Pore Refiner Shrinks Pores, Smooths Skin

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INTRODUCTION

Many women have long sought to reduce the appearance of enlarged pores and improve the texture and appearance of their skin. A survey with more than 2,000 participants revealed that 45% of women wish they could shrink their pores.[1] In the same survey, 38% of women said their pores are too big, and 13% said they fret about the size of their pores at least daily.

While pores are critical in helping the skin release oils and impurities, visible pores are not the openings of individual pilosebaceous follicles or eccrine sweat glands, but rather slight skin-surface depressions containing many sebaceous and sweat ostia.[2] Because pores cover approximately 25% of the skin's surface, it's no surprise that enlarged facial pores give rise to the common complaint of a golf ball-like skin appearance and texture.

Researchers have used tools such as dermatoscopes and confocal microscopy to characterize the appearance of pores. But the causes of enlarged pores – and optimal treatments for them – remain topics of debate. Most experts agree that primary causes of enlarged facial pores include high sebum excretion and loss of skin elasticity with age.[3] Additionally, clogged pores can result in pore widening and acne breakouts. Effective treatment of problematic pores requires addressing these factors, typically with cleansing regimens, topical medications, chemical peels, systemic antiandrogens, lasers and devices.[4,5]

In a recent study, a new pore-refining regimen that uses safe natural and botanical ingredients helped women achieve significant improvements in pore size and skin texture while reducing oiliness over 4 weeks' use. The new at-home regimen requires no prescription or downtime – just AM and PM application. The vast majority of study participants said that using the pore refiner provided visible improvements in parameters such as overall skin appearance, texture, smoothness and number of visible pores.

METHODS

Study objectives included determining if using the pore-refining treatment improved the appearance of skin texture, while reducing the appearance of pores and sebum levels in the skin. At the baseline visit, investigators visually evaluated subjects' skin texture and pores to determine study qualification. Subjects provided informed consent, completed a brief medical history form and underwent digital photography (front, right and left views, using consistent lighting, patient positioning and black draping over clothing and hair to facilitate evaluation). During follow-up visits after one, 2 and 4 weeks' use, investigators used clinical photos and computerized analysis to gauge the treatment's efficacy and safety.

Investigators enrolled a total of 32 women between 41 and 65 (mean: 53) years old who were in general good health and had moderate to medium facial pore size, skin texture scores and sebum content; 26 were Caucasian, and 6 were either black or Hispanic.

Investigators excluded women with visible skin diseases such as acne, eczema or psoriasis, and those who had suntans, sunburns or had undergone any facial resurfacing procedure (laser, dermabrasion) within the past 2 years, or superficial or deep chemical peels within the past 2 or 12 months, respectively. Other factors that could lead to exclusion included a history of cosmetic surgery within the past 10 years, or current use of medications – such as prescription acne medicines or steroidal and nonsteroidal anti-inflammatory drugs – that would interfere with study results.

STUDY MATERIALS

At the baseline visit, investigators gave all participants 2 separate test products – a proprietary cleanser and the pore refiner – with the following key ingredients:

Oilacleanse® cleanser

- **Salicylic acid** – For chemical exfoliation
- **Vitamin E, Melaleuca alternifolia (tea tree) leaf oil and Spiraea ulmaria (meadowsweet) extract** – Antioxidants

Ossential® Instant Pore Refiner

- **Rosa Canina fruit extract** – Balances oily skin and minimizes oil on the skin's surface.
- **Salicyloyl phytosphingosine** – Deep-cleans pores to prevent congestion; reduces pore size and pore depth.
- **ZO-RSS2™ and ZOX12™ (proprietary anti-inflammatory and antioxidant complexes)** – Defend against harmful extrinsic factors.

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- **Marrubium vulgare (horehound) meristem cell culture, Leontopodium alpinum (edelweiss) meristem cell culture –** Provide antioxidant and anti-inflammatory properties.

Investigators instructed subjects to use the cleanser and pore refiner twice daily, in the AM and PM, as follows:

- Wash face with cleanser, then rinse with cool water.
- Apply pore refiner to the entire face – 2 pumps for smaller faces, 3 for larger faces.
- Leave pore refiner on the skin for at least 5 hours per application.

At all study visits, investigators evaluated pore size and skin texture with a 9-point scale:

- **0** Barely visible/none
- **1-3** Small visible pores/slight roughness
- **4-6** Medium-sized pores/moderate roughness
- **7-9** Large visible pores/severe roughness

Also at each visit, investigators measured the amount of sebum present on subjects' facial skin using Sebutape (CuDerm Corp.), a white non-adhesive strip that reflects the presence of sebum after being applied briefly to the skin's surface. Investigators used a 6-point scale (0 = no sebum, 5 = very high sebum level) to evaluate each patient's Sebutape readings. A similar scale was used to measure irritation at every visit. Finally, at all follow-up visits, patients completed a 14-item questionnaire about their symptoms and experience.

STATISTICAL ANALYSIS

At all follow-up visits, investigators used Image-Pro software (MediaCybernetics, Inc.) to determine changes in skin texture and pore size/appearance. To determine changes in skin texture/roughness, each digital image was scanned horizontally and vertically to gauge the intensity of the red, green and blue pixels. A proprietary mathematical algorithm in the Visia CR system (Canfield Scientific, Inc.) calculated texture scores of the scanned areas based on the totals of the mean intensities of the red, green and blue pixels. A decrease in texture score represented an improvement. To detect changes in pore size, the Visia system also measured pore size in pixels.

