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Overcoming Sepsis, Vasovagal Syncope, and Severe Gut Dysbiosis: A Case Report

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ABSTRACT

Background: Functional nutrition involves thorough diagnostics to identify the root causes of disease, followed by personalized nutrition therapy, strategic supplementation, lifestyle interventions, and elimination of environmental triggers.
Objectives: The purpose of this case report is to highlight functional nutrition intervention strategies used to address multi-system disease involving recurrent sepsis, moderate to severe stenosis in the left anterior descending (LAD) artery, chronic hives and swelling, and vasovagal syncope in a middle-aged male patient utilizing advanced diagnostic testing including Gastrointestinal Microbial Array Plus (GI-MAP) and comprehensive blood panel testing.
Case Presentation: Upon root cause analysis, gastrointestinal inflammation (Calprotectin: 935 µg/g), increased intestinal permeability (Zonulin: 163.5 ng/g), and overgrowth of pathogens like *Helicobacter pylori, Candida spp., Staphylococcus aureus,* and *Enterococcus faecalis* were identified. Following a nutrient-dense diet with a major focus on having low-histamine, anti-inflammatory foods, completion of a strategic 4-day detox program, targeted use of nutraceuticals, and reset of circadian rhythm, the patient witnessed significant improvements in his overall health and well-being.
Discussion: Healing gut dysbiosis, repairing leaky gut, and decreasing systemic inflammation through a functional nutrition approach resulted in substantial improvements in gastrointestinal, cardiometabolic and immune biomarkers.
Conclusion: Optimization of gut health with the use of gut-focused diagnostics and a functional nutrition approach led to reversal of previously unidentified multi-system disease.

Keywords: Functional nutrition, Gut dysbiosis, Sepsis, Vasovagal syncope

INTRODUCTION

The gut microbiome is a strong determinant of human health and disease. Dysbiosis, or changes in the gut microbiome, have been associated with many diseases outside the gastrointestinal tract. These include obesity, immune dysregulation, malnutrition, neurological dysfunction and even cancer (1). The intestinal epithelium is a selectively permeable barrier which, when damaged,

allows translocation of microbial metabolites, antigens and endotoxins such as lipopolysaccharide (LPS) into circulation, contributing to systemic low-grade inflammation (2,3). Gut dysbiosis has been causally linked to the pathogenesis of cardiovascular disease through mechanisms involving the production of an important gut microbe-dependent metabolite named trimethylamine N-oxide (TMAO), endotoxemia, and systemic inflammation (4–6). Similarly, increased intestinal permeability, commonly described as "leaky gut," has been associated with recurrent infections, allergic conditions including chronic urticaria, and autonomic nervous system dysregulation (7–9). Specifically, metagenomic and metabolomic studies of chronic spontaneous urticaria patients show that low-diversity gut microbiota, reduced short-chain fatty acid production, and elevated blood lipopolysaccharide levels drive IgE-mediated mast cell activation and correlate with disease severity (10).

Conventional medicine often manages such multi-system presentations in silos, with each condition addressed independently without considering shared upstream mechanisms. Functional nutrition provides an alternative model that utilizes advanced diagnostics and blood tests to identify the root causes and provides personalized interventions targeting diet, supplementation, lifestyle and environmental exposures. Molecular diagnostic tools, such as the quantitative polymerase chain reaction (qPCR)-based Gastrointestinal Microbial Array Plus (GI-MAP) test from Diagnostic Solutions Laboratory, USA, can be used for complete profiling of the gut microbiome, providing insights beyond the scope of conventional stool microscopy and culture.

This case report describes a middle-aged male with a complex, multi-system illness involving recurrent sepsis, moderate to severe stenosis in his left anterior descending (LAD) artery, hives and swelling, acute bacterial prostatitis and vasovagal syncope likely triggered by a viral or allergic reaction. A functional nutrition approach guided by advanced gut and blood diagnostics resulted in clinically meaningful improvement in his gastrointestinal, cardiometabolic and immune biomarkers.

