

The Role of Dermocosmetics in Acne Management: Asian Perspective

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Abstract: Acne vulgaris affects a majority of individuals in all world regions, including Asia. It is increasingly recognized to affect the trunk, in addition to the face, although truncal acne is likely to be both under-diagnosed and under-treated. In addition, an increasing population of adult females are seeking treatment for acne, which is often somewhat milder than that seen in adolescents and may be localized along the jawline. In Asia, acne is also common in individuals with sensitive skin, who may have a more difficult time tolerating medical therapies. Dermocosmetics, over-the-counter products with active ingredients, have beneficial effects in the management of acne, both when used alone in milder forms of acne or for maintenance of anti-acne effects and when used as an adjunct to medical regimens to improve tolerability and/or enhance efficacy. This publication, which represents a consensus of dermatologists from eight countries including seven Asian countries, reviews the reported benefits of dermocosmetics and provides recommendations to healthcare providers for ways to incorporate these products into routine practice.

Keywords: acne vulgaris, cosmeceuticals, dermocosmetics, management, over-the-counter

Introduction

Acne vulgaris is a common inflammatory skin disorder worldwide that accounts for a high proportion of consultations with dermatologists (estimated up to 32% of dermatology patients).^{1,2} The majority of individuals suffer from some type of acne during adolescence and early adulthood, and it has been reported that 26% of women and 12% of men have acne that persists into their fifth decade.³ Adult female acne is increasing and can often be challenging to manage.⁴⁻⁷ While the natural history of acne waxes and wanes, it is typically a chronic condition that lasts into the 30s for as many as 80% of individuals.^{8,9} In addition, acne may sometimes have a different presentation in adults, with milder disease and localization to the jawline. The face is the most commonly observed body area for acne, but the disease can also affect the chest, back, or shoulders in more than half of patients.^{10,11} Notably, patients often neglect to discuss truncal acne with treating physicians and acne present in this area is considered to be under-diagnosed as well as under-treated. Further, scarring and pigmentary alterations frequently accompany acne, highlighting the need for early and effective acne management as a preventative.¹⁰ Facial scarring due to acne (of any degree of severity) has been reported in as many as 90% of patients.¹² Post-inflammatory hyperpigmentation (PIH) is a common accompaniment of acne in patients with darker skin phototypes (III–VI), occurring in up to 58% of patients in Asia and as many as 87% in the Middle East.^{13,14} Not only does PIH have a negative impact on the patient (with about half of PIH sufferers reporting it is more burdensome than the acne lesions), it is typically a skin problem that lasts for many months to years.^{15,16} When present



on any body area, acne and its sequelae often cause marked negative psychosocial effects, including reduced quality of life and comorbid anxiety and depression.^{15–17}

Acne has a multifactorial pathophysiology, with primary contributing elements being increased sebum production, imbalance in the microbiome leading to changes in bacterial phylotypes including *Cutibacterium acnes* and *Staphylococcus epidermidis*, abnormal follicular keratinization, and stimulation of the inflammatory process.¹⁸ Inflammation may be the primary driver of acne since it is thought that acne-prone skin is characterized by persistent subclinical inflammation that flares with the additional stimulus of changes in one or more of the other acne-associated pathophysiological factors.¹⁹ Changes in skin barrier function, perhaps due to increases in stratum corneum pH levels, are also seen in patients with acne.^{19,20} Thus, integrating measures that maintain a normal pH level with acne management approaches is likely to be beneficial. AV management's general principles include determination of triggering factors, and combination of medications depending on pathogenesis, clinical manifestation, and psychological aspects. International experts agree that a combination of a topical retinoid and antimicrobial agent is first-line therapy for prescription therapy of acne cases.^{21–23} It has also been recommended to reduce use of antibiotics for acne, particularly topical antibiotics, due to increasing antibiotic resistance.²⁴ In a Japanese population, Koyanagi et al reported resistance rates in *C. acnes* had almost doubled between 2013 and 2020, and depending on the antibiotic had increased even more than twofold higher.^{25,26} In a study from Indonesia, Sitohang et al have reported about *C. acnes* sensitivity to antibiotics in *acne vulgaris*, they identified *Staphylococcus epidermidis* (50.5%), *Cutibacterium acnes* - (11.0%), and *Staphylococcus aureus* (7.7%) in acne lesions.^{27,28} Doxycycline and minocycline showed 100% effectiveness for *C. acnes* but 10% was resistant to erythromycin, clindamycin, and tetracyclin.²⁷ A recent study reported that *Malassezia spp* might be involved in the development of some acne lesions.²⁸

