



Role of a Tailored Dietary Approach for Inflammatory Skin Disorders

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Background: Inflammatory skin disorders decrease an individual's quality of life, creating a physical, psychological, and social burden. Diet may influence clinical manifestations and optimize treatment outcomes. However, there is a lack of well-researched diet studies making it challenging to formulate evidence-based and real-world dietary approaches to manage skin disorders. Therefore, there is an essential need to study dietary factors that may provide preventive therapy and the potential to induce and maintain long-term remission of skin disorders.

Hypothesis: A tailored dietary approach based on the oligoantigenic diet principles and the in-vitro Leukocyte Activation Assay-MRT (LAA-MRT) will effectively relieve skin disorders-related symptoms.

Methods: The retrospective chart review of de-identified data included subjects with eczema (n=12), acne (n=3), hives (n=3), and parapsoriasis (n=2). Dietitians used the in-vitro LAA-MRT results to build the nutritionally balanced Lifestyle Eating and Performance (LEAP) program considering the individual's eating habits. The LAA-MRT was conducted using Sony EC 800 Dual-Mode Flow Cytometry Systems (Sony Biotechnology Inc.) by adding an aliquot of buffered diluted whole blood from each subject to wells containing 150 food and chemical antigens. After a predetermined incubation period at 37°C, a Lyse Test was performed to determine the specific volume of lysing needed to eliminate the red blood cells to characterize and quantify the volumetric change in each white blood cells (WBC) population. White blood cells reactivity was analyzed using LAA-MRT software to scale the degree of an adverse immune response to food and chemical antigens. A symptom survey was used to measure the severity and frequency of three domains of symptoms associated with skin disorders and quantified on a scale of 0-4. Descriptive statistics and linear mixed models (LMMs) were performed using IBM SPSS, Version 27.0. An independent Institutional Review Board (IRB) approved the study.

Results: The mean age was 52.1±13.0 years, body mass index (BMI) 26.1±6.7 kg/m², and 18 (90%) were female. The follow-up time of the intervention was 9.8±4.9 weeks. LMMs indicated a significant reduction in mean (SE) symptoms scores pre- versus post-intervention for each domain [skin (6.2±0.7 vs. 1.6±0.4, 95% CI 3.0-6.2, P<0.001); digestive (10.1±1.6 vs. 4.7±0.9, 95% CI 1.5-9.2, P=0.008); and emotional/mental (9.2±1.2 vs. 5.1±0.8, 95% CI 1.1-7.0, P=0.008)].

Conclusions: We investigated dietary factors that could provide therapy for skin disorders and aid in improving response to conventional treatment. A clinically effective tailored dietary approach provides possible directions of management for subjects with inflammatory skin disorders.

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BACKGROUND

- The skin is one of the most commonly implicated target organs in adverse food reactions.
- Inflammatory skin disorders decrease an individual's quality of life, creating a physical, psychological, and social burden.
- Diet may influence clinical manifestations and optimize treatment outcomes. However, there is a lack of well-researched diet studies making it challenging to formulate evidence-based and real-world dietary approaches to manage skin disorders.
- Furthermore, prior studies offered limited insight into understanding the role of individualized dietary modifications for clinical practice.
- Identifying provocative foods and chemicals that aggravate skin disorders is a difficult task for both patients and health care practitioners.
- Therefore, there is an essential need to study dietary factors that may provide preventive therapy and the potential to induce and maintain long-term remission of skin disorders.

HYPOTHESIS

- A tailored dietary approach based on the oligoantigenic diet principles and the in-vitro Leukocyte Activation Assay-MRT (LAA-MRT) will effectively relieve skin disorders-related symptoms.

METHODS

- The retrospective chart review of de-identified data included subjects with eczema (n=12), acne (n=3), hives (n=3), and parapsoriasis (n=2).
- Dietitians used the in-vitro LAA-MRT results to build the nutritionally balanced Lifestyle Eating and Performance (LEAP) program considering the individual's eating habits.

METHODS

- The LAA-MRT was conducted using Sony EC 800 Dual-Mode Flow Cytometry Systems (Sony Biotechnology Inc.) by adding an aliquot of buffered diluted whole blood from each subject to wells containing 150 food and chemical antigens.
- After a predetermined incubation period at 37°C, a Lyse Test was performed to determine the specific volume of lysing needed to eliminate the red blood cells to characterize and quantify the volumetric change in each white blood cells population.
- White blood cells reactivity was analyzed using LAA-MRT software to scale the degree of an adverse immune response to food and chemical antigens.
- A symptom survey was used to measure the severity and frequency of three domains of symptoms associated with skin disorders and quantified on a scale of 0-4.
- Descriptive statistics and linear mixed models (LMMs) were performed using IBM SPSS, Version 27.0.
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RESULTS

- The mean age was 52.1±13.0 years, body mass index (BMI) 26.1±6.7 kg/m², and 18 (90%) were female. The follow-up time of the intervention was 9.8±4.9 weeks.
- LMMs indicated a significant reduction in mean (SE) symptoms scores pre- versus post-intervention for each domain [skin (6.2±0.7 vs. 1.6±0.4, 95% CI 3.0–6.2, P<0.001); digestive (10.1±1.6 vs. 4.7±0.9, 95% CI 1.5–9.2, P=0.008); and emotional/mental (9.2±1.2 vs. 5.1±0.8, 95% CI 1.1–7.0, P=0.008)].

Table 1. Baseline Characteristics	N=20 M±SD
Gender (F) n (%)	18 (90)
Age (years)	52.1±13.0
BMI (kg/m ²)	26.1±6.7
Time follow-up (weeks)	9.8±4.9

Table 2. Measures Pre- and Post-Dietary Intervention			
Symptom Survey Score	Pre-LEAP program M±SE	Post-LEAP program M±SE	P-value
Skin	2.9±0.4	1.4±0.3	0.002
Digestive	12.4±1.2	5.3±0.9	<0.001
Emotional/mental	9.5±0.8	4.7±0.7	<0.001

CONCLUSION

- We investigated dietary factors that could provide therapy for skin disorders and aid in improving response to conventional treatment.
- Findings indicate that symptoms were significantly reduced where the trained dietitian implementing the LEAP program considered the clinical presentation, dietary patterns and diversity for a nutritionally balanced approach.
- The LEAP program based on the in-vitro LAA-MRT results shows possible directions of management and provides the basis for a more comprehensive understanding of clinical care for inflammatory skin disorders.
- Further prospective studies are required to determine the long-term benefits of the LEAP program.