CASE PRESENTATION

A middle-aged physically active male patient having regular gym attendance, no tobacco use, and minimal alcohol consumption presented to the functional nutrition team of ThriveTribe Wellness Solutions Private Limited, Pune, India, with chief complaints of recurrent severe illnesses, unintentional weight loss, chronic inflammation and low immunity. His symptoms started back in April 2024 with a sudden onset of high-grade fever, chills and severe fatigue which led to immediate hospitalization. He was diagnosed with sepsis due to *Escherichia coli* infection with concomitant bacterial prostatitis. Following this illness, he continued to have multiple health issues afterwards. In early 2025, he had an abnormal cardiac stress test which showed moderate-to-severe stenosis of his LAD artery. The patient developed extreme fatigue, painful urination and weight loss of about 4.5 kg upon initiation of statins. Around September 2025, he woke up with an idiopathic allergic reaction which caused hives and swelling all over his body. The following morning, he suddenly passed out multiple times and presented to the emergency room (ER). He was diagnosed with vasovagal syncope secondary to a viral infection or allergic reaction.

He reported no known drug allergies, no family history of autoimmune disease, and no prior history of gastrointestinal complaints. His lifestyle was characterized by high physical activity, a structured diet, and minimal stress until the onset of these events (Table 1).

Table 1: Summary of past medical history, visits and interventions

Date	Summary of Visits and Interventions
April 2024	Initial crisis: Emergency hospitalization for sepsis triggered by *E. coli* infection with concurrent acute bacterial prostatitis Presenting features: high fever and profound fatigue
Early 2025	Cardiac evaluation: Abnormal stress test identified moderate-to-severe stenosis of the LAD artery. Initiated statin therapy, resulting in debilitating fatigue, urinary discomfort, and unintended weight loss of ~4.5 kg.
September 2025	Allergic and syncopal crisis: Sudden onset of allergic reaction with hives and swelling in the body, followed by multiple vasovagal syncopal episodes. Emergency room diagnosis: vasovagal syncope, likely triggered by allergic/viral stimulus.
October 2025	Functional nutrition consultation at ThriveTribe Wellness Solutions Private Limited, Pune, India. GI-MAP and comprehensive blood tests ordered. Root cause analysis initiated. GI-MAP findings: Calprotectin (↑), Zonulin (↑), Pancreatic Elastase-1 (↓), Steatocrit (↑), *H. pylori* (↑), *Candida spp*. (↑), *Staphylococcus aureus* (↑), *Enterococcus faecalis* (↑) Blood panel: hs-CRP (↑), Homocysteine (↑), Vitamin D (↓), HDL cholesterol (↓), TSH and FT4 (borderline). Interventions initiated: Low-histamine and anti-inflammatory diet; targeted nutraceuticals; circadian rhythm reset.
Oct 2025-Feb 2026	Phased intervention program: Phase 1: Dietary overhaul (low-histamine and anti-inflammatory diet, elimination of gluten, dairy, refined sugar, and seed oils) Phase 2: 4-day structured detoxification Phase 3: Targeted supplementation (introduced sequentially) Phase 4: Lifestyle and circadian reset protocol
February 2026	Follow-up GI-MAP and blood panel assessment: Calprotectin: 935 → 1 µg/g; Zonulin: 163.5 → 75.8 ng/g; *H. pylori* reduced; *Candida spp*., *S. aureus, E. faecalis*: cleared; hs-CRP: 9.02 → 0.4 mg/L; Homocysteine: 15.9 → 8.3 µmol/L; Vitamin D: 37 → 56 ng/mL Symptomatic resolution: No recurrence of allergic reaction, vasovagal syncope, or infective episodes. Energy levels markedly improved. Weight stabilized with structured dietary protocol
Final Outcome	1. Massive reduction in intestinal inflammation (Calprotectin: 935 → 1µg/g) 2. Leaky gut resolved (Zonulin: 163.5 → 75.8 ng/g) 3. Complete elimination of yeast overgrowth and opportunistic bacteria 4. Systemic inflammation normalized (hs-CRP: 9.02 → 0.4 mg/L) 5. Homocysteine normalized (15.9 → 8.3 µmol/L) 6. Thyroid function normalized (TSH: 2.8 → 1.96 µIU/mL; FT4: 1.11 → 1.26 ng/dL) 7. Symptomatic remission across all presenting complaints