Increasingly, international acne experts are acknowledging the important role that dermocosmetics can have in acne management.^{23,29,30} These products, which could include salicylic acid, niacinamide, and other acne-targeting ingredients, may be useful for patients with milder forms of acne, as adjunct to prescription therapy, and for maintaining the benefits of prescription therapy. The term dermocosmetics describes a range of skincare solutions that are clinically tested, with dermatologically active ingredients with efficacy shown in vitro or in vivo.³¹ These products directly support or care for the symptoms of various skin conditions, providing effects that would not arise from the vehicle alone. Among the positive benefits, dermocosmetics can support skin integrity and relieve skin irritation.³⁰ Figure 1 shows the primary ingredients of interest in dermocosmetics for acne available at the time of writing and Figure 2 illustrates the interaction of the exposome and acne.³² In addition, skincare products for acne patients should be non-irritating, non-allergenic, non-comedogenic, non-

Keratolytics	Salicylic acid, Alpha-hydroxy acid, Gluconolactone, Glycolic acid, HEPES, Linoleic acid, Lipohydroxy acid, Papain, Retinol derivatives
Anti-inflammatory Activity	*Bakuchiol, *Decanediol, **Lactobacillus, Lichochalcone A, Niacinamide, Panthenol, <i>Salix alba</i> , Zinc, Gallic acid, Soy isoflavone, Bixa Orellana seed extracts
Sebum-Controlling Activity	Bakuchiol, *EGCG, Niacinamide, *Zinc, Bixa Orellana seed extracts
Antimicrobial Activity	*Bakuchiol, BPO, Decanediol, *Lactobacillus plantarum, Mannose, Piroctone olamine, <i>Vitreoscilla filiformis</i> (APF), Zinc, Gallic acid, Lauric acid, Antimicrobial peptides, Soy isoflavones, Seaweed-derived oligosaccharides
Skin Barrier & Microbiome Protection	Ceramides/procerad, Glycerine, HEPES, Mannose, Niacinamide, Panthenol, Shea butter, <i>Vitreoscilla filiformis</i> (APF)

*Additional/secondary action; **Fermented; APF=aqua posae filiformis; BPO=benzoyl peroxid; EGCG=epigallocatechin-3-gallate

Figure 1 Active acne-targeting ingredients in dermocosmetics.