RESULTS

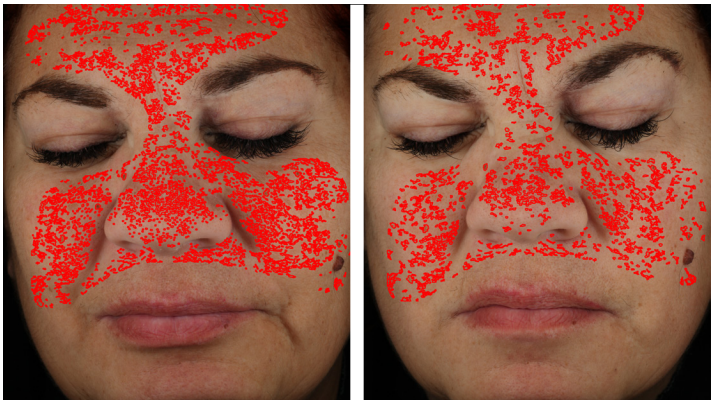
All 32 participants completed the study. Mean baseline qualification scores for pore size and skin texture as determined at the initial evaluation were 6.6 and 5.6, respectively.

No irritation occurred in any subject during the course of the study. No less important is the fact that at all follow-up visits, the study product achieved statistically significant improvements in pore size, based on image analysis, and in skin oiliness, based on Sebumeter measurements.

Versus baseline, pore size improved after one, 2 and 4 weeks of treatment by an average of 3.1%, 6.5% and 8.4% ($p<0.001$ at all time points). At week one, 84% of participants showed improvement over baseline; at week 2, 97% showed improvement; and at week 4, all patients showed improvement.

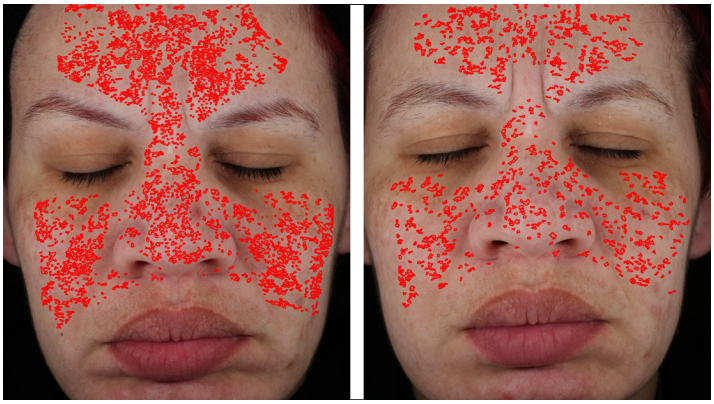
Regarding Sebumeter measurements, subjects experienced mean improvements of 10.8% (at both weeks one and 2) and 13.5% (week 4; $p<0.001$ at all time points). After 4 weeks of treatment, 50% of subjects had experienced improvement, up from 38% at week one and 2.

PATIENT 1



BASELINE 4 WEEKS

PATIENT 2



BASELINE 4 WEEKS

Size of pores measured in Visia CR® using pixel intensities. A decrease in pixel intensity, represented by reduced concentrations of red, demonstrates improvement in pore size.

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Additionally, image analysis showed that skin texture had significantly improved at week 4. Textural analysis at earlier visits produced conflicting results. After one week of treatment, subjects experienced a mean textural improvement of 0.1% versus baseline ($p = 0.57$), with 47% of patients exhibiting some degree of improvement. At the second follow-up visit, average textural score worsened by 2.4% over baseline ($p = 0.044$), with 34% of subjects showing improvement. Week 4 results reversed this apparent anomaly, with patients posting a statistically significant mean improvement of 1.3% over baseline ($p = 0.046$), and 78% of patients exhibiting improvement.

Based on questionnaires, subjects' acceptance of the treatment products remained moderately high throughout the study. After one week of product use, more than 80% of participants strongly agreed with all 14 evaluation statements. The proportion who strongly agreed ranged between 81% (who agreed that using the product regularly improved pore condition) to 97% (in 3 areas: noticeable reduction in the number of visible pores, visible improvement in the reduction of pore size, and reduction in excess oil that can lead to acne and/or blackheads).

The mean percentage of participants who strongly agreed with any evaluation statement at week one was 89.71%. Conversely, the statement that yielded the highest proportion of neutral responses at this point was "Regular use of the product has improved your pore condition," with which 19% of patients neither agreed nor disagreed.

At week 4, the proportion who strongly agreed with any evaluation statement ranged between 78% (Product gives visible reduction in pore size) and 88% (Product provides visible improvement in skin texture and smoothness). Additionally, 87% of respondents strongly agreed with 3 statements (that the product visibly gives skin a matte appearance; the product keeps skin clean and prevents clogged pores that can lead to acne; and that skin appears and feels healthier and younger-looking).

Also at week 4, the statements that yielded the highest level of neutral or negative responses were "Product provides visible improvement in the reduction of pore size," "Product instantly reduces the appearance of my pores" and "Product instantly reduces facial surface oil." A combined 22% of participants expressed neutrality, disagreement, and strong disagreement with each of these statements.

Overall, however, patient acceptance remained high. At week 4, the mean proportion who strongly agreed with any of the questionnaire's 14 statements was 82.79%. Combined with the statistically significant reductions in objective measures including pore size, sebum levels and skin texture at various time points, subjects' responses support the conclusion that the pore refiner regimen effectively addressed several key parameters in the battle against problematic pores.

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