ROOT CAUSE ANALYSIS AND DIAGNOSTIC FINDINGS

In an effort to better understand potential contributing factors in his multi-system disease process, we ordered stool analysis utilizing GI-MAP based on qPCR technology and a comprehensive blood panel assessment.

GI-MAP Analysis: Markers of intestinal inflammation revealed an extremely inflamed gastrointestinal mucosa with calprotectin at 935 µg/g (<173 µg/g is optimal), and a leaky gut with a suboptimally high zonulin of 163.5 ng/g (<175 ng/g is optimal). Furthermore, pancreatic elastase-1 was found to be low at 193 µg/g (optimal: >200 µg/g), indicating impaired exocrine pancreatic function, whereas steatocrit was high at 20% (optimal: <15%), confirming fat malabsorption. Pathogenic overgrowth was also observed with *H. pylori* (3.32e3), *Candida spp*. (9.27e4), *S. aureus* (8.06e2), *Enterococcus faecalis* (7.90e4), *Enterobacter spp.* (8.32e7) being extremely higher in abundance than normal (Table 2).

Blood Panel Assessment: High-sensitivity C-reactive protein (hs-CRP) was critically high at 9.02 mg/L (optimal: <1 mg/L) and homocysteine was elevated at 15.9 µmol/L (optimal: 5-9 µmol/L), further supporting systemic inflammatory load. Additionally, both vitamin D and HDL cholesterol were below the optimal requirement at 37 ng/mL

and 40 mg/dL, respectively. Thyroid Stimulating Hormone (TSH) was slightly elevated at 2.8 µIU/mL. The eosinophil percentage was also found to be high at 3.1, which may be due to an allergic or parasitic reaction (Table 3).

Table 2. GI-MAP Results: Baseline and Post-Intervention

Biomarker	Baseline	Post-Intervention	Inference
Calprotectin (µg/g)	935 (High)	1 (Normal)	Massive reduction in intestinal inflammation
Zonulin (ng/g)	163.5 (Suboptimally High)	75.8 (Normal)	Leaky gut resolved
Steatocrit (%)	20 (High)	<dl (Normal)	Fat malabsorption resolved
Pancreatic Elastase-1 (µg/g)	193 (Low)	231 (Normal)	Digestive function of pancreas restored
H. pylori	3.32e3 (High)	1.66e3 (Improved)	Pathogen burden significantly reduced
Candida spp.	9.27e4 (High)	<dl (Normal)	Yeast overgrowth completely eradicated
Staphylococcus aureus	8.06e2 (High)	<dl (Normal)	Opportunistic bacteria cleared
Enterococcus faecalis	7.90e4 (High)	<dl (Normal)	Overgrowth completely cleared
Enterobacter spp.	8.32e7 (High)	3.94e7 (Improved)	Intestinal inflammatory activity reduced

