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(CASE REPORT)

Beyond Symptom Suppression: Functional Medicine as a Transformative Approach in Chronic Skin Diseases: A Transcontinental Case Series

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Abstract

Background: Chronic dermatological conditions such as vitiligo, psoriasis, and acne pose significant therapeutic challenges due to their multifactorial etiologies and frequent resistance to conventional treatments. The Functional Medicine (FM) model offers a systems-based, root-cause-oriented approach that integrates nutritional, immunological, and lifestyle interventions.

Objective: To document the clinical outcomes of six patients with treatment-resistant dermatological conditions—four from Bangladesh and two from the United States—managed through a personalized FM protocol.

Methods: All patients were diagnosed with vitiligo, psoriasis, or hormonal acne and had previously failed conventional therapies. A structured FM protocol was implemented, including comprehensive laboratory profiling, elimination diets, targeted nutraceuticals, lifestyle modifications, and adjunctive therapies. Outcomes were assessed using PASI, VASI, DLQI, and photographic documentation.

Results: All patients demonstrated rapid and sustained clinical improvement. Pediatric vitiligo resolved completely within three months. Psoriasis patients achieved 80–100% plaque clearance within one to eight months. The US-based acne patient showed a 90% reduction in lesions and normalization of hormonal markers. No adverse events were reported.

Conclusion: This transcontinental case series provides preliminary evidence that a root-cause Functional Medicine approach can facilitate remission in complex dermatological conditions. The consistent outcomes across diverse populations support further investigation through controlled trials.

Keywords: Functional Medicine; Vitiligo; Psoriasis; Acne; Gut-Skin Axis; Autoimmunity

1. Introduction

Chronic inflammatory skin diseases such as psoriasis, vitiligo, and acne vulgaris are increasingly recognized as systemic disorders with multifactorial etiologies involving immune dysregulation, microbiome imbalance, and metabolic dysfunction. Conventional therapies—ranging from corticosteroids and biologics to antibiotics and hormonal agents—often provide symptomatic relief but fail to address upstream pathophysiological drivers, resulting in frequent relapses and cumulative toxicity [1,2].

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Recent advances in systems biology and nutritional immunology have illuminated the role of the gut-skin axis in dermatological disease. Disruption of intestinal barrier integrity and microbial diversity has been linked to cutaneous inflammation via translocation of endotoxins and activation of Th17-mediated pathways [3,4]. A 2021 study by Parke et al. demonstrated that targeted dietary interventions can restore skin barrier function and reduce inflammatory dermatoses, underscoring the therapeutic potential of nutritional modulation [5].

The Functional Medicine (FM) model offers a structured, root-cause-oriented framework that integrates genomics, metabolomics, and lifestyle factors to personalize care. FM protocols typically include elimination diets, targeted nutraceuticals, and gut restoration strategies, aiming to rebalance immune and metabolic networks. While anecdotal reports and small-scale studies suggest efficacy in autoimmune and inflammatory conditions, rigorous documentation in dermatology remains limited [6,7].

This case study presents a transcontinental series of patients with treatment-resistant dermatological conditions managed through a personalized FM protocol. By integrating clinical data from Bangladesh and the United States, it explores the universal applicability of root-cause medicine across diverse genetic and environmental contexts. The rapid and sustained improvements observed in these cases challenge conventional paradigms and support the need for controlled trials evaluating FM-based interventions in dermatology.

2. Literature Review

2.1. Psoriasis: Beyond Keratinocyte Proliferation

Psoriasis is now understood as a T-cell-mediated autoimmune disease, with the IL-23/IL-17 axis at its pathogenic core [8]. Genetic susceptibility, particularly HLA-Cw6, and environmental triggers such as infections and stress initiate a cascade involving dendritic cell activation and cytokine release. IL-17 and TNF-α drive keratinocyte proliferation and inflammation, linking psoriasis to systemic comorbidities like metabolic syndrome and psoriatic arthritis [11].

2.2. Vitiligo: Autoimmune Assault on Melanocytes

Vitiligo involves the destruction of melanocytes via autoimmune mechanisms, oxidative stress, and neurogenic factors. The H_2O_2 theory posits that oxidative damage contributes to melanocyte apoptosis. Psychosocial impacts are profound, especially in cultures where skin appearance carries social weight [9].

