doi:10.36849/JDD.6259

 ORIGINAL ARTICLE Journal of Drugs in Dermatology

Recommendations for Using Over-the-Counter Products as Adjunctive Acne Care in Asian Phototypes: Improving Treatment Outcomes and Managing Side Effects

Anneke Andriessen PhD,[a] Xian Jiang MD PhD,[b] Kanokvalai Kulthanan MD,[c] Chih-Hung Lee MD PhD,[d] Rodney Sinclair MBBS, MD, FACD,[e] Cheng-Feng Zhang MD PhD[f]

[a]Radboud University Medical Center, Nijmegen, The Netherlands; Andriessen Consultants, Malden, The Netherlands
[b]Department of Dermatology, West China Hospital, Sichuan University, Chengdu, China; Laboratory of Dermatology, Clinical Institute of Inflammation and Immunology (CIII), Frontiers Science Center for Disease-related Molecular Network, West China Hospital, Sichuan University, Chengdu, China
[c]Siriraj Hospital of Mahidol University, Bangkok, Thailand
[d]Department of Dermatology, Kaohsiung Chang Gung Memorial Hospital and Chang Gung University College of Medicine, Kaohsiung, Taiwan
[e]University of Melbourne, Victoria, Australia; Wellington Parade, East Melbourne, Australia
[f]Department of Dermatology, Huashan Hospital of Fudan University, Shanghai, China

ABSTRACT

Background: Acne vulgaris (acne) is a common inflammatory skin disorder prevalent among all ethnic groups. This review aimed to investigate the current literature regarding the potential benefit of over-the-counter (OTC) adjuncts (eg, moisturizers, cleansers) for acne patients focusing on Asian phenotypes.

Methods: An online procedure was employed to review the role of adjunctive OTC acne treatment. A panel consisting of dermatologists with expertise in treating Asian acne patients participated in a pre-meeting survey that collected information regarding their recommendation habits for OTC products in acne patients. Recommendations on using OTC products as an adjunct for treating acne in Asians are based on the pre-meeting survey results, evidence from literature presented during a series of plenary lectures, and discussions conducted during a stepwise program of sessions.

Results: Many topical treatments have been associated with adverse events (AEs) (eg, skin dryness, erythema, scaling, stinging, burning, pruritus). Multiple studies on topical acne treatments have found that Asians display greater sensitivity and less tolerability than Caucasians to acne treatment. Skincare as an adjunct to acne treatment may reduce dryness or irritation, particularly important in Asians with acne.

Conclusions: Advisors agreed that cleansers and moisturizers should be considered for their beneficial adjunctive role in the armamentarium of acne treatment and maintenance strategies.

J Drugs Dermatol. 2021;20(11):1213-1221. doi:10.36849/JDD.6259

INTRODUCTION

Acne: Etiology, Pathogenesis, Epidemiology, Quality of Life

Acne vulgaris (acne) is an inflammatory skin disorder with multifactorial etiopathogenesis. Factors including follicular epidermal hyperproliferation, sebum hyperproduction, inflammation, and colonization by *Cutibacterium acnes* are implemented in the development and/or exacerbation of acne.[1] Depending on disease severity, acne breakouts can consist of non-inflammatory (ie, open blackheads or closed comedones) and/or inflammatory lesions (ie, papules, pustules, nodules, cysts and/or macules), frequently appearing on the face but also occurring in other body regions (eg, back, chest). The Global Burden of Disease Project ranks acne as the eighth most prevalent disease worldwide,[2,3] with a global prevalence rate estimated at 9.4%. Acne most often occurs in adolescence, with incidence rates peaking between the ages of 14–17 years for females and 16-19 years for males.[4,5] This inflammatory skin disorder, however, is also becoming more prevalent among the adult population.[5,6] Being a distressing disorder, acne negatively affects the quality of life and psychosocial wellbeing (eg, anxiety, depression, low self-esteem). Acne can also lead to physical complications, such as permanent scarring.[7,8]

Acne: Prescription Treatments

The choice of prescription treatment for acne depends strongly on the type (inflammatory versus non-inflammatory), underlying causes (eg, polycystic ovarian syndrome), and

severity of lesions. Systemic (eg, antibiotics, hormone therapy) and topical (eg, isotretinoin gel, benzoyl peroxide, salicylic acid) prescription medications are available as monotherapies or combination treatments. The "Global Alliance to Improve Outcomes in Acne" recommends using combination agents to target most of the pathophysiological features of acne, not only as they can target multiple processes, but they can also provide faster and more complete lesion clearance compared to monotherapy.[9] Unfortunately, topical treatments have been associated with side effects, including visible signs of intolerance such as skin dryness, erythema, and scaling, as well as subjective symptoms of irritation such as stinging, burning, and itching. Studies reveal that experiencing side effects can reduce adherence to acne treatment by up to 50%,[10] with non-use of moisturizing creams and cleansers also being linked to poor compliance.[11]

Acne: Non-Prescription Adjuvants

Over-the-counter (OTC) products play a primarily adjunctive role in acne treatment and maintenance. Relevant OTC products may include skin cleansers, moisturizers, and sunscreens, among others. These products may offer several benefits to acne-prone skin, such as reducing oiliness, redness, inflammation, pain/discomfort, improving skin texture, time for lesions to heal, the extent of scarring, and potentially, the number and severity of acne breakouts.[12] They may provide adjunctive benefits, such as helping to treat the signs and symptoms of acne, and/or they may play a role in acne maintenance by mitigating side effects of prescription medications, thereby improving treatment compliance and outcomes.[13,14] Notably, the market for OTC acne products is an order of magnitude larger than that for prescription medications, and acne patients commonly use homeopathy.[15] As many acne patients have been reported to try multiple OTC products prior to seeking medical attention and often continue using them while receiving prescription therapy; OTC products may impact treatment outcomes.