Table 3. Serum Blood Panel Analysis: Baseline and Post-Intervention

Parameter	Baseline	Post-Intervention	Optimal Range	Status
Haemoglobin (g/dL)	14.2	14.6	14.5-16	Fixed
RDW (%)	13.2	13.1	<13	Improved
Eosinophils (%)	3.1	1.2	<3	Fixed
hs-CRP (mg/L)	9.02	0.4	<1	Fixed
Homocysteine (µmol/L)	15.9	8.3	5-9	Fixed
Ferritin (ng/mL)	232	179	75-150	Improved
Vitamin D-25(OH) (ng/mL)	37	56	50-60	Fixed
Fasting Glucose (mg/dL)	73	80	82-88	Improved
HbA1c (%)	5.8	5.4	5.0-5.3	Improved
HDL Cholesterol (mg/dL)	40	53	55-75	Improved
Albumin (g/dL)	4.2	4.6	4.5-5.0	Fixed
Albumin/Globulin Ratio	1.75	2.0	1.8-2.0	Fixed
FT4 (ng/dL)	1.11	1.26	1.16-1.78	Fixed
TSH (µIU/mL)	2.8	1.96	0.5-2.5	Fixed
Transferrin Saturation (%)	41	33	30-40	Fixed

Abbreviations: FT4, Free Thyroxine; HbA1c, Haemoglobin A1c; HDL, High-density lipoprotein; hs-CRP, High-sensitivity C-reactive protein; RDW, Red blood cell distribution width; TSH, Thyroid-stimulating hormone.

INTERVENTION

Root cause analysis of his multi-system illness led to the development of a phased, personalized ALIVE protocol. The intervention consisted of four consecutive phases: dietary protocol and symptom management, structured detoxification, targeted nutraceutical supplementation and lifestyle as well as circadian reset.

Phase 1: Dietary Protocol and Symptom Management

To immediately address allergic reactions, including hives and swelling, alongside vasovagal syncope episodes, a strict low-histamine, anti-inflammatory diet was instituted. We removed all the major triggers for inflammation such as gluten, dairy, refined sugar, processed foods and refined seed oils. In order to reduce gut and systemic inflammation, daily anti-

inflammatory shots comprising Indian gooseberry (amla), ginger, turmeric, cucumber, curry leaves and Himalayan pink salt were introduced. The diet mainly focused on whole-food sources of protein, healthy fats like ghee and cold-pressed oils as well as avocado, vegetables low in histamine, and moderate amounts of fermentable carbohydrates (Table 4).

Table 4. Customized Low-Histamine Anti-Inflammatory Diet Protocol

Meal Timing	Components of Meals
Empty Stomach	50 mL anti-inflammatory shot: 2 Indian gooseberry + ½-1 cucumber + 1-inch ginger + ½ tsp turmeric powder + 5-6 curry leaves + ½ tsp Himalayan pink salt + ½ tsp roasted cumin powder + ½ tsp black pepper powder + 1-1.5 cups water (blended)
Breakfast	Option 1: 2-3 scrambled vegetable eggs in ghee + ½ avocado/guacamole Option 2: 2 medium dal or bottle gourd dosa with thick vegetable sambar + 2 tsp coconut chutney Option 3: 1 bowl egg salad (2-3 eggs) with avocado oil + mint dressing
Snack (optional)	Fruit smoothie: 1 seasonal fruit + ½ cup coconut milk + 1 tsp ghee/coconut oil + water
Lunch	Option 1: 150 g chicken (curry/sautéed/tikka, cooked in ghee) + 1 medium bowl salad + 1–1½ portions of millet/oats/quinoa/rice/jowar Option 2: Bottle gourd oats pulao in ghee + 150 g chicken tikka Option 3: Masoor dal khichadi with bottle gourd and carrot + 2 boiled eggs Mandatory: 2 raw black garlic pods
Post-Lunch/Evening	1 bowl chicken soup or lentil soup + 1 small bowl sweet potato chaat with ghee and coconut shavings
Dinner	Option 1: 2 medium millet roti with ghee + 150 g chicken curry + cucumber salad Option 2: 1-1½ bowl rice with egg curry (2 eggs/150 g) + lightly dressed salad Option 3: 150 g methi chicken in ghee + oats veggie pulao