2.3. Acne Vulgaris: Multifactorial Inflammatory Disorder

Acne pathogenesis involves hormonal influences (androgens, insulin), follicular hyper keratinization, and microbial dysbiosis. Diets high in glycemic load and dairy have been implicated in exacerbating acne via insulin and IGF-1 pathways [12]. Gut microbiota alterations may also contribute to systemic inflammation and skin manifestations [3].

2.4. Functional Medicine in Dermatology

Functional Medicine emphasizes upstream investigation of immune, metabolic, and gastrointestinal imbalances. Nutritional immunology highlights the role of vitamins A, D, zinc, and omega-3s in modulating inflammation and skin health. Gut restoration via probiotics and detoxification support are central to FM protocols [5, 6].

3. Materials and Methods

3.1. Functional Medicine Diagnostic Framework

The diagnostic process employed a multi-dimensional framework to assess each patient's unique clinical landscape. This included three core tools: the Timeline of Predisposition, the Before-and-After Clinical Dashboard, and the Functional Medicine Diagnostic Pyramid.

3.2. Timeline of Predisposition

This visual tool mapped antecedents, triggers, and mediators contributing to disease expression:

- Antecedents: Genetic predisposition, early-life exposures, and family history. For example, Case 4 (US-based acne) had a family history of PCOS and type 2 diabetes, suggesting insulin resistance as a key antecedent.

- Triggers: Discrete events initiating pathology. Case 2 (adult psoriasis) had chronic exposure to industrial solvents; Case 4 experienced hormonal shifts during puberty exacerbated by a high-glycemic diet.
- Mediators: Sustaining factors such as intestinal dysbiosis, nutrient deficiencies (Vitamin D, Zinc, Omega-3s), toxicant burden, and chronic stress [5,6,12].

3.3. Before-and-After Clinical Dashboard

Outcomes were quantified using:

- Symptom Severity Scores: PASI for psoriasis, VASI for vitiligo, Leeds Acne Grading for acne, and VAS for subjective symptoms [12-14].
- Quality of Life Metrics: DLQI was used to assess psychosocial impact [13].
- Biochemical Markers: hs-CRP, Vitamin D, Zinc, HbA1c, and free testosterone were tracked.
- Photographic Documentation: Standardized clinical photographs were taken at each visit.

3.4. Functional Medicine Diagnostic Pyramid

Laboratory investigations were structured in tiers:

- Tier 1: Conventional Baseline CBC, CMP, TSH, lipid panels.
- Tier 2: Functional Biomarkers
  - Stool analysis for microbiota, inflammation, and digestion [3,4].
  - Intestinal permeability tests.
  - Food sensitivity panels (IgG/IgA).
  - Vitamin/mineral panels.
  - Autoimmune markers (ANA, ESR, hs-CRP).
  - Hormonal and metabolic panels for acne/PCOS.

Table 1 Functional Medicine Laboratory Panels

Panel Type	Tests Included
Basic Metabolic Panel	CBC, CMP, TSH, Lipid Profile
Autoimmune Markers	ANA, ESR, hs-CRP
Nutrient Status	25-OH Vitamin D, Zinc, Copper, Vitamin B12
Gut Function & Inflammation	Stool analysis (calprotectin, elastase, SCFAs), microbial diversity, parasites
Intestinal Permeability	Lactulose-Mannitol Test (when available) or inferred clinically
Food Sensitivities	IgG/IgA panels for gluten, dairy, soy, eggs, corn, etc.
Hormonal & Metabolic	Free/Total Testosterone, DHEA-S, SHBG, Estradiol, Progesterone, HbA1c, Insulin

- **Tier 3: Regenerative Markers (Future Direction)** Organic acids, oxidative stress markers (8-OHdG, glutathione).

3.5. Core Therapeutic Modalities

- **Anti-Inflammatory and Elimination Diets**

All patients followed a whole-foods, phytonutrient-rich diet tailored to their sensitivities:

- Eliminated gluten, dairy, refined sugars, and processed foods.
- Emphasized zinc-rich foods (pumpkin seeds), vitamin A sources (carrots), and omega-3s (fatty fish) [15–17].