Acne in Asian-Pacific Skin

In the 21st century, there was an important demographic change, with half of the world's population identifying as "Asian"; a term generally referring to those from the Asian-Pacific (APAC) regions of East, South, and Southeast Asia, and can include Oceania and/or the Indian subcontinent. Partially due to this population growth, Asians also make up one of the fastest-growing ethnic groups desiring aesthetic treatments and procedures.[16] Other factors contributing to this trend include increasing disposable income and shifts in social perceptions of acceptability regarding aesthetics.[2,5,6] Given their differential skin characteristics (eg, melanin content), specific environmental/geographical factors (eg, pollution), and unique cultural (eg, diet) and psychosocial influences, Asians represent a distinct ethnic group. Among Chinese and Japanese subjects, Asian skin typically consists of Fitzpatrick phenotypes III to IV (light to moderate brown), while types IV and V (dark brown) is more common among Indians and Pakistanis.[17] Therefore, Asian skin tends to consist of more melanin than their Caucasian counterparts (Fitzpatrick types I to III), allowing for superior natural photoprotection while also increasing the risk of pigmentary disorders. Post-inflammatory hyperpigmentation is peculiar to this skin type, which can occur after cutaneous damage from acne lesions or following the use of laser therapy. The treatment-seeking behaviors and related epidemiological features in Asian acne patients have been found to vary from that of the rest of the world,[18] and multiple studies on topical acne treatments have found that Asians display greater sensitivity and less tolerability than Caucasians.[19] For example, approximately 80% of Japanese patients experienced mild adverse effects following the first month of adapalene use, compared to the 20–30% observed in trials involving Caucasians.[15]

Currently, there is limited data regarding the use of OTC adjuvants in acne treatment and maintenance, and trends in clinical practice are not consistent in this regard. Moreover, it is important to continue studying the unique challenges of treating acne in Asian skin, to optimize clinical outcomes in this population.[2,5,6,17] The current manuscript aimed to evaluate the role of OTC products in the treatment of acne, particularly in Asian skin.

MATERIALS AND METHODS

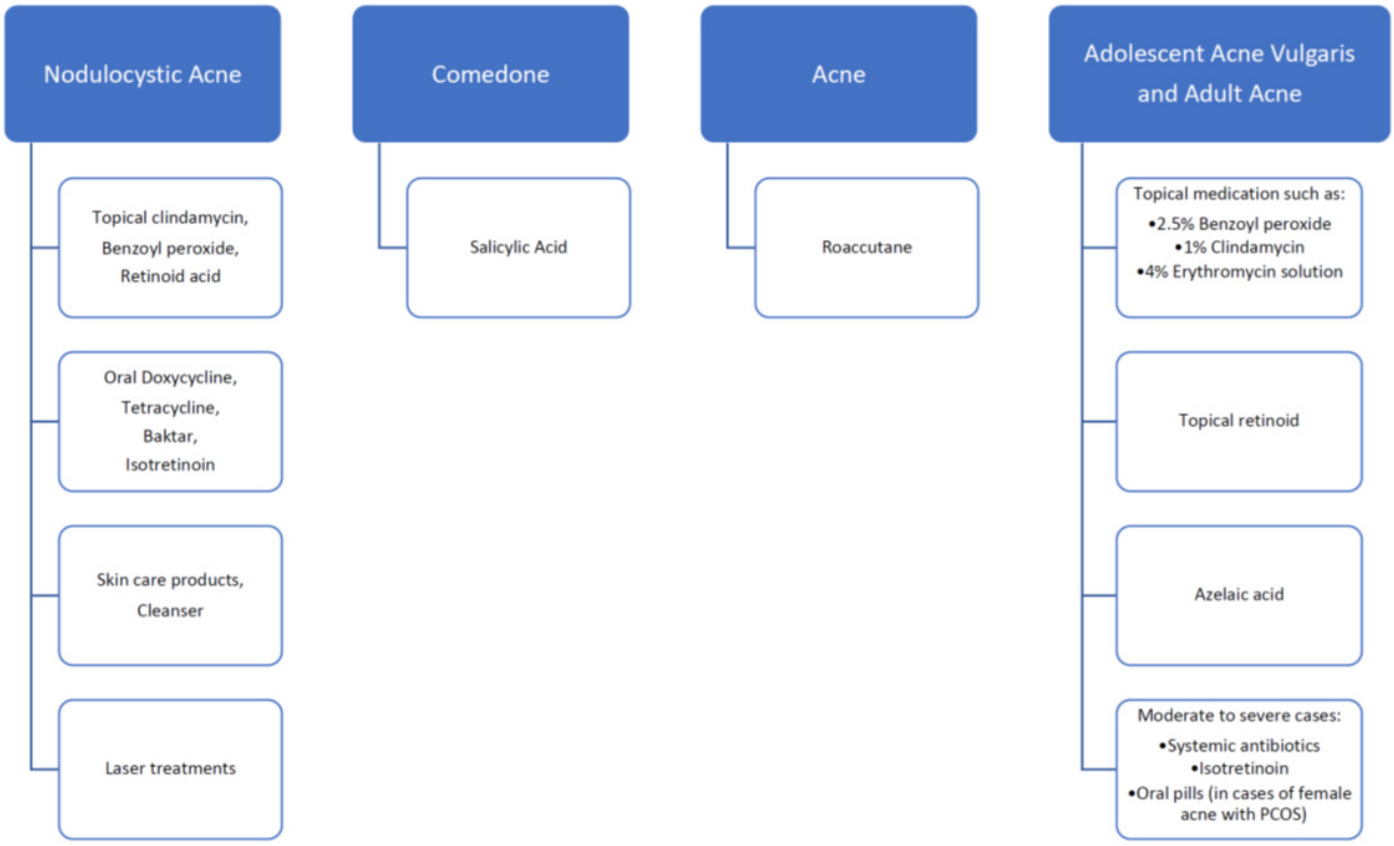
An advisory panel consisting of key opinion leaders and dermatologists with expertise in the treatment and maintenance of acne in Asian skin was held in December 2020, via web conference. Prior to the meeting, advisors participated in an online survey that collected data regarding: which (if any) OTC products they currently recommend for acne patients; for which (if any) patient profiles do they recommend these products; when they recommend OTC adjunctive therapies be used; how they recommend OTC products be used; and why advisors recommend specific OTC products as adjuncts to acne therapy. The pre-meeting survey results, evidence from the literature presented during a series of plenary lectures, and discussions conducted during a stepwise program of sessions were used to develop recommendations on the use of OTC products as an adjunct for treating acne in Asians.

