Drug Therapies and Adjunctive Uses of Alphahydroxy and Polyhydroxy Acids

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In this article, I discuss the drug therapies and adjunctive uses of alphahydroxy acids (AHAs) and polyhydroxy acids (PHAs) for the treatment of several conditions—acne; aged, photoaged, or photodamaged skin; fungal infections; keratosis pilaris; melasma; postinflammatory hyperpigmentation; pretreatment and posttreatment for laser resurfacing; psoriasis; rosacea; seborrheic dermatitis; and xerosis. The number and variety of medically proven ingredients in these compounds allow dermatologists to design many methods of combining them with other topical treatments. Many different combinations can be designed, such as AHAs, PHAs, and an AHA/PHA blend (Table I). For instance, the following are examples of morning and evening combinations:

- Instead of having patients use an AHA twice a day, I may have them use an AHA once a day and a PHA once a day.
- I may have patients use a PHA cream in the morning and an AHA cream at night. I think that combining these products, rather than using one of them twice a day, produces better results (Table II).
- I have also combined daytime application of a protective PHA cream, which includes sun protection factor (SPF) and gluconolactone, with nighttime application of an AHA lotion, which contains 10% glycolic acid.
- In the morning, a patient can use a skin-lightening PHA cream consisting of gluconolactone, hydroquinone, and SPF; in the evening, the patient can use an AHA cream or lotion.

Table I.

The extensive and diverse variety and combination of medically proven ingredients allow the following compounds to be used in combination with other topical treatments:

- AHAs
- PHAs
- AHA/PHA blend
- Betahydroxy acids
- Combinations of above

Table II.

Combination Uses of AHAs/PHAs

AHAs With PHAs

- PHA cleanser with AHA/PHA acne products
- PHA cream with skin glycolic acid cream
- PHA (SPF 15) cream with glycolic acid lotion
- PHA cream and hydroquinone (SPF 15) with AHA cream/lotion

Combination Drug Therapies

To treat many of my patients, I use the technique of layering (*ie*, applying one product in the morning, another product in the evening, or one product over another). To treat *acne*, I perform glycolic acid peels. These peels should be done even with active acne, which is an important point for doctors to understand (many doctors, especially Eu-

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Table III.

Combinations With Drug Therapies

Acne
• Peels
• PHA cleansers
• AHA products followed by topical antibiotics (*eg*, glycolic acid solution followed by topical clindamycin phosphate or erythromycin)
• Combination of AHA/PHA products (*eg*, PHA cleanser with AHA/PHA acne treatment gel, AHA/PHA solution for back and chest with benzoyl peroxide and/or tretinoin)

ropean doctors, feel that active acne should not be peeled). Polyhydroxy acid cleansers are effective with acne cases. Alphahydroxy acid products can be followed with topical antibiotics (Table III). At this point, I use layering. For example, after a patient with acne washes her face, I have her wipe it with a glycolic acid solution, wait 10 to 15 minutes for it to dry, and then, if necessary, apply a topical antibiotic (*eg*, clindamycin, erythromycin) (Figure 1, A and B).

Alphahydroxy acids, PHAs, and combination products can be used simultaneously. The cleanser can be used twice a day. The patient should clean the skin, dry it, and apply the product. An AHA/PHA solution, excellent for the back and chest, can be followed with either benzoyl peroxide or tretinoin. Again, layering is involved (Figure 2, A and B). It is important to note that in my experience with Mediterranean olive complexions (type III), early treatment with peels and topical therapy decreases the incidence of postinflammatory hyperpigmentation in acne.

