

Minimally Invasive Free Acid Glycolic Acid Peels Improve a Wide Range of Inflammatory, Pigmentary and Aging Skin Conditions

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Introduction

Minimally invasive cosmetic procedures continue to grow in popularity each year. **Within cosmetic procedures, chemical peels are consistently a top choice behind neurotoxin injections and soft-tissue fillers.** A review of recent scientific literature demonstrates a resurgence in the use of peels to help manage hyperpigmentation, particularly in dark-skinned patients.¹⁻⁴ Alpha-hydroxy acids (AHAs) are commonly used superficial peeling agents. AHA peels, also known as lunchtime peels, offer several advantages including minimal contraindications, the ability to control the duration and depth of the peel with a neutralization step, and little to no downtime for the patient. Free acid AHA peels allow maximum bioavailability to provide topical effects and benefits to the skin.⁵

Glycolic acid, an AHA, is a commonly used peeling agent due to its ability to modulate the process of keratinization, normalize stratum corneum exfoliation, and increase dermal biosynthesis of matrix components.⁶ **Citric acid**, an alpha/beta hydroxyacid, has been shown to improve hyperkeratosis associated with ichthyosis, increase collagen synthesis and increase the density of water-binding glycosaminoglycans, in addition to its well-known protective antioxidant effects.⁷ Citric acid has also been shown to significantly decrease melanin synthesis *in vitro*. **Mandelic acid**, a lipophilic AHA, has been shown to significantly increase procollagen and hyaluronic acid expression from fibroblast cells.⁸ Moreover, it can penetrate oily regions of the skin more effectively and has been found to have anti-bacterial properties, making it an ideal acid for acne-prone skin.⁹ Collectively, these effects benefit many different skin conditions including rosacea, acne, hyperpigmentation (including melasma) and photoaging.

Figure 1. Pigmentation, Clarity and Tone Improved After 2 Free Acid Glycolic Acid Peels in Conjunction With a Topical Treatment Regimen.



Baseline

After 2 Peels

Figure 2. Acne and Texture Improved. Patient Was Able to Discontinue Oral and Topical Prescription Acne Medications.



Baseline

After 6 Peels

Objective

A study was conducted to demonstrate the safety and effectiveness of free acid AHA peels with concomitant use of supportive home care products to improve a range of skin conditions in various ethnicities.

Study Methodology and Test Products

A series of **free acid glycolic acid peels** was administered at 3-4 week intervals as tolerated, over a period of several months. In some cases, a **targeted benefit peel** was administered in addition to the glycolic acid peel (Table 1). Standard peel procedures were followed including cleansing with a leave-on **pre-peel cleanser** to prepare the skin for the peel and application of petrolatum to protect any sensitive areas (lips, etc.). The skin was monitored for erythema and sensory discomfort and a **neutralizing solution** was used to terminate the peel based upon the skin's response to the peel and exposure time. Patients new to peels should begin at the lowest concentration (20%) before increasing to the next concentration, and glycolic acid peels are not recommended to exceed 5 minutes (7 minutes in combination with targeted benefit peels). **Homecare products** were provided as supportive care and were targeted to skin condition (Table 2).

After the series of peels, an overall clinical impression was provided by the dermatologist. Skin changes were visually captured using photography.

Table 1. Test Products – Free Acid AHA Superficial Peeling Agents Used in a Series of Peels

NeoStrata® ProSystem	Percentage of Free Acid	pH	Benefit
Rejuvenating Peel 1	20% Glycolic Acid	1.6	Targets rough texture, fine lines and wrinkles, discolorations, blemishes and mild keratoses
Rejuvenating Peel 2	35% Glycolic Acid	1.3	
Rejuvenating Peel 3	50% Glycolic Acid	1.2	
Rejuvenating Peel 4	70% Glycolic Acid	0.6	
Clarifying Peel (Targeted Benefit Peel)	20% Mandelic Acid 10% Citric Acid	1.6	Targets oily or acne-prone skin including superficial acne scarring or spots
Brightening Peel (Targeted Benefit Peel)	30% Citric Acid	1.6	Targets uneven pigmentation and discolorations such as photoaging induced dyschromia, sun spots and/or melasma

Results

The dermatologist noted significant clinical improvement in various skin conditions such as aging skin, melasma, rosacea, teen acne and adult hormonal acne. In addition, within these categories, various ethnicities were represented including Asian, Caucasian, African-American and Hispanic. All patients tolerated the peels well and were able to increase the glycolic acid concentration in subsequent peels.

