

A Topical Antioxidant Serum Containing Silymarin Reduces Sebum Peroxidation and Improves Facial Acne

Stephen Lynch¹, Komal Patel¹, Brittany Lee¹, Hina Choudhary²

¹L'Oréal Research & Innovation, Clark, NJ USA

²SkinCeuticals, New York, NY USA

INTRODUCTION

A body of research suggests a connection between acne vulgaris and cutaneous lipid peroxidation (Figure 1).¹ Indeed, acneic skin is known to have higher levels of oxidative stress and lower levels of antioxidants than healthy skin.² Since there is evidence that certain antioxidants can help reduce lipid peroxidation, an opportunity exists for topical antioxidant treatment to help intervene in this pathogenesis. It is known that silymarin, a standardized extract from *Silybum marianum* (milk thistle) seeds has potent antioxidant properties.³ We have previously reported that a topical serum containing 0.5% silymarin, 15% vitamin C, 0.5% ferulic acid, and 0.5% salicylic acid was effective in preventing or reducing lipid peroxidation based on several methodologies.⁴ The current study evaluated the ability of this topical antioxidant serum to help reduce sebum peroxidation and improve facial acne and related aesthetic attributes when used over time.

METHODS

This single center, blinded clinical study was conducted over the course of 12 weeks on 56 subjects (46 females and 10 males) aged 18-48 (mean = 28) with Fitzpatrick skin type ranging from II-V who had oily skin with sebumeter measurements $\geq 120 \mu\text{g}/\text{cm}^2$. The enrolled subjects presented with mild-to-moderate acne, lack of clarity, skin tone unevenness, and post-inflammatory hyperpigmentation or erythema (PIH/PIE). Subjects applied the serum to the face once daily for the duration of the study in conjunction with a mild cleansing bar and sunscreen. Clinical grading, tolerance evaluations, sebumeter measurements, and subject self-assessments were conducted at baseline, and weeks 1, 4, 8, and 12. A randomized subset of the panel (N=30) had sebum sampled from the forehead by swabbing at baseline, week 4, and week 12 and analyzed for lipid content.

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Figure 1: The role of lipid oxidation in the acne cycle and opportunity for antioxidant intervention.