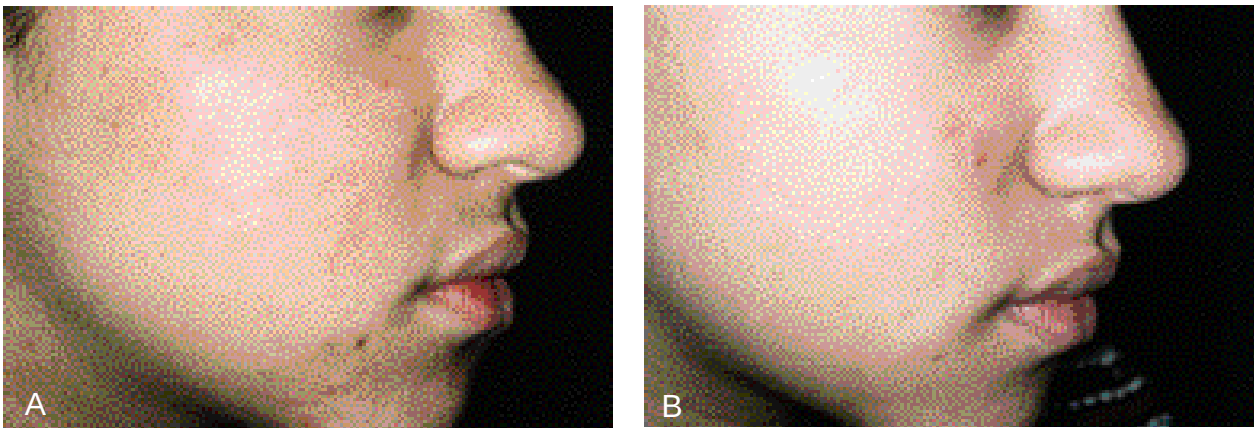


FIGURE 1. A young Hispanic woman pictured before (A) and after (B) acne treatment. In addition to clearing acne, the treatment prevented postinflammatory hyperpigmentation.

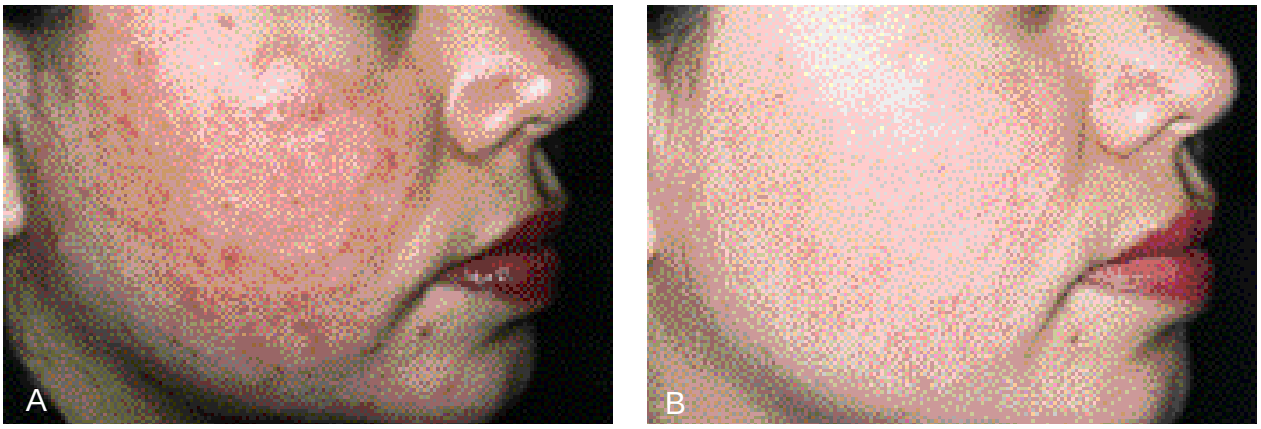


FIGURE 2. A young Hispanic woman with severe acne (A). The condition responded well to peels and layering of various products (B).