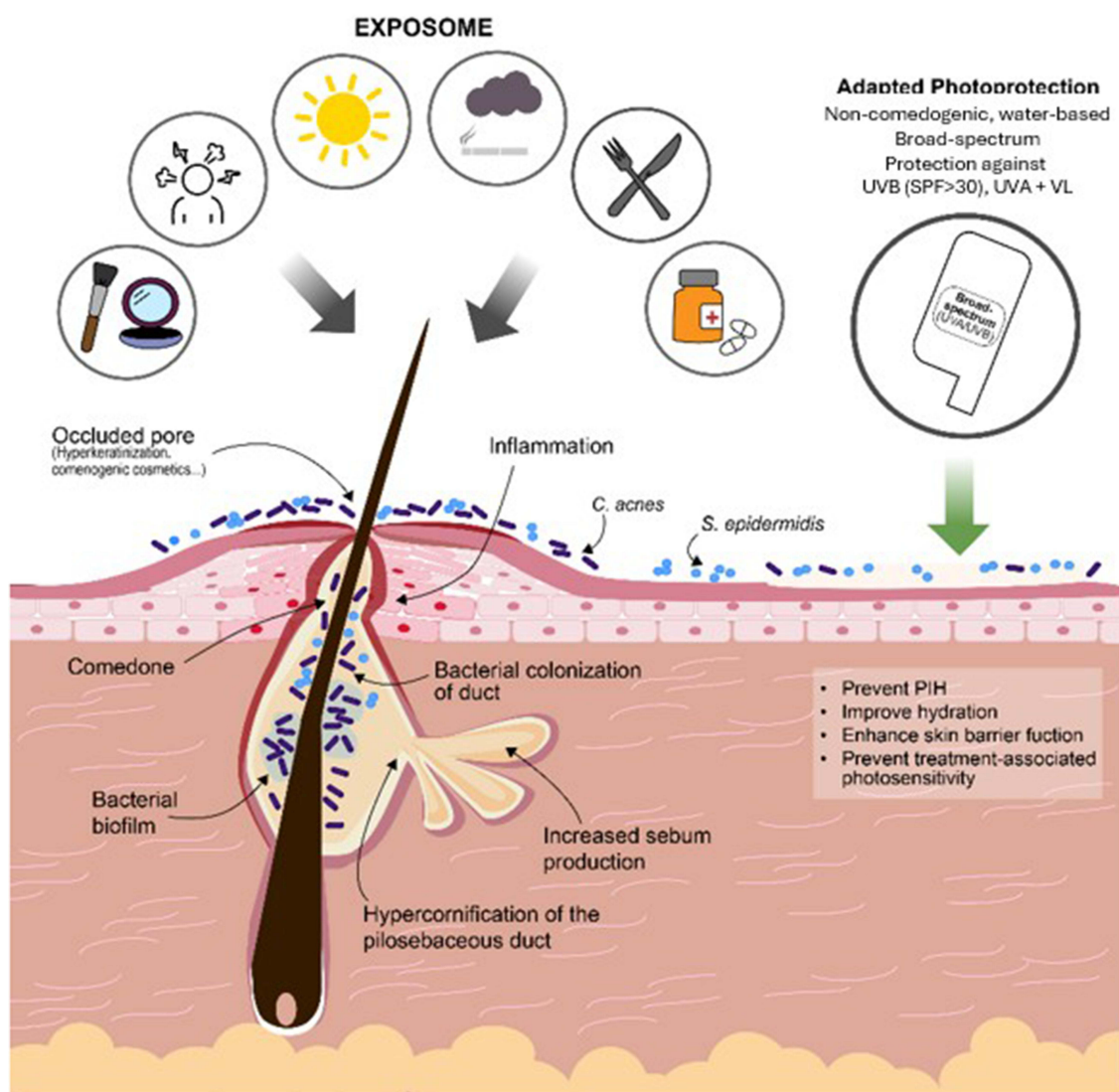


Figure 2 Exposome and acne. Factors such as pollution, lack of sleep, stress, and non-active cosmetics can initiate or worsen acne. Use of optimized dermocosmetics and photoprotection can improve acne. Courtesy of Mariana Carranca, InSkin Consulting, Aix-les-bains, France.

acnegenic, fragrance and ethyl-alcohol free and have a mildly acidic pH.³³ The following features are also desirable: supports and improves skin barrier function, removes or decreases skin surface oil.³³

The objective of this publication is to adapt international consensus recommendations on dermocosmetic use and provide guidance for HCPs managing patients with acne in Asia as illustrated by representative cases.

Methods

The content was developed by literature review and with a consensus meeting with dermatologists from seven Asian countries and France. The group also voted during the meeting and in development of the manuscript on consensus statements. The panelists felt this was needed because existing acne management guidelines have not yet substantially embraced the role of dermocosmetics in acne management. The conclusions of a larger international consensus group were also considered along with their application to the Asian population.³² Panel members selected cases to help illustrate the points they were making.

As a review article, ethics approval was not applicable, nor was informed consent or registry in a clinical trials database.

Acne in Asia

Current acne guidelines for acne management in the Asian population agree with international guidelines that medical first-line therapy for most acne cases includes topical retinoids and antimicrobials.^{34,35} These guidelines do have brief sections about skin care regimens, and generally advise selecting regimens with active ingredients targeted to acne that are well-suited to the patient's skin type and gentle.^{34,35} Yet there is a growing demand among Asia-Pacific acne patients for personal care products, and optimally patients would be educated to select products that target inflammation, pigmentation, or skin texture.²⁴ This may be at least partially attributable to findings that Asian patients experience a significantly higher ($P<0.001$) impact on quality of life compared to White patients.³⁶

Data suggest that Asian patients have skin that is more sensitive in comparison with other skin types, including Caucasian skin.^{36,37} This is thought to be due to Asians having a weaker skin barrier function.²⁴ Asians had lower barrier function in response to mechanical challenge with tape strips compared to Black and White individuals (skin barrier was disrupted by a mean of 3.7 strips in Asians compared to 10.3 in Blacks and 6.1 in White healthy individuals).³⁷ This thinner stratum corneum may correlate with an increased somatosensory response on exposure to toxic, sensitizing or irritating substances.²⁴ Because Asians encompass a wide variety of skin phototypes from Fitzpatrick type III to V, specific Asian populations may have different sensitivity. Goh et al reported that Chinese patients were more likely to experience retinoid-associated irritation compared to patients of Malay or Indian ethnicity.³⁸ Individuals who are prone to irritation or skin sensitivity may have poor adherence to topical acne therapies.²⁴ One global study reported a 48% rate of poor adherence among Asian patients.³⁹