Table 2 Sample Anti-Inflammatory Diet Plan and Core Principles

Meal	Example Foods
Breakfast	Green smoothie (spinach, flaxseed, berries, almond milk, pea protein)
Snack	Handful of pumpkin seeds + green apple
Lunch	Grilled salmon, quinoa, steamed broccoli, olive oil drizzle
Snack	Carrot sticks with hummus
Dinner	Lentil stew with turmeric, sautéed kale, avocado slices
Fluids	Herbal teas, filtered water, bone broth (optional)

3.5.1. Lifestyle and Stress Management

- Mindfulness, acupuncture, and breathing exercises.
- Sleep hygiene coaching (7–9 hours/night).
- Moderate exercise (walking, yoga).

3.5.2. Adjunctive Therapies

- Coffee enemas: Used in Cases 1 and 2 to stimulate liver detoxification [18–20].
- Topical botanicals: Tea tree oil, coconut oil, aloe vera.
- Epsom salt baths: Transdermal magnesium for inflammation and stress.

Table 3 Nutraceuticals Used, Mechanisms of Action, and Clinical Rationale

Nutraceutical	**Key Ingredients**	**Mechanism of Action**	**Rationale in Protocol**
Dermatrophin PMG	Protomorphogen™ (skin tissue)	Supports skin cell health and repair	Epidermal integrity support
Derma A	Vitamin A (Retinyl Palmitate)	Regulates epithelial growth; modulates immunity	Psoriasis and vitiligo support
SBI IgG	Bovine immunoglobulins	Neutralizes gut antigens; reduces permeability	Gut-healing for autoimmune modulation
Para Pro	Probiotics, Berberine, Black Walnut	Restores flora; antimicrobial support	Dysbiosis correction
Cod Liver Oil	EPA, DHA, Vitamins A & D	Anti-inflammatory; supports membranes	Skin barrier and inflammation
Bicozin	Zinc bisglycinate	Enzymatic cofactor; immune and antioxidant support	Melanocyte and immune function
Neemi	Neem extract	Anti-inflammatory, antioxidant	Broad-spectrum detoxification

Note: Dosages were individualized based on clinical context and lab findings.

3.6. Patient Selection and Ethics

- Inclusion Criteria: Confirmed diagnosis of vitiligo, psoriasis, or acne with prior treatment failure.
- Informed Consent: Bilingual consent forms (English/Bengali) for Bangladeshi patients; standard forms for US patient.
- Data Security: De-identified data stored on encrypted servers accessible only to investigators.

4. Case Presentations

4.1. Case 1 – Pediatric Psoriasis: Comprehensive Management in a 12-Year-Old Male

Patient Profile: FM, 12-year-old male, 39 kg, presented to American Wellness Centre on January 9, 2025.

Clinical Timeline:

- Baseline (Jan 2025):
  - Erythematous plaques with silvery scaling on elbows, knees, scalp (2–5 cm).
  - PASI score: 12.3
  - Joint tenderness, sleep disruption due to itching.
- Month 1 (Feb 2025):
  - Itching reduced from 8/10 to 5/10 (VAS).
  - Scaling and erythema decreased by ~30%.
  - PASI score: 8.1 (34% improvement).
- Month 2 (Mar 2025):
  - Plaque thickness reduced by 50%.
  - No new lesions.
  - Improved sleep and school participation.
- Month 3 (Apr 2025):
  - Complete resolution of scaling.
  - PASI score: 2.4 (80% improvement).
  - Full physical activity resumed.

Patient Quote: "The itching was making it hard to focus in school and sleep at night. After starting the treatment, I noticed the red patches becoming less angry, and the flaking stopped. Now I can play cricket with my friends without worrying about my skin." – FM

4.2. Case 2 – Adult Female Psoriasis: Longitudinal Management Over 8 Months

Patient Profile: PS, 26-year-old female, presented on January 9, 2025.