Table 2. Case Studies With Dermatologist Clinical Impression of Improvement in Various Skin Conditions and Ethnicities

Demographics	Skin Condition	Peel Series (Table 1)	Concomitant Supportive Homecare Products	Dermatologist Clinical Impression of Improvement
Pigmentary Conditions				
African American female 34 years (Figure 1)	PIH	<ul style="list-style-type: none"> • 1 peel @ 35% • 1 peel @ 50% 	NeoStrata® <ul style="list-style-type: none"> • Facial Cleanser • Skin Lightening Cream • Daytime Protection Cream SPF • Ultra Moisturizing Face Cream • Topical corticosteroid for eczema 	Marked decrease in PIH. Improved clarity and tone.
African-American male 37 years	Hyperpigmentation & Oily-prone skin	<ul style="list-style-type: none"> • 1 peel @ 20% • 2 Brightening peels + 20% 	NeoStrata® <ul style="list-style-type: none"> • Antibacterial Facial Cleanser • Sheer Hydration SPF • Oily Skin Solution 	Improvement in hyperpigmentation and tone. Overall increased clarity and smoother skin.
Caucasian female 38 years	Melasma	<ul style="list-style-type: none"> • 1 peel @ 20% • 1 Brightening peel + 20% • 1 Brightening peel + 35% 	NeoStrata® Skin Active Regimen*	Notable fading of melasma on forehead and along jawline.
Inflammatory Conditions/Acne				
Asian male 21 years (Figure 2)	Acne & PIH	<ul style="list-style-type: none"> • 2 peels @ 35% • 3 peels @ 50% • 1 peel @ 70% 	NeoStrata® <ul style="list-style-type: none"> • Facial Cleanser • Acne Treatment Solution (2% Salicylic acid + 3% AHA) 	Discontinued oral antibiotic at 4th peel and azaleic acid at 6th peel. Marked improvement in acne and PIH, and in clarity and tone.
Asian female 15 years (Figure 3)	Teenage Acne & PIH	<ul style="list-style-type: none"> • 3 peels @ 20% • 1 peel @ 35% 	NeoStrata® <ul style="list-style-type: none"> • Facial Cleanser • Sheer Hydration SPF • Oily Skin Solution 	Decrease in acne lesions. Smoother texture.
Caucasian female 24 years (Figure 4)	Acne, PIH & Scarring	<ul style="list-style-type: none"> • 1 peel @ 35% • 3 peels @ 50% • 2 peels @ 70% 	NeoStrata® Skin Active Regimen*	Marked improvement of acne and PIH. Face virtually cleared. Patient happy with results.
Caucasian female 28 years	Acne, PIH & Scarring	<ul style="list-style-type: none"> • 1 peel @ 35% • 1 peel @ 50% • 3 peels @ 70% 	NeoStrata® Skin Active Regimen*	Marked improvement in PIH and mild scarring. No further acne breakouts. PIH and erythema faded dramatically. Patient very pleased with results – no longer requires acne medication.
Hispanic female 35 years	Adult Hormonal Acne & PIH	<ul style="list-style-type: none"> • 2 peels @ 20% • 1 peel @ 35% 	NeoStrata® Skin Active Regimen*	Improved texture, acne and erythema. Better clarity and tone.
Caucasian female 36 years	Inflammatory Acne & Rosacea	<ul style="list-style-type: none"> • 2 peels @ 35% • 2 peels @ 50% • 1 peel @ 70% 	NeoStrata® <ul style="list-style-type: none"> • Facial Cleanser • Daytime Protection Cream SPF • PHA Face Cream 	Sodium sulfacetamide lotion and oral antibiotic discontinued at 5th peel. Marked decrease in erythema and rosacea. Smoother texture.
Aging and Photodamage				
Caucasian female 65 years	Rosacea & Rhytides	<ul style="list-style-type: none"> • 1 peel @ 35% • 1 peel @ 50% • 2 peels @ 70% 	NeoStrata® Skin Active Regimen*	Marked improvement. Skin smoother with a decrease in fine lines and wrinkles. Erythema much less. Patient very pleased.
Caucasian female 66 years (Figure 5)	Fine lines & Wrinkles	<ul style="list-style-type: none"> • 1 peel @ 35% • 1 peel @ 50% • 2 peels @ 70% 	NeoStrata® Skin Active Regimen*	Significant improvement in texture, roughness. Improvement in deep rhytides and wrinkles noted around eyes.