Because of a relatively high natural melanin pigmentation, Asian skin is also prone to developing acne-associated post-inflammatory hyperpigmentation (PIH).^{13,40} In a large-scale survey ($n=324$) of acne patients from seven Asian countries, 58.2% had PIH and more than half of the respondents indicated that they had suffered from PIH for longer than one year, while approximately $\frac{1}{4}$ had PIH that lasted 5 years or longer.¹³ Risk factors associated with poor adherence included adverse events like irritation but also non-use of appropriate skincare products.⁴¹

Discussion

General Recommendations for Skincare

Acne-prone skin often has altered barrier function and dysbiosis of the natural microbiome.⁴² A good skincare regimen for acne patients will typically include a cleanser, moisturizer, and photoprotection as needed.³² An acne-appropriate cleanser removes dirt and sebum while maintaining lipids and skin moisture; this type of product can improve outcomes, tolerability, and skin barrier function.³² The cleanser should have a pH in the range of 4.7 to 5.75, the optimal pH of skin – this means avoiding traditional soaps and choosing synthetic detergents and lipid-free cleansers.⁴³ When too high or too low, pH can impair barrier function and cause dry or sensitive skin.⁴⁴ Patients should avoid aggressive cleansing, which can lead to irritation and dryness. Moisturizers offer benefits in acne skin both alone and when used adjunctively with medical treatments. Photoprotection should be tailored to the season and climate and is particularly important for patients with darker skin phototypes.³² Whenever possible, skincare products should support and maintain a healthy microbiome, and the inclusion of pre- or post-biotic ingredients may be desirable.³²

Dermocosmetics Used Alone in Milder Forms of Acne

There is evidence that dermocosmetics used alone can improve global acne severity, reduce acne lesions, positively affect adherence, reduce surface oil, and maintain an acne-free complexion after successful treatment.³² Acne targeting ingredients for dermocosmetics in this setting include hydroxy acids, niacinamide and zinc, as well as *Vitreoscilla filiformis* and epigallocatechin-3-gallate (EGCG). In a recent representative study of dermocosmetics used alone, twice-daily use of an anti-acne moisturizer containing salicylic acid was shown to have a comparable effect with benzoyl peroxide (BPO) 5% in patients with mild-to-moderate acne. This was an 8-week single-center, randomized, double-blind study of 150 acne patients aged 18 to 40 years; as shown in Figure 3, the salicylic acid moisturizer significantly improved inflammatory, non-inflammatory, and total lesion counts.⁴⁵