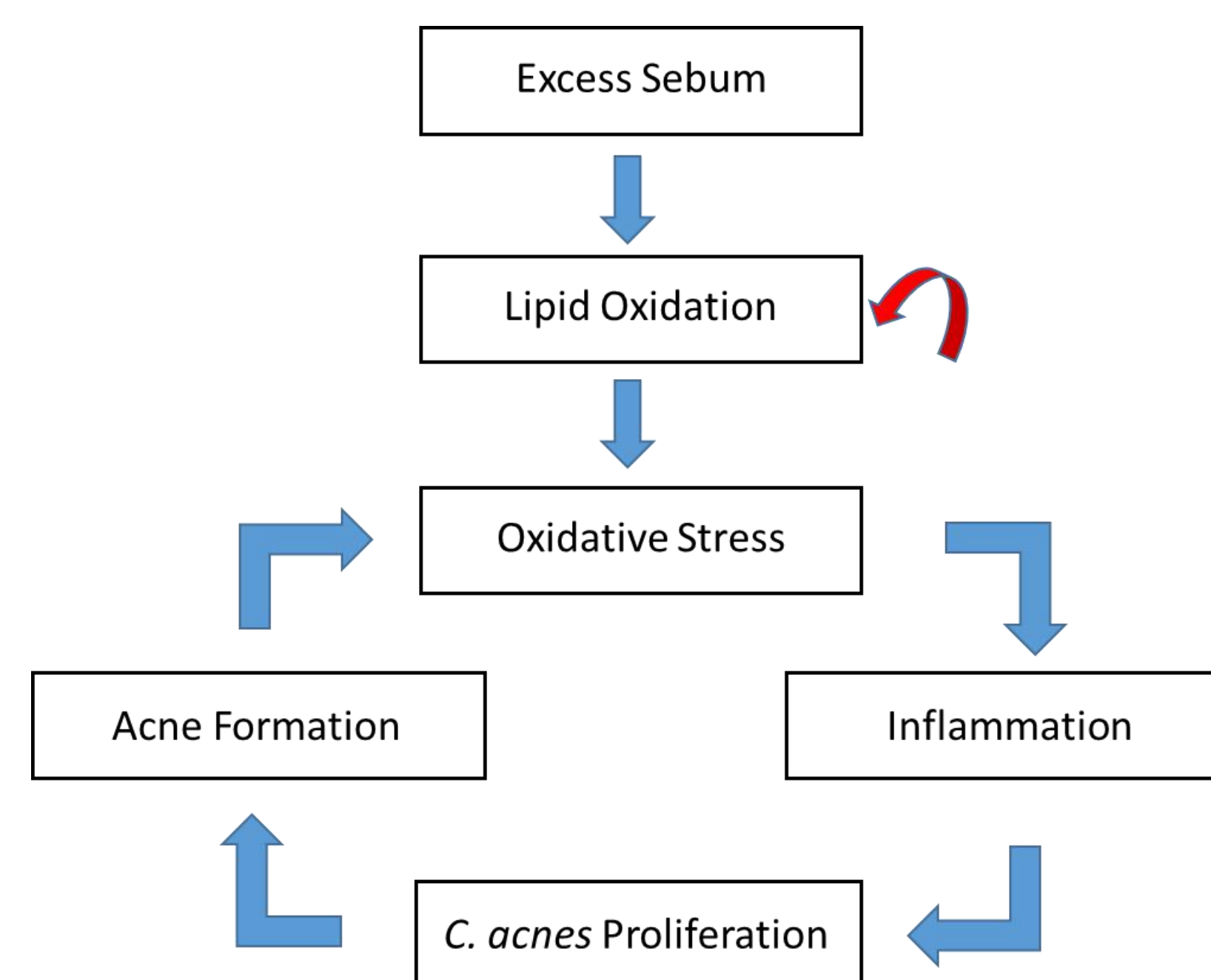
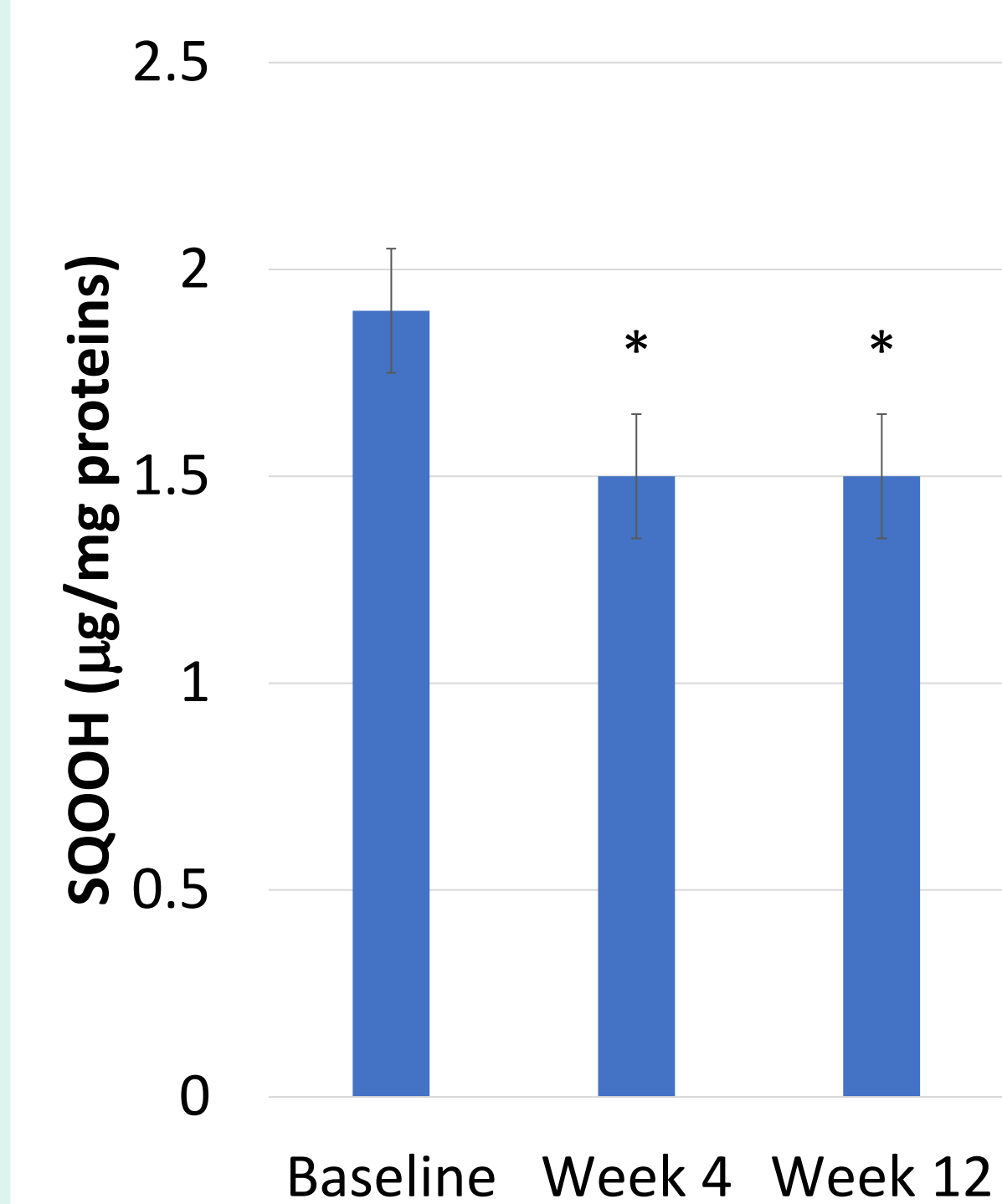