RESULTS

Survey

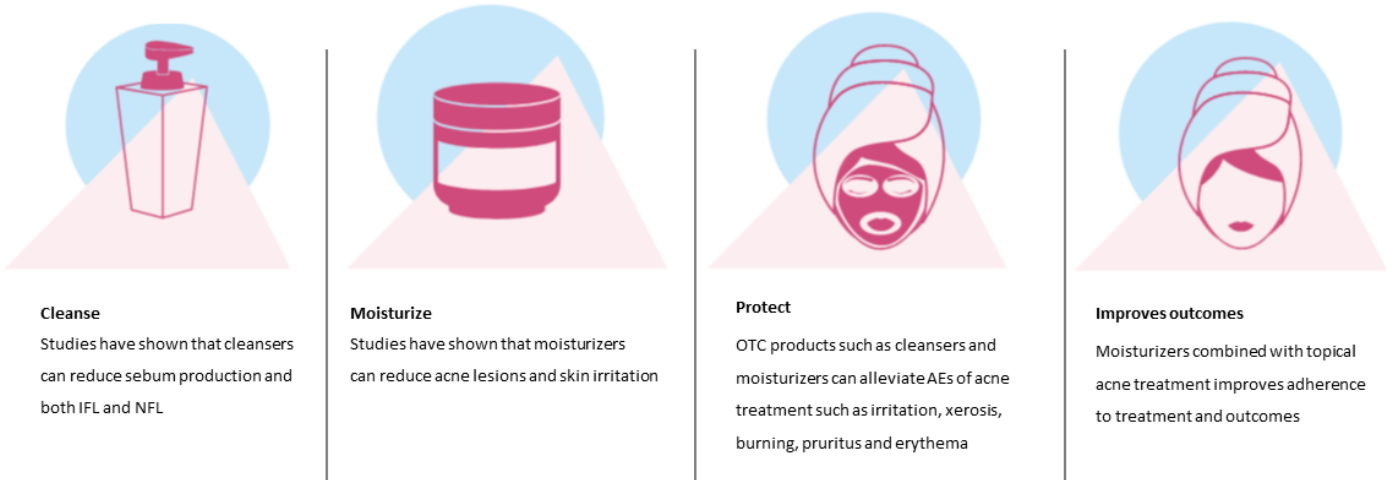
Acne subtypes observed in the clinics of advisors and the corresponding therapeutic option(s) used to treat these conditions are displayed in Figure 1. According to advisors, OTC products currently serve an adjunctive role under three main conditions: 1) used remedially prior to or in combination with prescription medications, 2) post-procedural use (eg, after a chemical peel, microdermabrasion, laser therapy), or 3) when used as part of a maintenance regimen. Advisors reported

FIGURE 1. Acne subtypes observed in the clinics of advisors and the corresponding therapeutic option(s) used to treat these conditions.



Polycystic ovary syndrome (PCOS)

FIGURE 2. Summary of the benefits of OTC products as adjuncts to acne treatment for patients with acne-prone skin.



Over-the-counter (OTC), Inflammatory lesions (IFL), Non-inflammatory lesions (NFL), Adverse events (AEs)

TABLE 1.

What Is Your Choice of OTC Product for Acne Monotherapy?