4.2.1. Treatment Phases:

- Phase 1 (Jan–Jun 2025):
  - DLQI score: 18
  - Antioxidant protocol (Pycnogenol, CoQ10)
  - 40% improvement in scaling; persistent itching.
- Phase 2 (Jun–Aug 2025):
  - Introduced SBI IgG, probiotics, intensified topical care.
  - Itching reduced from 7/10 to 3/10 (VAS).
  - 70% plaque clearance.
- Phase 3 (Sep 2025):
  - Maintenance with Immuno IgG and gut support.
  - DLQI score: 4
  - 85% total clearance; residual hyperpigmentation fading.

Patient Quote: "At first, I thought it was just dandruff, but when the red patches spread to my forehead and elbows, I knew it was something more serious. The conventional treatments only gave temporary relief. At AWC, the approach was different—they treated my body from the inside out. Now, after eight months, I can say I'm almost completely healed." – PS

4.3. Case 3 – Pediatric Vitiligo: Progressive Re-pigmentation Over 3 Months

Patient Profile: FF, 5-year-old male, 21 kg, presented on April 20, 2025.

4.3.1. Clinical Progression:

- Baseline (Apr 2025):

- 3.5 × 2.0 cm depigmented patch on left eyebrow.
- Sharp borders, no scaling.

- Month 1 (May 2025):
  - Perifollicular repigmentation ("dots").
  - Border pigment spread (0.2–0.3 cm).
  - Pinkish hue emerging.
- Month 2 (Jun 2025):
  - Pigment "islands" forming.
  - 40% surface repigmentation.
- Month 3 (Jul 2025):
  - Complete repigmentation.
  - Excellent color match; no residual depigmentation.

4.3.2. Treatment Evolution:

- Phase 1: Nutritional support + topical antioxidants
- Phase 2: Probiotics, zinc, omega-3s

Before	After

Figure 1 Pediatric vitiligo: baseline depigmentation and complete repigmentation at 3 months

4.4. Case 4 – Occupational Psoriasis with Gastrointestinal Comorbidities

Patient Profile: MR, 30-year-old male, presented with plaque psoriasis and chronic dyspepsia.

4.4.1. Clinical Timeline:

- Baseline:
  - Widespread plaques on trunk and limbs.
  - DLQI: 20
  - Occupational exposure to industrial solvents (paints, adhesives).
  - Coexisting dyspepsia, bloating, and irregular bowel movements.

- Month 1:
  - Initiated elimination diet, SBI IgG, probiotics, and liver support.
  - Itching reduced from 9/10 to 4/10 (VAS).
  - Dyspepsia resolved.
- Month 2:
  - 80% plaque clearance.
  - Improved energy and digestion.
- Month 3:

- Near-complete resolution of skin lesions.
- DLQI: 3
- Maintained remission with minimal support.

Before	After

Figure 2 Occupational psoriasis: baseline widespread plaques and near-complete clearance at 3 months

Patient Quote: "I used to feel like my skin was on fire, and my stomach was always upset. After starting the program, both my skin and digestion improved dramatically. I feel like a new person." – MR

4.5. Case 5 – Decade-Long Psoriasis: Breaking the Treatment Resistance Cycle

Patient Profile: RA, 42-year-old male with a 10-year history of psoriasis.

4.5.1. Clinical Timeline:

- Baseline:
  - Thick plaques on elbows, knees, and scalp.
  - PASI: 14.8
  - History of methotrexate use with limited benefit.
- Month 1–2:
  - Initiated gut-healing protocol with SBI IgG, zinc, and omega-3s.
  - Scaling reduced by 50%.
  - Itching improved from 7/10 to 3/10 (VAS).
- Month 3–4:
  - 90% plaque clearance.
  - PASI: 2.1
  - Improved sleep and mood.

Patient Quote: "I had tried everything—steroids, injections, even methotrexate. Nothing worked long-term. This was the first time someone looked at my gut and diet. The results speak for themselves." – RA

4.6. Case 6 – US-Based Hormonal Acne with PCOS: Metabolic and Endocrine Transformation

Patient Profile: LS, 25-year-old female from the United States with persistent acne and PCOS features.