Phase 2: Structured Detoxification

A 4-day detox protocol was implemented for the patient to help eliminate pathogenic growth and support his liver and kidneys. The preparatory phase mainly comprised a regular diet along with drinking lemon water, coconut water, chicory and dandelion tea, rooibos tea, and supplements like detox binder (iThrive Essentials, India), glutathione (Codeage, USA), psyllium husk (Organic India) and probiotics (iThrive Essentials, India) at different times of the day as instructed. During the active detox phase (Days 1-3), the patient was advised to consume "liver rescue smoothies" (prepared from bananas, frozen blueberries and dragon fruits), detox soup (prepared from sprouted mung beans, coconut oil, cumin, fennel, ginger, garlic) and grilled chicken or chicken broth in place of meals. The supplements provided in the active detox phase continued. On day 4, the patient was instructed to consume only fluids, including diluted carrot/pineapple juice, lemon-honey water, and coconut water, to help draw out toxins stored deep within the cells (Table 5). At the same time, increased sweating through saunas was also recommended for detoxification.

Table 5. Detox Protocol: Preparatory Phase and Active Detox Phase

Time of the Day	Meal and Supplements
Preparatory Phase	
Upon Waking	2 Detox Binder capsules with 1 glass of water
After 30 min	1 glass lemon water + 1 cup chicory and dandelion tea
Breakfast	Regular diet protocol + 1 Glutathione capsule
Mid-morning	1 glass coconut water + 1 seasonal fruit
Lunch	1 probiotic tablet 15 min before meal + regular lunch + 1 Glutathione capsule
Dinner	Regular dinner protocol
7:30–8:00 PM	1 glass lemon water + 1 cup rooibos tea + 1 tsp psyllium husk in water
Active Detox Phase - Days 1-3	

Upon Waking	2 Detox Binder capsules + 1 glass water
After 30 min	1 glass of lemon water + 1 cup chicory and dandelion tea
Breakfast	Liver rescue smoothie (1 banana + 1 cup frozen blueberries + 1 dragon fruit + ½ cup water) + 2-3 eggs or moong dal cheela + 1 Glutathione capsule
Mid-morning	1 glass coconut water + malai / 1 seasonal fruit
Lunch	1 probiotic tablet 15 min before meal + detox soup (sprouted mung beans, coconut oil, fennel, cumin, ginger, garlic) + 150-160 g grilled chicken or chicken soup + 1 Glutathione capsule
Dinner	Detox soup + 150-160 g grilled chicken/broth + tricolor sprouts salad
7:30–8:00 PM	1 glass lemon water + 1 cup rooibos tea + 1 tsp psyllium husk in water
Active Detox Phase - Day 4	
All Day	4 glasses diluted carrot/pineapple juice (mildly sweet) + 1 Glutathione capsule; 3 glasses lemon-honey water; 2 glasses coconut water; 1 glass lemon water + rooibos tea + psyllium husk at 7:30-8:00 PM.

Phase 3: Targeted Nutraceutical Supplementation

Supplements were given sequentially to test tolerance of each one of them and to get the maximum therapeutic effect. The supplement protocol was aimed at gut healing, pathogen eradication, immune reconstitution, detoxification support, anti-inflammatory activity and histamine modulation (Table 6).

