
Cholesterol/HDL Ratio	4.37	3.66	< 3.0	Improved
Creatinine (mg/dL)	1.15	0.99	0.8-1.1	Fixed
eGFR	83	99	> 90	Fixed
Magnesium (mg/dL)	2.0	2.2	2.2-2.5	Fixed
LDH (U/L)	211	187	140-175	Improved
Albumin (g/dL)	4.3	4.53	4.5-5.0	Fixed
Sodium (mmol/L)	135	140	139-142	Fixed
Phosphorus (mg/dL)	2.3	3.2	3.0-3.5	Fixed

Abbreviations: hsCRP, high-sensitivity C-reactive protein; HDL, high-density lipoprotein; LDH, lactate dehydrogenase; eGFR, estimated glomerular filtration rate.

GI-MAP testing (Table 4) showed high-burden pathogenic bacterial infections - *H. pylori* (1.82×10^3) and enterohemorrhagic *E. coli* (5.87×10^3), both responsible for causing severe mucosal inflammation and chronic gut dysfunction. A notable overgrowth of *Morganella* spp., and depletion of *A. municiphila* were also observed along with SIgA and pancreatic elastase-1 being critically low. Decrease in SIgA denotes an increased risk of further infection and dysbiosis, while low pancreatic elastase-1 levels can signify exocrine pancreatic insufficiency (EPI), which can prevent proper fat digestion (16, 17, 19).

Table 4. Key GI-MAP Findings of the Patient

Marker	**Optimal Range**	**Result**	**Status**
H. pylori	$< 1.00\times10^3$	1.82×10^3	High
EHEC (*E. coli*)	$< 1.00\times10^3$	5.87×10^3	High
Akkermansia municiphila	1.0×10^1-8.2×10^6	<Detection Limit	Absent
Secretory IgA (SIgA) (µg/g)	510-2010	< 210	Critically Low

Pancreatic Elastase-1 (µg/g)	> 200	145	Low
Morganella spp.	< 1.00×10^3	3.54×10^6	High

Abbreviations: EHEC, enterohemorrhagic *Escherichia coli*; SIgA, secretory immunoglobulin A; GI-MAP, Gastrointestinal Microbial Assay Plus; SIBO, small intestinal bacterial overgrowth.

Based on these results, the patient was advised to follow the diet protocol customized for his needs and requirements (Table 2). The diet protocol aimed to help the patient recover from gastrointestinal inflammation, gut dysbiosis, severe bloating, indigestion and abdominal pain. The 90-day functional nutrition protocol was strategically divided into three phases in order to address the root causes of IBD. The first phase emphasized on food and nutrition- eliminating wheat (gluten), dairy, refined sugar, corn, soy, and seed oils from the patient's regular diet and including sourdough/rice/sorghum bread, amaranth, oats, and high-quality animal proteins (chicken/seafood) instead. Furthermore, anti-inflammatory shots (concoction of ginger, turmeric, and curry leaves) and cabbage juice for mucosal repair and gut healing was also added in the diet. The second phase focused on implementing targeted supplementation to eradicate pathogens and support eubiosis in the gut. The complete list of supplements and their respective dosage is listed in detail in Table 5. The third phase of the protocol was based on lifestyle modifications and biohacking. It included (i) light therapy- installing blue light filters on devices, and restricting screen time post 9 pm to reset his circadian rhythm, (ii) grounding and earthing- walking barefoot to reduce cortisol, (iii) cold therapy- ice showers/baths two to three times a week for muscle recovery and vagus nerve toning.

Table 5. Supplement Regimen of the patient

Supplement	Brand Name	Dosage
Magnesium Bisglycinate	iThrive Essentials, India	½ scoop after dinner
Vitamin D3 + K2 (600 IU + 20 mcg	iThrive Essentials, India	3-4 drops under the tongue
B-Complex	iThrive Essentials, India	2 capsules after breakfast
Zinc	iThrive Essentials, India	1 capsule (2 h post-meal)
Omega-3	iThrive Essentials, India	1 capsule twice daily
Glutathione	FM Nutrition, India	2 capsules daily on an empty stomach
Black Seed Oil	Caraway, India	1 tsp in water daily after breakfast
EAA	Klr.Fit, India	1 scoop within 30 min post-workout
Colostrum	Codeage, USA	1 scoop in 50 mL water post breakfast
L-Glutamine	Optimum Nutrition, India	1 scoop in 200 mL water (60-min gap from meals)
Digestive Enzymes	Trexgenics, India	1 capsule 20 min before meals
Akkermansia	Codeage, USA	1 capsule 15 min before meal
Detox Binder	iThrive Essentials, India	2 capsules (2 hrs after meal)
H. pylori Support	Zenmen, USA	2 capsules after breakfast, 1 capsule after lunch
Immune Support	iThrive Essentials, India	2 capsules twice daily
Probiotics with Prebiotics	iThrive Essentials, India	1 capsule daily before meals

Abbreviations: EAA, essential amino acids; IU, International unit

Following the completion of the program, the patient witnessed a major improvement in his bloating and gastrointestinal issues, including indigestion, even after having occasional restaurant meals. The patient felt so empowered by the results that he continued with the program for an additional month after its completion.