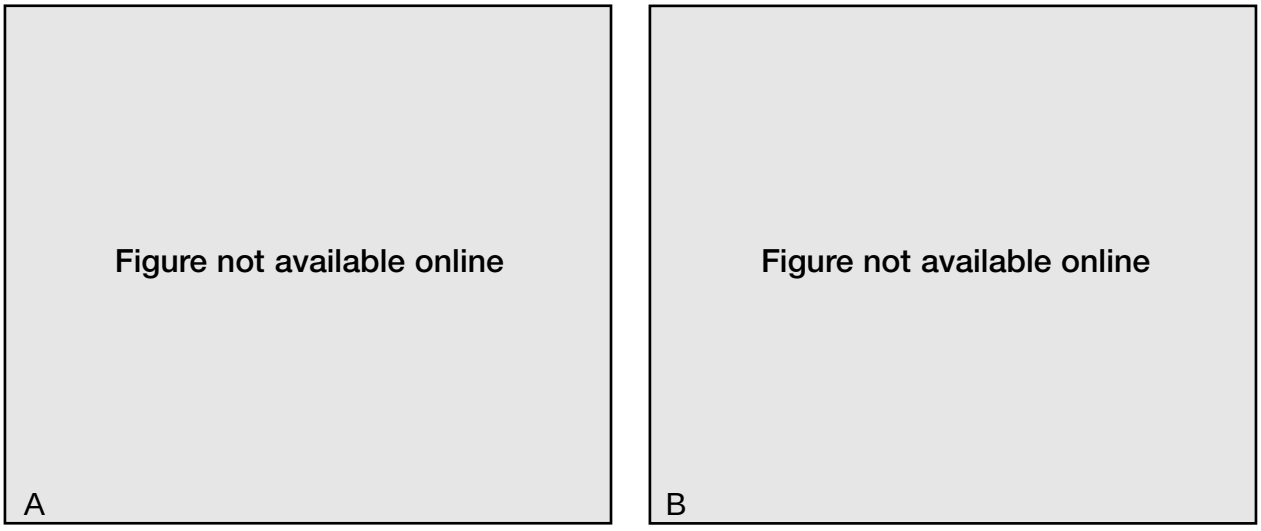


FIGURE 3. A young Mediterranean woman with severe scarring acne (A). The treatment cleared the acne and improved the scarring (B).

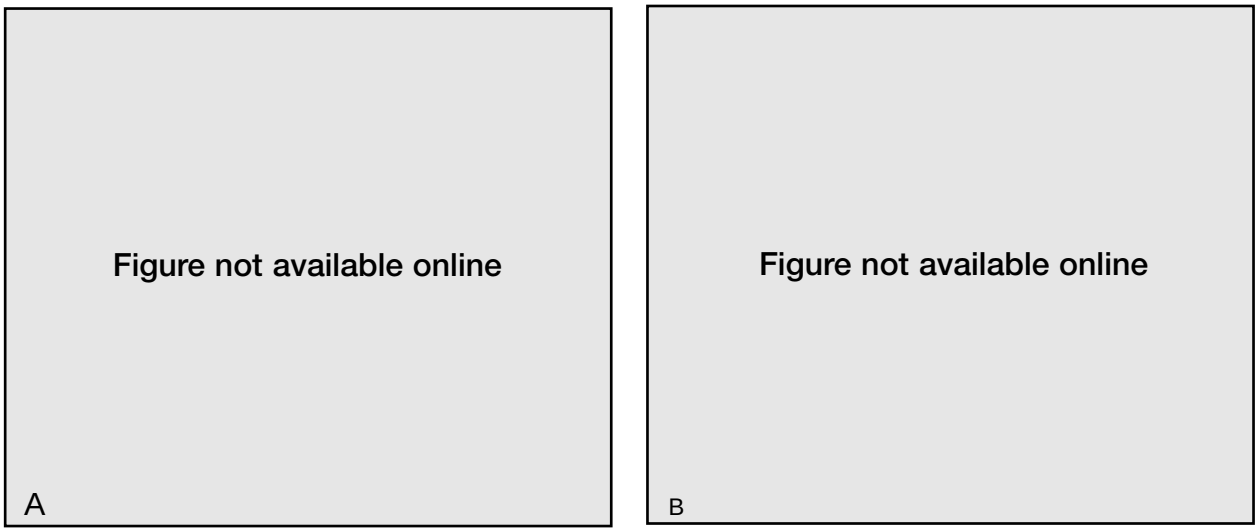


FIGURE 4. A Caribbean woman with melasma (A). The condition responded to low concentration peels and topical therapy (B).

For *seborrheic dermatitis*, PHA cleansers work very well. They can be followed with a mild topical steroid. For *rosacea*, PHA cleansers can be followed with Metrogel® or Noritate® cream (Figure 3, A and B). For *fungal infections*, the top, dead layers of the epidermis can be removed with AHA preparations, and then a topical antifungal cream can be applied (Table IV).