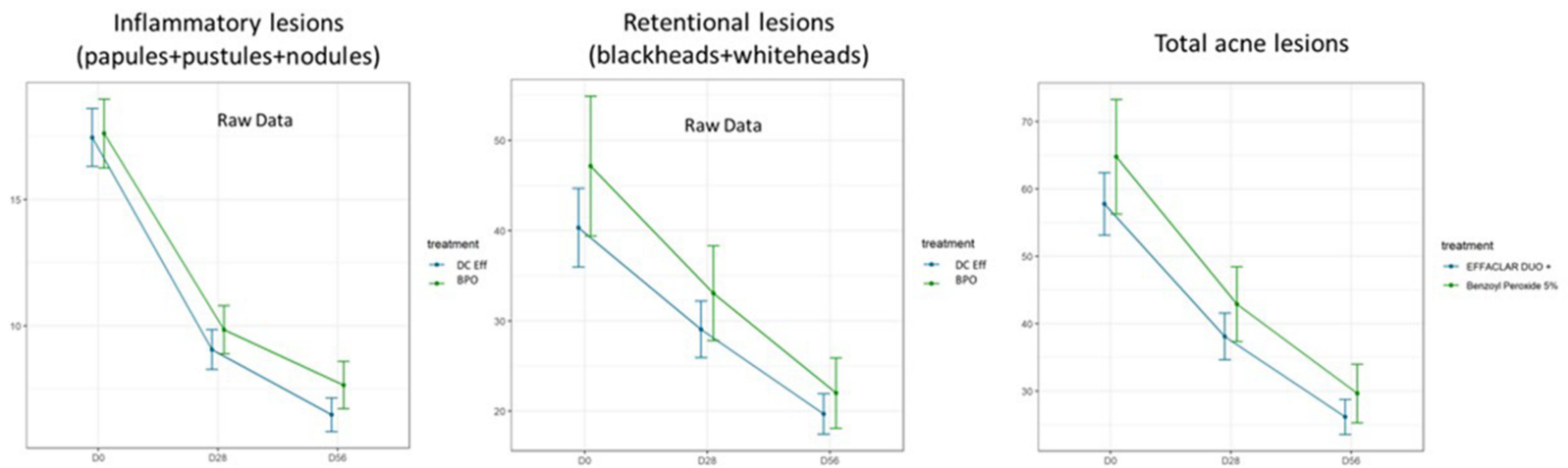


Figure 3 Improvement in acne lesion counts.

Another study evaluated the effect of an anti-acne cleanser plus moisturizer on acne lesion counts. The study was an open-label, intra-individual 8-week study of a twice-daily regimen of a salicylic acid cleansing gel and salicylic acid containing moisturizer in 87 patients with mild-to-moderate acne. Significant reductions in inflammatory, non-inflammatory, and total lesion counts from baseline to week 8 were shown in this study as well ($P < 0.05$ for all comparisons).⁴⁶

Recent Dermocosmetic Studies in Relevant to Asian Acne

Several additional studies have evaluated use of dermocosmetics alone in individuals with PIH, Asian adult patients, and those with truncal acne.^{46–48}

PIH

A sub-analysis of Flament et al compared PIH in patients with Fitzpatrick skin phototypes IV–VI ($n = 45$) with ages ranging from 11 to 42 years. The mean number of PIH lesions was reduced from 35.6 at baseline to 28.6 at week 8 ($P < 0.001$, Figure 4).^{46,49}

Asian Populations

Two studies evaluated use of dermocosmetics in Asian populations ($n = 15$ Chinese adults and 42 Japanese adult women).⁵⁰ The first was an 8-week, split face study comparing the effects of an anti-acne regimen (salicylic-acid containing cleanser and moisturizer) with its vehicle on acne associated erythema (post-inflammatory erythema or PIE). PIE lesions were reduced by 42.5% from baseline at week 8 ($P < 0.05$) compared to 17.3% on vehicle-treated areas.⁵¹ The second evaluated a dermocosmetic containing salicylic acid, niacinamide, zinc, and *Vitreoscilla filiformis* (DC) vs BPO for 4 weeks.⁵⁰ Both inflammatory and non-inflammatory lesions were significantly reduced by week 8 ($P < 0.05$).⁵⁰ In addition, pore visibility was reduced and skin tone was improved.

Dermocosmetics for Maintenance of Acne Clearance

At the time of writing, studies had evaluated the use of dermocosmetics as acne maintenance.^{52,53} The results showed a sustained reduction in visible acne lesions that was significantly different from the placebo or comparator of the study.⁵²

