A 12 Week Study Evaluating the Efficacy of a Novel Standardized Nutraceutical to Improve Acne and Skin Health

INTRODUCTION
Although acne is generally viewed as the result of a localized immune response at the pilosebaceous unit, it is a condition with multifactorial etiology. While conventional treatments have focused primarily on the four major pathogenic factors, nutraceuticals offer an alternative or complementary approach to address more systemic, intertwined mechanisms involved in acne pathogenesis. These include stress, diet, and metabolism, skin and gut microbiome, hormonal fluctuations, oxidative stress, and immune function. Therapies which target these mechanisms have gone largely unexplored as ways to address acne. Here, we present the results of a novel nutraceutical addressing these root causes in patients with non-cystic acne.

METHODS

Inclusion Criteria:
- Healthy women and men
- Age range 18-50
- All Fitzpatrick Skin Types
- Mild to moderate acne with Investigator’s Global Assessment (IGA) severity score of 2-3 with at least:
  - >3 inflammatory lesions
  - >5 non-inflammatory lesions
- Severe acne with IGA severity score of 4 with at least:
  - >5 inflammatory
  - >5 non-inflammatory lesions

Exclusion Criteria:
- Cystic acne
- Pregnant or breastfeeding
- Current use of any oral or topical medications for acne
- Isotretinoin <6 months
- Current use of immunosuppressive, biologics, or corticosteroids
- Current use of prescription testosterone or HRT, birth control <3 months prior to start therapy
- Having started, stopped or changed dose of medications/biologics
- Known reactivity and allergies to test materials
- Dormant dermatological disease on test
- Pregnant or breastfeeding

Clinic visits: at Baseline, Week 4, 8 and 12.

Wash Out Phase
- Oral and/or topical prescription wash out was 14 days
- Systemic medication (antibiotics, steroids) wash out was 30 days
- OTC retinol containing products and any other OTC acne products wash out was 14 days
- OTC acne products wash out was 14 days
- Subjects instructed to take 4 capsules per day of the nutraceutical for 12 weeks

Study Assessments
- FDA Investigator’s Global Assessment (IGA) of Acne Severity
- Inflammatory and non-inflammatory lesion counts
- Clinical grading (0-9 scale) of skin texture, skin smoothness, hyperpigmentation, redness, and acne marks (PHI/PIE)
- Bioinstrumentation: Tewameter, Sebumeter, and Corneometer
- Self-Assessment Questionnaire
- Statistical Analyses

RESULTS
51 subjects entered with 39 subjects completing the study (mean age = 31.5 ± 7.7 years, range = 19-48).

Subject demographics were female (67%), White/Caucasian (41%, 6:10 M:F ratio), Black (41%, 5:11 M:F ratio), and Asian (13%, 1:3 M:F ratio).

All Fitzpatrick Skin Types were represented.

Reasons for discontinuation were lost to follow-up/withdrawal (N=7), non-compliance (N=1), and adverse events (N=4). AEs deemed probably related to the product included headache, pain, malaise and nausea. AEs were not serious and all resolved.

51 subjects entered with 39 subjects completing the study (mean age = 31.5 ± 7.7 years, range = 19-48).

71% *
85% **
74% ***
85% **
77% **
80% **
80% ***
61% **
82% ***
87% ***
71% *
87% **
87% ***

85% showed significant improvements in IGA scores for acne severity at Week 12 compared to BL (p<0.001).

87% showed significant improvements in non-inflammatory lesion count by Week 12 compared to BL. (P<0.001)

69% showed significant improvements in inflammatory lesion count by Week 12 compared to BL. (P<0.001)

CONCLUSION
The paucity of scientific evidence and lack of clinical data on the efficacy of CAM, including nutraceuticals, have limited their recommendation for use in acne. This proof-of-concept study showed improvements in acne and skin parameters. Although more studies are needed, these results offer insight into the potential benefits of nutraceuticals addressing underlying mechanisms that up to now, have gone largely unexplored. Addressing root causes that contribute to a generalized inflammatory response leading to the development of acne may prove to be an important step in expanding our toolbox in providing more options for patients and improving skin health.

Cross Polarized images of Baseline and Week 12

Table 1. Clinical Grading of Skin Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>% Subjects Improved at 12 weeks</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Texture (Visual)</td>
<td>85%</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Skin Smoothness (Tactile)</td>
<td>85%</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Hyperpigmentation</td>
<td>67%</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Redness (Visual)</td>
<td>80%</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Acne Marks (PHI/PIE)</td>
<td>80%</td>
<td>p&lt;0.001</td>
</tr>
</tbody>
</table>

* 85% showed significant improvements in acne severity scores at Week 12 compared to BL (p<0.001).
** 71% showed significant improvements in inflammatory lesion counts.
*** 61% showed significant improvements in non-inflammatory lesion counts.

Table 2. Bioinstrumentation

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Baseline</th>
<th>Week 12</th>
<th>% Subjects Improved</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sebumeter</td>
<td>158.1</td>
<td>121.6</td>
<td>72%</td>
<td>p=0.002</td>
</tr>
<tr>
<td>Corneometer</td>
<td>35.0</td>
<td>42.7</td>
<td>74%</td>
<td>p=0.002</td>
</tr>
<tr>
<td>Tewameter</td>
<td>17.3</td>
<td>26.9</td>
<td>41%</td>
<td>NS</td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.01, ***p<0.001.

Table 3. Self-Assessment Questionnaire

<table>
<thead>
<tr>
<th>Select Acne Attributes</th>
<th>Week 4</th>
<th>Week 8</th>
<th>Week 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>My skin is clearer.</td>
<td>61%</td>
<td>82%***</td>
<td>87%***</td>
</tr>
<tr>
<td>I have less breakouts.</td>
<td>61%</td>
<td>82%***</td>
<td>77%**</td>
</tr>
<tr>
<td>My skin is less oily.</td>
<td>74%**</td>
<td>74%**</td>
<td>74%**</td>
</tr>
<tr>
<td>My acne has improved</td>
<td>71%*</td>
<td>87%***</td>
<td>87%***</td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.01, ***p<0.001.

CONFLICT OF INTEREST/DISCLOSURE: All authors are employed by Nutraceutical Wellness Inc.