Table 6. Targeted Nutraceutical Supplementation Protocol

Supplement	Brand	Dosage and Timing	Purpose
Magnesium Bisglycinate	iThrive Essentials, India	½ scoop in water, on an empty stomach	Muscle relaxation, sleep quality, stress reduction
Vitamin D3 + K2	iThrive Essentials, India	1 capsule after breakfast	Bone health, hormone balance, immune function
B Complex	iThrive Essentials, India	1 capsule before lunch	Energy metabolism, nerve function
Omega-3	Doctor's Best, USA	1 capsule with lunch + 1 after lunch	Anti-inflammatory, cardiac and neural support
Amino Complex	Thorne, USA	1 scoop in water after breakfast	Muscle repair and recovery
Zinc	iThrive Essentials, India	1 capsule 2 h after meal (between lunch and dinner)	Immune function, gut healing
Immune Support	iThrive Essentials, India	2 capsules with lunch + 2 capsules with dinner	Enhanced immunity, infection risk reduction
Detox Binder	iThrive Essentials, India	2 capsules on an empty stomach + 2 capsules 2 h after meal	Toxin binding, liver/gut detoxification
Saccharomyces boulardii	Now Foods, USA	2 capsules 15 min before food	Microbiome restoration, gut repair
Liposomal Glutathione	Codeage, USA	1 capsule with each meal (3 times a day)	Antioxidant, cellular detoxification
Digestive Enzymes	Doctor's Best, USA	1 capsule on an empty stomach + 1 before lunch + 1 with lunch	Improved digestion and nutrient absorption
Candidase	Enzymedica, USA	2 capsules 1 h before meal/empty stomach	Eradication of yeast/fungal overgrowth
Probiotics	iThrive Essentials, India	1 tablet 15 min before food	Re-establishment of commensal gut bacteria
Homocysteine Nutrients	Seeking Health, USA	1 capsule after breakfast	Homocysteine regulation, adrenal support
HistaminX	Seeking Health, USA	1 capsule after breakfast + 1 capsule after lunch	Histamine degradation, allergy symptom reduction

Phase 4: Lifestyle and Circadian Reset

A comprehensive lifestyle modification program was designed to control cortisol rhythm and to restore the balance of the autonomic nervous system. The patient was instructed to get 15 minutes of morning sun exposure and to ground himself barefoot before screen time. To protect the sacred

sleep window from 10:00 pm to 2:00 am, evening blue-light hygiene was enforced through the installation of blue-light filters on all devices, transition to warm yellow lighting at home, and screen restriction after 9:00 pm. Alternate nostril pranayama and breathing exercises were also encouraged for activation of the parasympathetic nervous system. In order to prevent any future pathogen exposure, the patient was strictly advised to clean leafy greens and fruits with grapeseed oil and activated charcoal, respectively, before consumption.

RESULTS

At the end of the three-month-long functional nutrition program, post-protocol analysis of the results depicted in blood work and GI-MAP revealed substantial clinical and biochemical improvement in almost all areas tested. Calprotectin improved from 935 µg/g to 1 µg/g as shown on GI-MAP analysis, demonstrating resolution of intestinal inflammation. Zonulin normalized from 163.5 ng/g to 75.8 ng/g, which indicated resolution of intestinal hyperpermeability. *Candida spp*., *S. aureus*, and *Enterococcus faecalis* were completely eliminated, with a major reduction in the abundance of *H. pylori*. Pancreatic elastase-1 improved from 193 to 231 µg/g, consistent with normalization of pancreatic exocrine function. Fat malabsorption resolved as evidenced by steatocrit dropping below detectable levels (Table 2).

Blood panel results confirmed normalization of systemic inflammation in the body as hs-CRP dropped significantly from 9.02 to 0.4 mg/ L. Homocysteine levels were also improving, going from 15.9 to 8.3 µmol/ L. Vitamin D levels increased from 37 to 56 ng/mL. Thyroid hormones were optimized with TSH going from 2.8 to 1.96 µIU/ mL and FT4 increasing from 1.11 to 1.26 ng/dL. Besides, HDL cholesterol went from 40 to 53 mg/dL. Albumin levels improved too, from 4.2 to 4.6 g/dL, and HbA1c dropped from 5.8 to 5.4%. (Table 3)

Thus, at the end of the functional nutrition intervention program, the patient experienced a remarkable health transformation with his consistent approach. He reported complete resolution of allergic reactions including full-body hives, and no recurrence of infections. He was relieved from vasovagal syncope and fatigue, while restoring his exercise capacity. A proper maintenance diet was prepared for the patient providing 2475 kcal/day balanced with 84 g protein to support muscle mass retention and metabolic stability. This approach prevented him from unintentional weight loss that he experienced previously. The patient witnessed notable improvements in key metabolic, endocrine and inflammatory biomarkers by incorporating consistent sleep hygiene, nervous system regulation and a healthy lifestyle.