PIH – Post Inflammatory Hyperpigmentation

*NeoStrata® Skin Active Regimen includes Exfoliating Wash, Matrix Support SPF, Cellular Restoration and Intensive Eye Therapy

Clinical Photography

- Photographs provide visual support for dermatologist and patient impression. Benefits to inflammatory, pigmentary and aging skin are apparent (Figures 1-5).

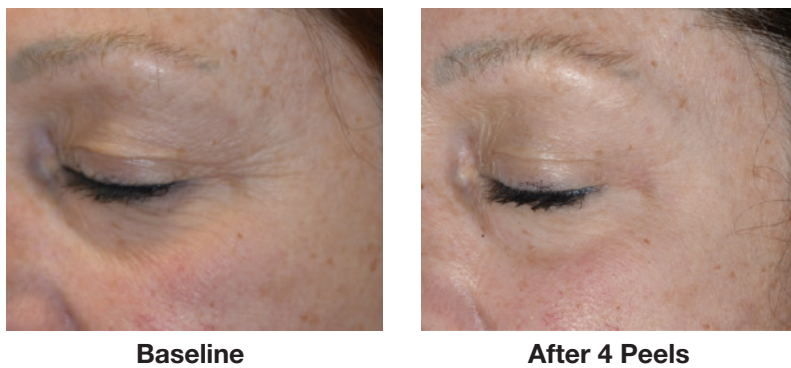
Figure 3. Improvement in Acne on the Forehead With Smoother, Clearer Skin.



Figure 4. Marked Improvement in Acne, PIH, Texture and Radiance. Patient Satisfaction was Achieved.



Figure 5. Deep Rhytides in Crow's Feet Area and Fine Lines Along Zygomatic Arch Are Improved.



Conclusions

- Clinically significant improvements were observed during the course of the peels in patients of varying ethnicity and skin conditions such as teenage acne/acne scarring, adult hormonal acne, photodamage, rosacea and hyperpigmentation.
- The peels were well tolerated in all patients.
- The free acid, AHA peels were found to be safe and effective on different skin types and conditions.
- The benefits of free acid AHA peels for skin texture, pigmentation, clarity and radiance can be combined with cosmetic procedures to provide complementary therapy, particularly for those procedures with no effect on skin quality such as neurotoxin injections and soft-tissue fillers.

References

1. Javaheri SM, Handa S, Kaur I, Kumar B. Safety and efficacy of glycolic acid facial peel in Indian women with melasma. *Int J Dermatol.* 2001;40(5):354-7.
2. Grimes PE. Glycolic acid peels in Blacks. In: Moy R, Luftman D, Kakita L, eds. *Glycolic acid peels.* New York, NY: Marcel Dekker, 2002; pp179-186.
3. Rivas S, Pandya AG. Treatment of melasma with topical agents, peels and lasers: an evidence-based review. *Am J Clin Dermatol.* 2013;14(5):359-76.
4. Sarkar R, Bansal S, Garg VJ. Chemical peels for melasma in dark-skinned patients. *J Cutan Aesthet Surg.* 2012;5(4): 247-253.
5. Yu RJ, Van Scott EJ. Bioavailable alpha hydroxy acid in topical formulations. In: Moy R, Luftman D, Kakita L, eds. *Glycolic acid peels.* New York, NY: Marcel Dekker, 2002; pp15-28.
6. Bernstein EF, Lee J, Brown DB, Yu RJ, Van Scott EJ. Glycolic acid treatment increases type I collagen mRNA and hyaluronic acid content of human skin. *Dermatol Surg.* 2001;27(5):1-5.
7. Bernstein EF, Underhill CB, Lakkakorpi J, Ditre CM, Uitto J, Yu RJ, Van Scott EJ. Citric acid increases viable epidermal thickness & glycosaminoglycan content of sun-damaged skin. *Dermatol Surg.* 1997;23:689-94.
8. Data on file. NeoStrata Company, Inc., 2013.
9. Taylor MB. Summary of mandelic acid for the improvement of skin conditions. *Cosm Dermatol.* 1999;21:26-28.