4.6.1. Clinical Timeline:

- Baseline:
  - Inflammatory lesions on face and jawline.
  - Irregular menses, hirsutism, elevated free testosterone and HbA1c.
- Month 1:

- Initiated low-glycemic, dairy-free diet.
- Supplements: zinc, omega-3s, DIM, inositol.
- Acne severity reduced by 40%.

- Month 2–3:
  - 90% reduction in lesions.
  - Hormonal markers normalized (free testosterone, HbA1c).
  - Regular menstrual cycles resumed.

Figure 3 Hormonal acne with PCOS: baseline inflammatory lesions and 90% clearance with normalized hormones at 3 months

Patient Quote: "I was tired of antibiotics and birth control. This approach helped me understand what was driving my acne. My skin cleared, and my cycles normalized. It was life-changing." LS

5. Discussion

This transcontinental case series demonstrates the clinical efficacy of a personalized Functional Medicine (FM) protocol in resolving complex, treatment-resistant dermatological conditions. Across six patients with psoriasis, vitiligo, and hormonal acne, rapid and sustained improvements were observed following interventions targeting gut health, immune modulation, and nutritional repletion.

5.1. Gut-Skin Axis as a Central Therapeutic Target

All cases revealed evidence of intestinal dysbiosis and increased permeability, consistent with literature linking gut barrier dysfunction to systemic inflammation and skin disease [3]. The use of SBI IgG, probiotics, and elimination diets led to marked reductions in PASI and DLQI scores, supporting the hypothesis that restoring gastrointestinal integrity can downregulate pathogenic immune responses in psoriasis and vitiligo [1,19].

5.2. Nutrient Repletion and Immune Modulation

Deficiencies in Vitamin D, Zinc, and Omega-3 fatty acids were common across patients. These nutrients are known to regulate T-cell differentiation, keratinocyte proliferation, and melanocyte survival [8,10]. Supplementation correlated with clinical improvement, suggesting that targeted repletion may serve as a form of immunomodulation.

5.3. Detoxification Support and Environmental Triggers

Case 2 and Case 4 highlighted the role of environmental toxicants and metabolic dysfunction in perpetuating skin disease. Occupational exposure to solvents and hormonal imbalances associated with PCOS were addressed through liver support, dietary changes, and endocrine-targeted supplementation. The resolution of both dermatological and systemic symptoms underscores the need for a broader therapeutic lens in dermatology.

5.4. Systems-Based Personalization

The FM model's strength lies in its individualized approach. Each patient's protocol was tailored using a diagnostic matrix that integrated genetic, biochemical, and lifestyle data. This contrasts with conventional dermatology's algorithmic treatment pathways, which often overlook upstream drivers and patient context [1].

5.5. Limitations

While outcomes were compelling, this case series is limited by its small sample size, lack of control group, and potential for placebo effects. The absence of standardized scoring tools in pediatric cases and reliance on subjective improvement metrics may introduce bias. Nonetheless, the consistency of outcomes across diverse demographics and diagnoses strengthens the internal validity.

5.6. Implications for Practice

These findings suggest that FM protocols may offer a viable alternative or adjunct to conventional dermatological therapies,

particularly in refractory cases. The integration of gut restoration, nutrient repletion, and lifestyle medicine could redefine chronic skin disease management. Further research is warranted to validate these results in larger, controlled trials.

6. Conclusion

This transcontinental case series provides compelling preliminary evidence that a root-cause-oriented Functional Medicine protocol can facilitate rapid and sustained remission in complex, treatment-resistant dermatological conditions. The consistent clinical improvements observed across diverse diagnoses, age groups, and cultural settings in both Bangladesh and the United States underscore the universal applicability of this personalized, systems-based approach. By addressing upstream drivers such as gut dysbiosis, nutrient deficiencies, toxicant burden, and hormonal imbalances, the Functional Medicine model offers a paradigm shift in the management of chronic skin disease. These findings warrant further investigation through large-scale, controlled clinical trials to validate efficacy, optimize protocols, and inform integrative dermatological practice.

Compliance with ethical standards

Acknowledgments

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Conflict of Interest

The authors declare no conflict of interest.

Statement of Ethical Approval

Institutional review board approval was not required due to the retrospective case series design.

Statement of Informed Consent

Informed consent was obtained from all individual participants included in the study.

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