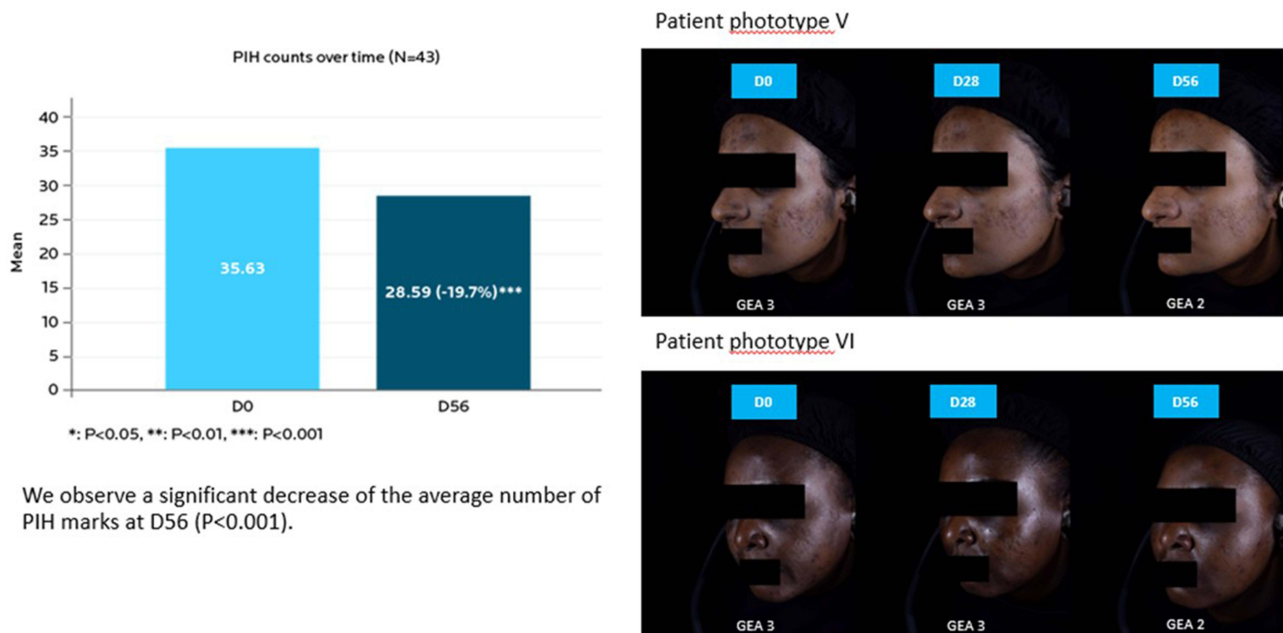


Figure 4 Impact of a dermocosmetic cleansing and moisturizing regimen on PIH lesions.



Figure 5 Effect of a DC cream plus Adapalene for 8 weeks. From Sitohang.⁵⁴

Useful skincare ingredients for maintaining clearance include alpha hydroxy and linoleic acids, niacinamide and zinc, as well as piroctone olamine, procerad, and lichocalcone A+L-carnitine.³²

Adjunctive Use of Dermocosmetics: Enhancing Efficacy of Topical/Systemic Therapy

Studies have shown that dermocosmetics together with medical treatment can significantly enhance efficacy and improve clinical outcomes.³² Combining the two approaches can result in greater reductions in lesions, fewer acne flares, improved maintenance of acne clearance after discontinuation of medical therapy, and a trend toward better global improvement scores. [Dreno] Of interest in this setting are niacinamide, ceramides, Bix Orellana, glycerine, vitamin C, lichocalcone A, L-carnitine, panthenol, and 1,2 decadediol.⁵²

Asian Population

Sitohang et al reported a multicenter, randomized, evaluator-blind study of a topical retinoid with or without an anti-acne dermocosmetic (DC) cream containing Salicylic Acid, Lipohydroxy Acid, Niacinamide, *Aqua-Posae-Filiformis* (APF), Procerad and Zinc-PCA in Indonesian patients with mild to moderate acne (aged 15 to 50 years). Patients (n=293) were randomized into one of three groups: (A) topical retinoid only, (B) topical retinoid every other night plus DC cream every morning, or (C) topical retinoid every night plus DC cream every morning for 56 days. All patients were of Asian ethnicity, 60% were female, 79.5% had Fitzpatrick skin phototype IV, and 55.3% were aged 25 or older. Significant improvements in acne global assessment, lesion counts, and quality of life were reported in all groups. However, global improvement was significantly greater in group C vs A (P=0.028). In addition to superior efficacy, tolerability and satisfaction were improved by the addition of the DC cream. Figure 5 shows a patient who was treated with an anti-acne DC cream plus adapalene for 8 weeks.⁵⁴

Adjunctive Use of Dermocosmetics: Improving Tolerability/Adherence of Topical/Systemic Therapy

Finally, dermocosmetics used together with medical therapy has been shown to improve both tolerability and adherence.^{55,56} A number of dermocosmetic ingredients have utility in this setting, including emollients such as ceramides and shea butter, vitamin E (tocopherol), niacinamide and zinc, glycyrrhetic acid, 1,2 decanediol, L carnitine, the probiotic *Vitreoscilla filiformis*, and Bixa Orellana seed extract.^{55,56}

Conclusions

Asian experts recommend that all acne patients be educated about the need for gentle cleansing, moisturizing, and photoprotection (which may change depending on the time of year, sun exposure, and environmental conditions). Additionally, we recommend that healthcare providers (physicians, nurses, and allied care providers) increase awareness about the benefits of dermocosmetics – both when used alone and as adjunct to medical acne therapy – to be able to counsel patients and optimize treatment outcomes. Further, Asian experts would advise our colleagues to develop strategies for integrating DC into acne management with an emphasis on products that have new technologies and

ingredients. When selecting dermocosmetics for individual patients, the provider should also consider factors such as Fitzpatrick skin phototypes; whether the patient has oily, dry, or sensitive skin; risk for pigmentation; presence and likelihood of truncal acne; and the potential for atrophic acne scarring.

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