Melasma is treated with low-concentration peels. High-concentration peels should be avoided with melasma. An excellent home use combination is AHAs (or PHAs) with hydroquinone. In the morning, a PHA skin-lightening cream with SPF 15 can be used; and in the evening, a gel with hydroquinone and glycolic acid can be used (Figure 4, A and B). I have had excellent results with this combination. I also do peels on a regular basis. About 1 of every

Table IV.

Combinations With Drug Therapies

Seborrheic Dermatitis
• PHA cleansers followed by topical steroids
Rosacea
• PHA cleansers followed by Metrogel® or Noritate® Cream
Fungus Infections
• Use of enhanced AHAs with topical antifungals

Table V.

Combinations With Drug Therapies

Melasma
• Peels (low concentrations)
• AHA/PHA with Hydroquinone
Postinflammatory Hyperpigmentation
• Treated as above
• Preventive use of AHAs/PHAs with hydroquinone before and after procedures in skin types III, IV, and V

10 patients requires something stronger (*eg*, a stronger hydroquinone preparation, such as the Kligman formula). However, most of the time, the AHA/PHA/hydroquinone combination is more than adequate (Table V).

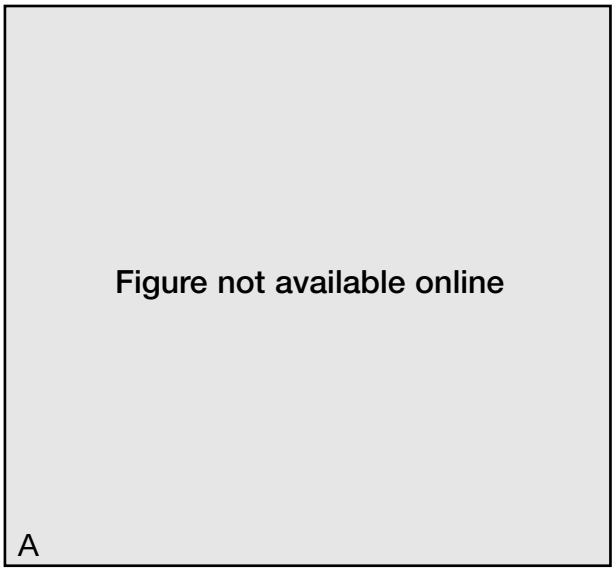
To reduce *postinflammatory hyperpigmentation*, I use a combination of AHA (or PHA) product with hydroquinone before and after procedures performed on Fitzpatrick type III through V skin (Figure 5, A and B). The hydroquinone/AHA (or PHA) product can be used for 2 to 4 weeks before a procedure.

To treat *keratosis pilaris*, either a skin moisturizing cream can be used once a day, or a high concentration AHA can be used once or twice a day. A tretinoin/steroid combination is good for bedtime. For *hand eczemas*, a PHA/vitamin cream can be used one to three times during the day, and a high-potency steroid cream can be used at bedtime.

In short, when we use AHA, PHA, or skin moisturizing treatments, we need not use steroids as much (we can go to lower potency steroids, and we can reduce the number of times we use them).

High-potency AHAs and skin moisturizing treatments are effective for the treatment of *xerosis*. A betahydroxy (BHA) mixture or salicylic acid in a petrolatum base can be used at night (it is greasy). During the day, a 15% AHA product can be used once or twice. For *psoriasis*, a 15% AHA cream or a skin moisturizing cream can be easily applied during the day; a typical psoriasis preparation (*eg*, potent steroid, calcipotriene cream, or tazarotene cream) can be applied at night (Table VI). For aged, photoaged, or photodamaged skin, glycolic acid peels, performed in a series of increasing concentrations, work well with combinations of topical creams. For these conditions, I prefer to use a PHA cream with an SPF cream in the morning, and an AHA cream at bedtime. For severe photodamage, high concentration AHA cream or topical tretinoin can be used as the bedtime treatment. In fact, alternating these bedtime treatments (*ie*, AHA high concentration cream one night and tretinoin cream the next) can be very synergistic.