No.	Authors	Title	Study design	Endpoint(s) of interest	Conclusions regarding OTC products for acne-prone skin
1	Angelova-Fischer I, et al. J Eur Acad Dermatol Venereol. 2013;27:6–11.13	A double-blind, randomized, vehicle-controlled efficacy assessment study of a skin care formulation for improvement of mild to moderately severe acne	A double-blind, randomized, vehicle-controlled study to assess the stand-alone efficacy of a skin care formulation in 60 volunteers with mild to moderately severe acne. Subjects were randomized into two groups (active formulation versus vehicle) twice daily, for 8 weeks	After 8 weeks, the active formulation group showed a reduction in the mean total lesion count, papules, pustules, sebum levels and P. acnes colonization	The application of a moisturizer improves acne treatment outcomes, compared to vehicle
2	Abad-Casintahan F, et al. J Derm. 2011;38(11):1041-1048.15	Toward evidence-based practice in acne: consensus of an Asian working group	Experts from ten countries reviewed acne care within the APAC region	An algorithm for acne care, based on the results of clinical trials and local practice patterns	Physicians and other care providers should be educated on non-pharmalogical options for effective acne therapy
3	Choi JM, et al. Pediatr Dermatol. 2006;23:421–7.20	A single-blinded, randomized, controlled clinical trial evaluating the effect of face washing on acne vulgaris	Randomized clinical trial	Effect of face washing on acne	Washing twice daily improves both open comedones and total noninflammatory lesions
4	Choi YS, et al. J Dermatol Treat 2010;21:201–5.21	A study of the efficacy of cleansers for acne vulgaris	Eight-week, double-blind, randomized clinical trial in 13 acne patients	Effectiveness of cleansers to produce clinical improvements in acne	Cleansers reduced both inflammatory and non-inflammatory lesions and may be helpful for acne treatment
5	Dreno B, et al. J Eur Acad Dermatol Venereol. 2013;27: 1071–80.22	Algorithm for dermocosmetic use in the management of cutaneous side-effects associated with targeted therapy in oncology	Review of published experimental vehicle systems for benzoyl peroxide	Identify formulations that can improve the tolerability of benzoyl peroxide	An increase in tolerability to benzoyl peroxide can be achieved by combining it with moisturizing substances
6	Goh CL, et al. J Cut Aesthet Surg. 2016;9(2):85-92.23	Meeting the challenges of acne treatment in Asian patients: a review of the role of dermocosmetics as adjunctive therapy	Review of the evidence on dermocosmetics use in APAC acne populations	Practice recommendations on the role of dermocosmetics as adjunct for treating acne in Asian patients	Appropriate use of dermocosmetics may help augment the benefits of acne treatment, minimize side effects, and reduce the need for topical antibiotics
7	Chularojanamontri L, et al. J Dermatol Treat. 2016;27(2):140-145. 26	A double-blinded, randomized, vehicle-controlled study to access skin tolerability and efficacy of an anti-inflammatory moisturizer in treatment of acne with 0.1% adapalene gel	Randomized clinical study in 120 subjects	Cutaneous irritations to acne medications	The combined use of adapalene gel and moisturizer can reduce undesirable side effects without interfering the efficacy of adapalene
8	Lynde CW,et al. J Drugs Dermatol. 2019 Dec 1;18(12):221.28	Clinical Insights About the Role of pH in Acne	Consensus recommendations	Explore the influence of skin pH on acne	As an adjunct to treatment, a pH-balanced ceramide containing cleanser and moisturizer may help in managing skin barrier function
9	Lain E, Andriessen AE J Drugs Dermatol. 2020 Nov 19(11):217.29	Choosing the right partner: Complementing prescription acne medication with over-the-counter cleansers and moisturizers	Literature review	Explore the importance of adjunctive skincare for managing acne and avoiding adverse events	Adjunctive skincare may complement prescription therapy and benefit skin barrier dysfunction

TABLE 1. (CONTINUED)

What Is Your Choice of OTC Product for Acne Monotherapy?					
No.	**Authors**	**Title**	**Study design**	**Endpoint(s) of interest**	**Conclusions regarding OTC products for acne-prone skin**
10	Munehiro A, et al. J Dermatol Treat. 2012 Jun; 23(3):172-6.33	Combination effects of cosmetic moisturizers in the topical treatment of acne vulgaris	Cohort of 18 male Japanese patients with acne vulgaris who were treated with the topical administration of adapalene and clindamycin phosphate gels, plus moisturizers	The use of moisturizers did not impact the efficacy of the standard topical acne treatment and they significantly improved the water content of the stratum corneum and the sensation of dryness.	Using moisturizers in combination with standard topical acne treatments may improve adherence to therapy by alleviating the sensation of dryness.
11	Hayashi N, Kawashima M. J Dermatol Treat. 2012 Jun; 23(3):172-6.34	Study of the usefulness of moisturizers on adherence of acne patients treated with adapalene.	100 patients with acne vulgaris were randomly assigned to one of two groups: group A (adapalene + moisturizer) or group B (adapalene alone). Adherence to treatment was assessed after 4 weeks of treatment.	Examine the usefulness of moisturizers concomitant with adapalene on adherence to treatment and its therapeutic effects.	The concomitant use of a moisturizer with adapalene did not affect its therapeutic effects and helped to improve adherence to treatment with adapalene.
12	Matsunaga K, et al. J Dermatol Treat. 2013 Aug; 24(4):278-82.35	Adjunctive usage of a non-comedogenic moisturizer with adapalene gel 0.1% improves local tolerance: a randomized, investigator-blinded, split-face study in healthy Asian subjects	Four-week, randomized, investigator-blinded, split-face study among 30 healthy volunteers of Chinese origin. Adapalene gel was applied once daily to the whole face and a moisturizing lotion was applied once daily to only one side of the face according to the randomization scheme.	Investigator and subject reported tolerance (erythema, desquamation, dryness, stinging/burning and pruritus)	The adjunctive usage of an effective moisturizer improves local tolerance of adapalene gel and may contribute to better adherence
13	Chularojanamontri L, et al. J Clin Aesthet Dermatol. 2014 May; 7(5):36-44.36	Moisturizers for Acne: What are their Constituents?	A review of the active ingredients and properties of moisturizers suitable for acne-prone skin	Most products had anti-inflammatory, occlusive, humectant, and emollient properties	Scientific data regarding available ingredients are discussed to guide physicians in selecting moisturizers for acne patients
14	Bikowski J Cutis. 2001 Dec; 68(5 Suppl):3-11.37	The use of therapeutic moisturizers in various dermatologic disorders	Narrative review	Role of moisturizers as adjuncts to acne therapy	Moisturizers can serve as important adjunctive therapeutic modalities for patients with various dermatologic disorders, including acne vulgaris
15	Angelova-Fischer I, et al. J Cosmet Dermatol. 2012;11:30–6.38	Topically applied L-carnitine effectively reduces sebum secretion in human skin	A three-week, vehicle-controlled, randomized, clinical trial	Sebum production	Topically applied moisturizers can lead to significant sebum reduction in subjects with oily skin
16	Andriessen A, et al. J Drugs Dermatol. 2021 Mar 1;20(3):244-250.	Over the Counter Products for Acne Treatment and Maintenance in Latin America: A Review of Current Clinical Practice	Survey of clinical practice and literature review	Investigate real-world OTC product recommendations for acne patients	Advising dermatologists agreed that OTC products used as adjuncts are a crucial part of a successful acne therapy and can improve acne symptomology and severity