DISCUSSION

This case study discusses the effects of a personalized functional nutrition protocol on gut dysbiosis, mucosal barrier disruption

and metabolic dysfunction, which altogether may contribute to IBD in humans. The patient in the case study, despite having normal colonoscopy and endoscopy reports, suffered from severe bloating, loose stools, abdominal pain, acid reflux, indigestion and fatigue, which placed him in a sub-group of IBD patients whose mucosal healing does not always translate into disease resolution. A 2024 review by Aliu *et al.* provided an estimation that about one-third of patients with complete endoscopic remission, experience bloating, abdominal pain, irregular bowel movements, or faecal incontinence (20). Hence, this study supports this estimation, since his symptom burden can be traced to identifiable infectious and microbial abnormalities rather than active mucosal issues. *H. pylori* and enterohemorrhagic *E. coli* infection in the gut likely contributed to intestinal inflammation, acid reflux and chronic bloating. The customized diet protocol along with supplements, including Detox binder (iThrive Essentials, India), H. pylori support (Zenmen, USA), Probiotics with prebiotics (iThrive Essentials, India), and Akkermansia (Codeage, USA) helped the patient recover from his gastrointestinal issues to a great extent. It is to be noted that antibiotics were not recommended in order to protect an already fragile microbiome. Depletion of *Akkermansia muciniphila* in the gut is of particular importance since this commensal microorganism plays a key role in maintaining the protective intestinal mucus integrity, reducing inflammatory response, and decreasing gut permeability (21, 22). Additionally, polyphenols and their metabolites can also help in the modulation of gut microbiota by favouring the growth of *Bifidobacterium* and *Akkermansia muciniphila*, while inhibiting the growth of pathogenic strains (23). The patient had critically low SIgA (<210 µg/g), which represents a clinically under-recognized finding in IBD sequelae. Low SIgA compounds gastrointestinal issues by weakening the gut's first line of pathogen exclusion, thereby allowing antigen exposure and immune activation (16). The inclusion of supplements such as colostrum (Codeage, USA) rich in immunoglobulins and growth factors, and L-Glutamine (Optimum Nutrition, India) directly helps to maintain and improve gastrointestinal health. Bovine colostrum, which contains nutrients, hormones, growth factors, and paracrine factors, aids in mucosal healing across a wide range of infective and inflammatory conditions, including IBD. These properties can be utilized in many diseases in order to enhance recovery or in prevention (24). The metabolic improvements of the patient observed in fasting insulin (6.8 to 4.55 µIU/mL) and triglycerides (104 to 75 mg/dL), together with the rise in HDL cholesterol (47 to 60 mg/dL), depict the bidirectional relationship between gut health and cardiometabolic function. Correction of his vitamin D deficiency (33.1 to 54.1 ng/ mL) may also be important, as one meta-analysis of randomized clinical trials demonstrated that vitamin D supplementation lowered the risk of clinical relapse among patients with IBD, specifically those with CD in clinical remission (25). The lifestyle modifications recommended in this protocol include limited screen exposure before bed and soon after waking up for at least 30-40 minutes, along with proper sleep of about 7-8 hours and catching a few minutes of morning sunlight every day. Recent studies have elucidated mechanisms by which a misaligned circadian clock may weaken the intestinal barrier, alter short-chain fatty acid rhythmicity, and increase cortisol in patterns that resemble that of this patient's early morning awakening and fatigue (26, 27). While this literature is primarily mechanistic, it begins to provide a rationale for how these low-cost and simple interventions may have contributed to his clinical improvement.

This case study supports that clinically significant and measurable results can be obtained with functional nutrition and integrative medicine protocols in immune-mediated gastrointestinal disorders that are

not reaching complete remission with standard/conventional treatment options. The targeted nutritional therapy provided in this case, guided by GI- MAP testing, highlights the value of functional nutrition and medicine to identify underlying issues as part of the treatment plan.

CONCLUSION

This case study outlines the recovery of an adult patient diagnosed with both UC and CD after following a personalized functional nutrition protocol focused on root cause analysis after conventional treatment alone failed to address his IBD symptoms. Functional nutrition-based interventions to resolve the underlying issues of IBD, including gut dysbiosis, helped the patient correct his vitamin D deficiency, improve his hs-CRP level, normalize fasting insulin and achieve functional remission of IBD within 90 days of starting the program. The results of this study further support the clinical efforts made to integrate functional nutrition into the standard-of-care pathway for conventionally treated yet distressed IBD patients. Future prospective research designed for larger cohorts and a standardized GI- MAP along with blood chemistry will be required for broader generalization of this therapeutic model.

Declaration by Authors

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