Figure 2: Sebum peroxidation over time



RESULTS

- Overall sebum levels showed reduction as early as week 1 and the trend was maintained throughout the study (data not shown). Furthermore, analysis of the collected sebum samples showed significant reduction in squalene peroxide at both week 4 and week 12 (Figure 2).
- After 4 weeks of product use, subjects showed statistically significant improvement in skin clarity, skin tone evenness, and PIH/PIE which continued to improve through week 12 (Figures 3 & 4).
- Global lesion count showed a modest decreasing trend at week 4, but significant improvement by week 8 and week 12 driven by a reduction in both inflammatory and non-inflammatory lesions. The investigator's global assessment (IGA) of acne severity also showed a significant improvement of 27% at week 12 (Figure 5).

Figure 3: Photographic visualization of skin attributes including overall skin appearance, clarity and PIH at various timepoints.



Figure 4: Evaluation of skin attributes.

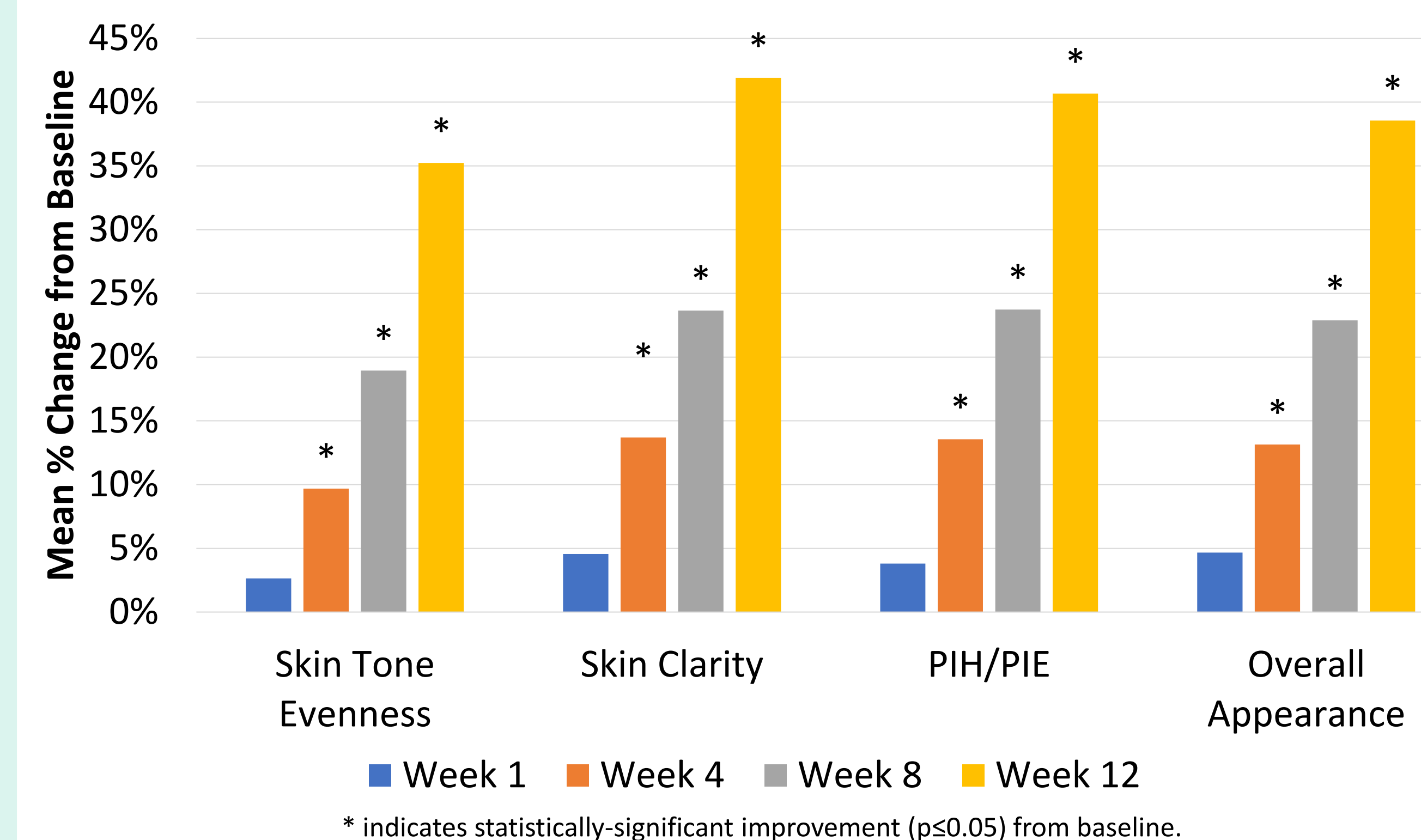
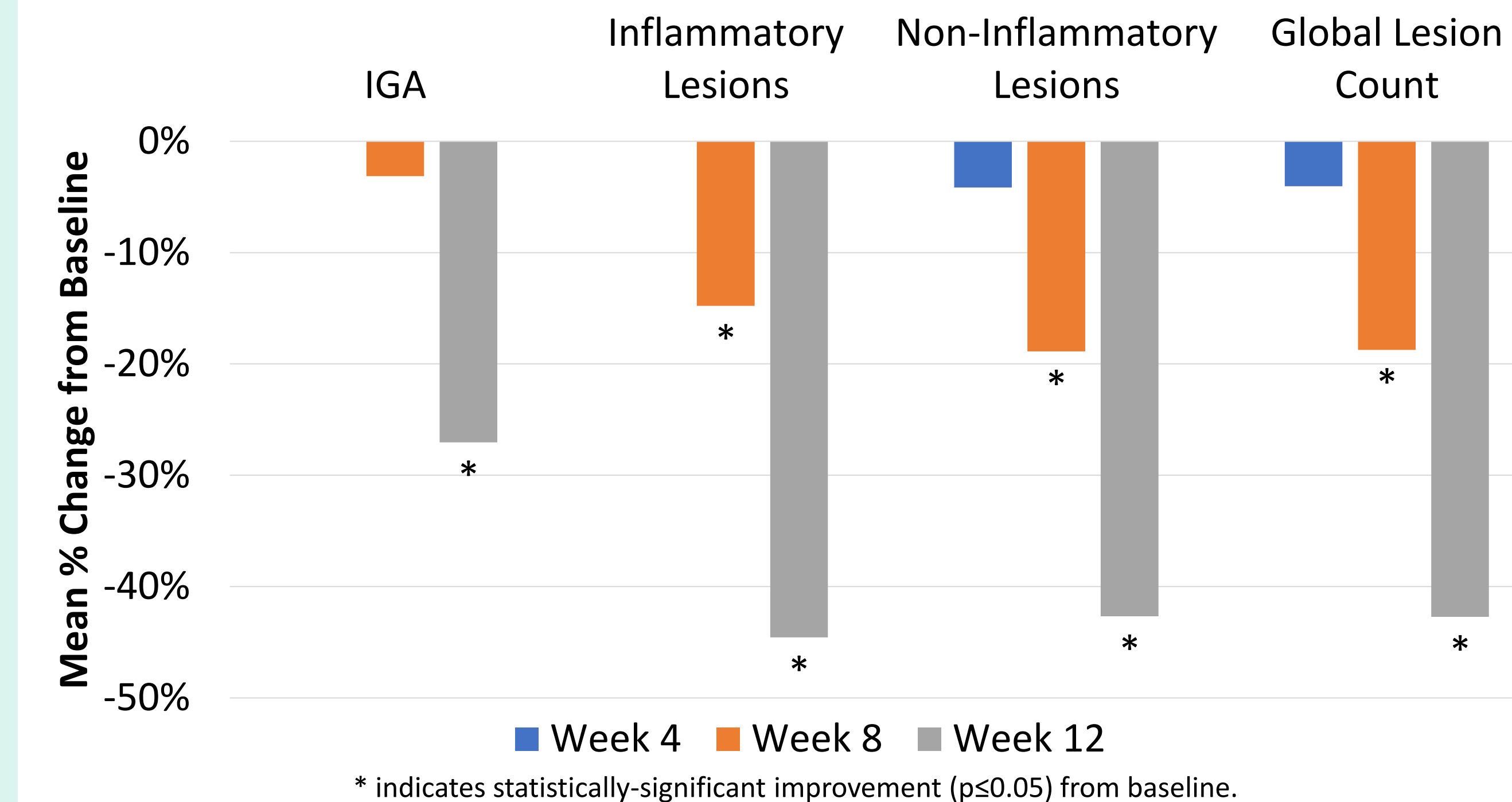


Figure 5: Evaluation of acne parameters



CONCLUSIONS

The results from this study showed that a topical serum containing 0.5% silymarin, 15% vitamin C, 0.5% ferulic acid, and 0.5% salicylic acid was effective in reducing facial acne and improving associated skin attributes such as clarity, tone evenness, and pigmentation. While some skin benefits are seen rather quickly, the strongest improvement in lesional acne is observed with continued usage. This suggests that the fundamental stabilization of lipid peroxidation may be an important underlying strategy for daily management of oily, acne-prone skin while also improving overall skin appearance.

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