N = 5 Once a day (QD), Twice a day (BID), Not specified (ns)

TABLE 2.

What Is Your Choice of OTC Product for Acne Adjunct Therapy?					
Choice	**Product Name**	**Where would you use this product?**	**When would you use this product?**	**How would you use this product?**	**Why would you use this product?**
First	Differin, Galderma	Comedones and scars	Every night	QD	Normalization of keratinization
	Avene Diacneal	ns	ns	ns	ns
	Benzac Wash	Face, back, chest	ns	QD before shower	Prophylaxis against relapse or mild popular disease
	Effaclar Duo plus	On the face	When acne lesions subside and leave post acne redness and hyperpigmentation	QD or BID	Because patients always concern of the residual of acne lesions
	SkinCeuticals	Face	Local treatment Mild acne	BID	Good effect
Second	Duac, GSK-Stiefel	Inflamed cysts and nodules with comedones	Facial inflamed skin lesions	QD to BID	Combination of BP and Clindamycin
	Clindatech	Face	ns	QD	Pustules
	Eucerin Proacne solution	Face, sometimes trunk	In the maintenance phase of acne	QD or BID	It contain salicylic acid, lichocalcone (antiinflammatory property), L-carnitine (control sebum), Decanidiol (decrease acne biofilm formation)
Third	Skinoren, azelaic acid, Bayer	Pigmentations and scars with minimal inflammation	Facial lesions	BID	Normalization of keratinization and pigmentation
	Neutrogena facial foam scrub	On face	To clean the face in patients who have seborrhea	BID	In mild cases, to clear mild comedonal lesions

N = 5 Once a day (QD), Twice a day (BID), Not specified (ns)

TABLE 3.

What Is Your Choice of OTC Product for Acne Maintenance Therapy?					
Choice	**Product Name**	**Where would you use this product?**	**When would you use this product?**	**How would you use this product?**	**Why would you use this product?**
First	Neutrogena cleanser	Greasy facial skin	Facial cleansing	BID	Patient compliance and consistency
	CeraVe Foaming Cleanser	Face, trunk	Cleanser	BID	Gentle cleanser
	Cetaphil cleanser	Face	Cleanser	BID	Make-up removal
	Effaclar Duo	Face, trunk	When acne lesions subside and leave post acne redness and hyperpigmentation	BID	Because patients are always concerned about post inflammatory hyperpigmentation and redness
	Effaclar Mild regime, La Roche-Posay	Face	Before and after drug treatment	QD	Adjuvant therapy, clean and moisturizing
Second	Effaclar, La Roche Posay	Greasy skin with mild erythema	Cleansing	BID	Compliance and consistency
	CeraVe cream	Face	In patients who have dry skin when using topical antiacne preparation and those who receive oral isotretinoin	Apply on the whole face	Pustules
	QD or BID	To increase patients' compliance	In the maintenance phase of acne	QD or BID	It contain salicylic acid, lichocalcone (antiinflammatory property), L-carnitine (control sebum), Decanidiol (decrease acne biofilm formation)
Third	Curél intensive moisturizing cream	Greasy skin with moderate inflammation	ns	BID	Light, consistency, and Asian skin
	Eucerin Proacne solution	Face, sometimes trunk	Face, sometimes trunk	QD or BID	It contain salicylic acid, lichocalcone (antiinflammatory property), L-carnitine (control sebum), Decanidiol (decrease acne biofilm formation)

N = 5 Once a day (QD), Twice a day (BID), Not specified (ns)

TABLE 4.

Literature Regarding the Use of OTC Products in Patients With Acne-Prone Skin

Choice	Product Name	Where would you use this product?	When would you use this product?	How would you use this product?	Why would you use this product?
First	CeraVe acne foaming	Residual inflammation and minimal scars	Cleansing	QD	Good cleansing effects with antimicrobiome and keratinization normalization
	Eucerin Proacne solution	Face, sometimes trunk	When lesions subside for more than 50% of the baseline	BID	It contain salicylic acid, lichocalcone (antiinflammatory property), L-carnitine (control sebum), Decanidiol (decrease acne biofilm formation)
	SkinCeuticals	Face	Before and after drug	If needed	Adjuvant and maintenace therapy
Second	Cetaphil	Minimal inflammations and comedones	Cleansing	QD	Good compliance
	AcneAid liquid cleanser or bar	Face or trunk	As cleansers	BID	They contained salicylic acid which help to prevent new acne lesions
	LRP	Face	Before and after drug	If needed	Adjuvant and maintenance therapy
Third	SK-II	With some pigmentations	ns	QD	AHA, Asian, and consistency
	CeraVe acne foaming cream cleanser	Face, trunk	When acne lesions subside	BID	It contains benzyol peroxide which is effective in treating acne lesions and also contains niacinamide which help reducing inflammation.