DISCUSSION

Increased intestinal permeability is a common characteristic of gut dysbiosis. A high number of invading bacteria activates toll-like receptors (TLRs), which results in the overexpression of inflammatory cytokines, thereby leading to epithelial damage and chronic inflammation (2). In this case, the high fecal calprotectin, an important biomarker for infections and inflammation, can be attributed to the patient's increased hs-CRP levels (11). A similar conclusion is also found in the study conducted by Anindita *et al.,* in patients with colitis, citing a significant association between fecal calprotectin and CRP (12). Zonulin, the principal regulator of tight junctions between intestinal epithelial cells, was found to be elevated in the patient, confirming intestinal hyperpermeability. This causes many antigens to bypass the blood-gut barrier, activate the immune system and develop endotoxemia, which possibly explains the reason behind the patient's recurrent sepsis, since a compromised intestinal barrier can act as both a pathogen reservoir and a point of entry (13,14). In addition, the patient was also diagnosed with acute bacterial prostatitis which is usually associated with bladder outlet obstruction or an

immunocompromised state (15). Gut dysbiosis is considered one of the major factors in the development of cardiovascular diseases through the production of trimethylamine N-oxide (TMAO) and endotoxin-driven inflammation (6,16). A meta-analysis showed an evidence-based relationship between *H. pylori* seropositivity and increased risk of coronary heart disease (17). Even vitamin B12 deficiency and hyperhomocysteinemia are associated with cardiovascular risk factors in Indian patients with coronary artery disease (18). Hence, LAD artery stenosis in the patient could be due to dysbiosis, high homocysteine levels, and/or *H. pylori* infection. Without any known identifiable trigger, a sudden allergic reaction with hives and swelling in the patient's body is increasingly linked to gut dysbiosis and infections (19). Vasovagal syncope in the setting of an allergic reaction is mechanistically tied to autonomic imbalance and vagal hypersensitivity. The vagus nerve's cholinergic anti-inflammatory pathways link gut-derived inflammation to impaired vagal tone and increased susceptibility to autonomic dysregulation (20,21). Low pancreatic elastase-1 and high steatocrit depict exocrine pancreatic insufficiency which is bidirectionally linked to dysbiosis since decreased enzymatic breakdown of proteins or lipids favours pathogenic overgrowth, while dysbiosis itself can affect pancreatic exocrine function (22,23). Vitamin D deficiency in the patient (37 ng/mL at baseline) is also relevant with respect to the context that vitamin D receptor signalling upregulates tight-junction proteins and supports mucosal immune tolerance. Its deficiency is associated with increased intestinal permeability (24). Supplementation with vitamin D3+K2 (iThrive Essentials, India) restored its levels to optimal (56 ng/mL) in the patient.

Antibiotics, statins, and antihistamines were used in conventional care to treat the patient's health problems; however, this did not result in remission and instead added iatrogenic harm, such as statin-induced fatigue and unintentional weight loss. On the other hand, all of the patient's major problems were simultaneously resolved by a functional nutrition approach guided by blood tests and advanced diagnostics. In patients with recurrent infections, unexplained allergic reactions, cardiovascular risks, and nervous system dysregulation, the current case supports the inclusion of gut microbiota assessment in diagnostic workups.

CONCLUSION

The case report demonstrates that severe gut dysbiosis and intestinal permeability can be the root cause of several seemingly unrelated multi-system conditions, including recurrent sepsis, moderate to severe stenosis, allergies and vasovagal syncope. Advanced diagnostic testing such as GI-MAP qPCR stool analysis and comprehensive blood panel assessment allowed for better characterization of these pathologies. Implementation of a phased functional nutrition intervention, including a low-histamine and anti-inflammatory diet, structured detoxification protocols, targeted supplementation and resetting the circadian rhythm, allowed to improve all clinical parameters and biomarkers within three months. Thus, functional nutrition can be used as an evidence-based, science-backed approach for addressing complex chronic diseases and treating multisystemic symptoms.

Declaration by Authors

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