I have added the very popular vitamin C antioxidants to my patients' regimens. I instruct most of my patients with aged skin to use four products—PHA cleanser, AHA cream, tretinoin cream, and vitamin C antioxidant cream (Table VII).



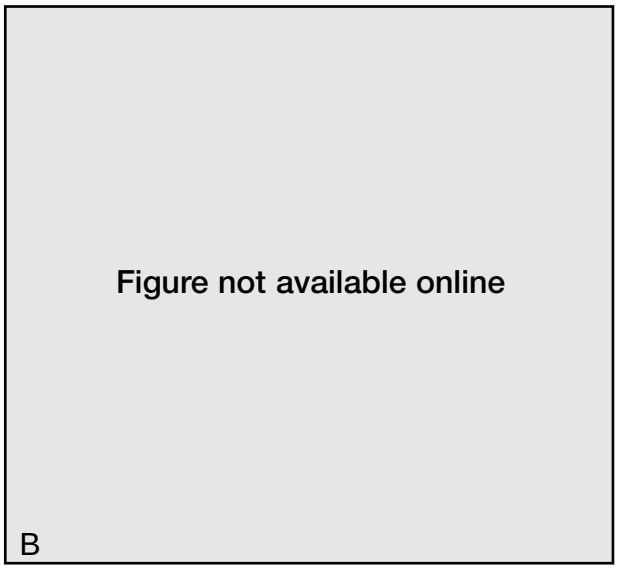


FIGURE 5. A Middle Eastern woman with postinflammatory hyperpigmentation (A). The condition responded well to peels and topical treatment (B).

Table VI.

Combinations With Drug Therapies

Keratosis Pilaris

- High potency AHAs/skin moisturizing cream one to three times daily with tretinoin/steroid combinations

Hand Eczemas

- PHA/vitamin cream one to three times daily with high potency steroid cream

Xerosis

- High potency AHAs and skin moisturizing cream
- BHA mixtures

Psoriasis

- AHA creams/skin moisturizing creams daily
- Steroid/Tazorac®/Dovonex®.

Table VII.

Combinations With Drug Therapies

Photodamage/Photoaging/Aging

- Peels—series with increasing concentrations
- Morning use of PHA/SPF creams
- Bedtime use of high concentration AHA creams
- Alternate use of topical tretinoin
- Addition of vitamin C/antioxidant products

Table VIII.

Combinations With Drug Therapies

Pre- and Postlaser Treatments

- Series of peels prior to treatment
- Regular use of AHA/PHA home use products before treatments
- AHA/PHA with hydroquinone before and after treatments in skin types III, IV, and V
- Continued use of AHA/PHA products after treatments (*ie*, sample European protocol)
- 50% glycolic acid peel 4 and 2 weeks prior to peel
- 70% glycolic acid peel immediately prior to resurfacing
- Hydroquinone AHA/PHA creams before and after laser

Table IX.

Adjunctive Therapies: Why Are They Effective?

- Desquamation of the stratum corneum
- Enhanced penetration
- Homeostasis of the epidermis
- Dermal responses
- Layering effect
- Synergistic action

Pretreatment and *posttreatment* for laser resurfacing include a series of prelaser peels; regular prelaser home use of AHA or PHA products; prelaser and postlaser use of AHA or PHA with hydroquinone for type III through V skin; and continued postlaser use of AHA and PHA products. Several of my colleagues in Greece give their patients a 50% glycolic acid peel 2 and 4 weeks before resurfacing and a 70% glycolic acid peel immediately before the laser treatment (they neutralize the peel and then begin resurfacing). This pretreatment protocol requires fewer passes with the laser and results in fewer complications (Table VIII).

Conclusion

Why are these therapies effective? Are we desquamating the stratum corneum of the epidermis and somehow enhancing penetration? Is glycolic acid creating a homeostasis of the epidermis? Is glycolic acid stimulating dermal responses? Is layering somehow involved? The answer appears to be yes to each of these possibilities, and it seems that there is a synergistic effect as well (Table IX). In order to better treat our patients, we dermatologists need to put each product into perspective, and determine which product combinations are safe and effective.