N = 5 Once a day (QD), Twice a day (BID), Not specified (ns)

recommending OTC products also when encouraging the use of a photoprotective product that is still suitable for acne-prone skin (ie, non-greasy formulation, thin application). When asked what advisors looked for in an OTC adjunct to acne therapy, responses included being physiological-based, hypoallergenic, affordable, and able to provide long-lasting moisturization. To reduce unwanted side effects of prescription acne treatments (eg, drying, stinging), the panel recommended that moisturizers be applied prior to other topical agents.

Product recommendations varied depending on the primary intended use of the products (ie, as a stand-alone therapy; as an adjunct to treatment; for maintenance of treatment results). For acne monotherapy, OTC products reported to be used by advisors included SkinCeuticals, Effaclar Duo+, Benzac Wash, Avène Diacneal, and Differin (Table 1). Adjunctive and maintenance OTC products included La Roche Posay, Effaclar Duo Plus, Cetaphil, CeraVe Foaming Cleanser, and Neutrogena cleanser (Table 2 and Table 3).

For cleansers, advisors stressed the caveat that Asian skin tends to be more sensitive than other phototypes. Thus, irritants commonly included in cleansers for acne-prone skin (eg, salicylic acid) may lead to greater severities of irritation in these patients. Concentrations of these ingredients may need to be lower in products aimed at targeting the Asian market, or less irritating ingredients should be considered. For example, advisors proposed using 10–15% azelaic acid instead of 2% salicylic acid in a product targeting pigmentation. It was also thought useful to add ingredients capable of counteracting the transient irritation caused by azelaic acid. Other ingredients found suitable by the advisors were nicotinic acid and/or tranexamic acid. Advisors concluded that there is a current unmet need for an economical product indicated for face, back, and chest acne and that the ideal product to be used in an acne regimen would include lipid-free cleansers, synthetic detergents (syndets), astringents, exfoliants, or mild abrasives. Cleansing liquids were preferred over bars. Finally, the expert panel concluded that, while the choice of the cleanser should be suited to the patient's skin profile, all acne patients can benefit from a cleansing regimen and should therefore be educated on the proper selection and use of cleansers, as they have been found to increase treatment compliance and reduce lesions.[20,21]

DISCUSSION

Supporting Literature

A list of literature regarding the use of OTC products in acne-prone skin is displayed in Table 4. A recent large-scale review of a national patient database revealed that acne monotherapies are typically prescribed without co-prescribing topical non-antibiotic agents.[12] However, OTC products are believed to target various etiopathogenic factors of acne (eg, antibacterial,

anti-inflammatory, reductant of sebum, dryness, irritation), may improve the penetration of prescribed topical medications, or may help mitigate side effects of treatments.[22] Appropriate use of OTC products may help improve the effectiveness of acne treatment, minimize side effects, and reduce the need for topical antibiotics. This is of growing importance in a world where *C. acnes* resistance progresses at an alarming rate due to continued antibiotic use.[4]The need for alternative, non-antibiotic treatments for acne is now widely accepted.[5]

Several groups have produced independent acne treatment guidelines, but few have previously considered practices specific to the APAC region. A group of global experts, including from nine Asian countries and the United States, have previously gathered to review clinical trial data and local practice patterns. This resulted in the development of a best practice algorithm and recommendations for the treatment of acne in Asian patients.[15]The experts concluded that physicians and other care providers should be educated on non-pharmacological options for effective acne therapy.

In 2015, twenty-one Asian dermatologists from Hong Kong, India, Indonesia, Malaysia, Philippines, Singapore, Taiwan, Thailand, Vietnam, and Italy met to discuss and provide insight into current treatment practices in acne therapy and OTC product recommendations. The advisors reviewed the perspectives of dermatologists from different centers around APAC that regularly treat acne patients and achieved a general consensus that OTC agents can target various etiopathogenic factors relevant to acne.[23]This may include antibacterial and anti-inflammatory properties, reduction of sebum, dryness, irritation, photosensitivity, and enhancing the penetration of prescribed topical medications.[22] Most of the OTC products reviewed by the experts were found to include components that target inflammation, wound healing, photoaging, hyperpigmentation, or uneven skin texture.[23]

Recent advances in understanding normal skin physiology and the pathophysiology of acne should allow for the development of OTC therapies capable of offering a broad spectrum of treatment targets.[6,24] For example, OTC products can now be manufactured in such a way as to make them especially suitable as an acne treatment/monotherapy or an adjunct to mitigate side effects of another treatment. Previous studies have found that moisturizers can improve disease severity in patients with mild-to-moderate acne,[13,25] and that a greater reduction in lesion counts, papules, pustules, *C. acnes* colonization, and sebum production is observed after eight weeks of adjunctive use, compare to treatment alone.[26] Since there is an overwhelming amount of OTC products available, clinicians should be well-equipped with the knowledge base to advise patients on the products best suitable for their skin.

Future Directions

Product development

There is a need to consider the unique characteristics of acne-prone Asian skin to identify better therapeutic strategies, management techniques and improve clinical outcomes.[17] OTC acne products targeting Asian skin should be suitable for sensitive skin, susceptible to post-inflammatory hyperpigmentation. Moreover, given the skin barrier disruptions observed in acne, there may be unique benefits of ceramide-containing cleansers and moisturizers for patients with this chronic, relapsing disorder.[27] OTC products targeted for acne-prone skin should also promote the maintenance of an acidic skin surface, which may help to ensure skin barrier integrity and reduce dry, irritated skin.[28,29] This can be achieved by the product being compatible with a pH of 4 to 5.

Education

Physicians and patients should be educated on the varied uses of OTC products for acne-prone skin (Figure 2). Educating physicians may encourage them to recommend these products to patients being prescribed acne treatments known to be topically irritating to help mitigate side effects, improve treatment compliance, and improve the effectiveness of prescription medications. Conversely, efforts to directly educate the general population on the proper use of adjunctive OTC acne care may be particularly important, as many acne sufferers self-manage their condition and do not consult with clinicians.[30,31] For example, a study on treatment-seeking behaviors showed that most Korean patients primarily sought skin care advice from different media outlets; and had a tendency to favor traditional medicine methods. Moreover, as acne treatment in Asia comes from various providers [e.g., dermatologists, primary care physicians, non-healthcare personnel (beauticians)], publishing recommendations for managing Asian patients with acne can be helpful to many professionals offering aesthetic and cosmetic care.[15] In fact, in many Asian countries, the proportion of dermatologists to the overall population is low; therefore, most patients are not managed by specialists. A survey of 200 participants revealed that 41% of acne sufferers use a moisturizer to cope with the unwanted side effects of their topical acne treatments.[32] Therefore, there are many non-medical care providers and patients that would benefit from the guidance of dermatologists regarding the armamentarium of OTC products.[15]

LIMITATIONS

Asians represent extensive populations that are not well defined. Relationships between age, skin type, geographical area, specific acne symptoms, skincare, and acne treatment are not extensively studied.

CONCLUSION

The advisors agreed that OTC products, such as cleansers and

moisturizers, should be considered for their adjunctive role in the armamentarium of acne treatment and maintenance strategies for Asian patients.

DISCLOSURES

The authors disclosed receipt of an unrestricted educational grant from CeraVe International for support with this work's research. The authors also received consultancy fees for their work on this project.

All authors contributed to the development and review of this work and agreed with the content.

REFERENCES

1. Rocha M, Sanudo A, Bagatin E. The effect on acne quality of life of topical azelaic acid 15% gel versus a combined oral contraceptive in adult female acne: A randomized trial. *Dermatoendocrinol.* 2017;9(1):e1361572.
2. Bhate K, Williams HC. Epidemiology of acne vulgaris. *Br J Dermatol.* 2013;168(3):474-85.
3. Vos T, Flaxman AD, Naghavi M, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet. 2012;380(9859):2163-96.
4. Tan JK, Bhate K. A global perspective on the epidemiology of acne. *Br J Dermatol.* 2015;172 Suppl 1:3-12.
5. Rocha MA, Bagatin E. Adult-onset acne: prevalence, impact, and management challenges. *Clin Cosmet Investig Dermatol.* 2018;11:59-69.
6. Hay RJ, Johns NE, Williams HC, et al. The global burden of skin disease in 2010: an analysis of the prevalence and impact of skin conditions. *J Invest Dermatol.* 2014;134(6):1527-34.
7. Gieler U, Gieler T, Kupfer JP. Acne and quality of life - impact and management. *J Eur Acad Dermatol Venereol.* 2015;29 Suppl 4:12-4.
8. Walker N, Lewis-Jones MS. Quality of life and acne in Scottish adolescent schoolchildren: use of the Children's Dermatology Life Quality Index (CDLQI) and the Cardiff Acne Disability Index (CADI). *J Eur Acad Dermatol Venereol.* 2006;20(1):45-50.
9. Gollnick H, Cunliffe W, Berson D, et al. Management of acne: a report from a Global Alliance to Improve Outcomes in Acne. *J Am Acad Dermatol.* 2003;49(1 Suppl):S1-37.
10. Dreno B, Thiboutot D, Gollnick H, et al. Large-scale worldwide observational study of adherence with acne therapy. *Int J Dermatol.* 2010;49(4):448-56.
11. Pawin H, Beylot C, Chivot M, et al. Creation of a tool to assess adherence to treatments for acne. *Dermatology.* 2009;218(1):26-32.
12. Francis NA, Entwistle K, Santer M, Layton AM, Eady EA, Butler CC. The management of acne vulgaris in primary care: a cohort study of consulting and prescribing patterns using the Clinical Practice Research Datalink. *Br J Dermatol.* 2017;176(1):107-15.
13. Angelova-Fischer I, Rippke F, Fischer TW, Neufang G, Zillikens D. A double-blind, randomized, vehicle-controlled efficacy assessment study of a skin care formulation for improvement of mild to moderately severe acne. *J Eur Acad Dermatol Venereol.* 2013;27 Suppl 2:6-11.
14. Enshaieh S, Jooya A, Siadat AH, Iraji F. The efficacy of 5% topical tea tree oil gel in mild to moderate acne vulgaris: a randomized, double-blind placebo-controlled study. *Indian J Dermatol Venereol Leprol.* 2007;73(1):22-5.
15. Abad-Casintahan F, Chow SK, Goh CL, et al. Toward evidence-based practice in acne: consensus of an Asian Working Group. *J Dermatol.* 2011;38(11):1041-8.
16. Sturm-O'Brien AK, Brissett AE, Brissett AE. Ethnic trends in facial plastic surgery. *Facial Plast Surg.* 2010;26(2):69-74.
17. Ho SG, Chan HH. The Asian dermatologic patient: review of common pigmentary disorders and cutaneous diseases. *Am J Clin Dermatol.* 2009;10(3):153-68.
18. Suh DH, Shin JW, Min SU, et al. Treatment-seeking behaviors and related epidemiological features in Korean acne patients. *J Korean Med Sci.* 2008;23(6):969-74.
19. Aramaki J, Kawana S, Effendy I, Happle R, Loffler H. Differences of skin irritation between Japanese and European women. *Br J Dermatol.* 2002;146(6):1052-6.
20. Choi JM, Lew VK, Kimball AB. A single-blinded, randomized, controlled clinical trial evaluating the effect of face washing on acne vulgaris. *Pediatr Dermatol.* 2006;23(5):421-7.
21. Choi YS, Suh HS, Yoon MY, et al. A study of the efficacy of cleansers for acne vulgaris. *J Dermatolog Treat.* 2010;21(3):201-5.
22. Dreno B, Bensadoun RJ, Humbert P, et al. Algorithm for dermocosmetic use in the management of cutaneous side-effects associated with targeted therapy in oncology. *J Eur Acad Dermatol Venereol.* 2013;27(9):1071-80.
23. Goh CL, Noppakun N, Micali G, et al. Meeting the Challenges of Acne Treatment in Asian Patients: A Review of the Role of Dermocosmetics as Adjunctive Therapy. *J Cutan Aesthet Surg.* 2016;9(2):85-92.
24. Draelos ZD. The art and science of new advances in cosmeceuticals. *Clin Plast Surg.* 2011;38(3):397-407, vi.
25. Peirano RI, Hamann T, Dusing HJ, et al. Topically applied L-carnitine effectively reduces sebum secretion in human skin. *J Cosmet Dermatol.* 2012;11(1):30-6.
26. Chularojanamontri L, Tuchinda P, Kulthanan K, Varothai S, Winayanuwattikun W. A double-blinded, randomized, vehicle-controlled study to access skin tolerability and efficacy of an anti-inflammatory moisturizer in treatment of acne with 0.1% adapalene gel. *J Dermatolog Treat.* 2016;27(2):140-5.
27. Thiboutot D, Del Rosso JQ. Acne Vulgaris and the Epidermal Barrier: Is Acne Vulgaris Associated with Inherent Epidermal Abnormalities that Cause Impairment of Barrier Functions? Do Any Topical Acne Therapies Alter the Structural and/or Functional Integrity of the Epidermal Barrier? *J Clin Aesthet Dermatol.* 2013;6(2):18-24.
28. Lynde C, Tan J, Andriessen A, et al. Clinical Insights About the Role of pH in acne. *J Drugs Dermatol.* 2019;18(12):221.
29. Lain E, Andriessen AE. Choosing the Right Partner: Complementing Prescription Acne Medication With Over-the-Counter Cleansers and Moisturizers. *J Drugs Dermatol.* 2020;19(11):1069-75.
30. Cheng CE, Irwin B, Mauriello D, Liang L, Pappert A, Kimball AB. Self-reported acne severity, treatment, and belief patterns across multiple racial and ethnic groups in adolescent students. *Pediatr Dermatol.* 2010;27(5):446-52.
31. Pawin H, Chivot M, Beylot C, et al. Living with acne. A study of adolescents' personal experiences. *Dermatology.* 2007;215(4):308-14.
32. Feldman SR, Chen DM. How patients experience and manage dryness and irritation from acne treatment. *J Drugs Dermatol.* 2011;10(6):605-8.
33. Munehiro A, Murakami Y, Shirahige Y, et al. Combination effects of cosmetic moisturisers in the topical treatment of acne vulgaris. *J Dermatolog Treat.* 2012;23(3):172-6.
34. Hayashi N, Kawashima M. Study of the usefulness of moisturizers *on adherence of acne patients treated with adapalene.* J Dermatol. 2014;41(7):592-7.
35. Matsunaga K, Leow YH, Chan R, Kerrouche N, Paliargues F. Adjunctive usage of a non-comedogenic moisturizer with adapalene gel 0.1% improves local tolerance: a randomized, investigator-blinded, split-face study in healthy Asian subjects. J *Dermatolog Treat.* 2013;24(4):278-82.
36. Chularojanamontri L, Tuchinda P, Kulthanan K, Pongparit K. Moisturizers for Acne: What are their Constituents? *J Clin Aesthet Dermatol.* 2014;7(5):36-44.
37. Bikowski J. The use of therapeutic moisturizers in various dermatologic disorders. *Cutis.* 2001;68(5 Suppl):3-11.
38. Angelova-Fischer I, Rippke F, Peirano RI, Hamann T, Dusing HJ, et al. Topically applied L-carnitine effectively reduces sebum secretion in human skin. *J Cosmet Dermatol.* 2012;11:30–6.
39. Andriessen A, Rodas Diaz AC, Gameros PC, Macias O, Neves JR, Gonzalez CG. Over the Counter Products for Acne Treatment and Maintenance in Latin America: A Review of Current Clinical Practice. *J Drugs Dermatol.* 2021;20(3):244-50.

AUTHOR CORRESPONDENCE

Anneke Andriessen
E-mail:..... anneke.a@tiscali.nl