

CHEMICAL PEELS - A POPULAR EVOLUTION IN COSMETOLOGY- AN UPDATED REVIEW

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ABSTRACT

Chemical Peels, a type of cosmetic procedure that has been increasingly used in today's time for conditions like treating acne, acne scars, facial wrinkles, skin tightening etc. Depending upon the depth of penetration, different types of peels are used. The selection criteria vary in other patients and carried skin textures. Selection of appropriate peel single or in combination gives better results. This review article is written to provide an insight into the evolution of chemical peels over time.

KEYWORDS: Salicylic acid, acne, chemical exfoliation, trichloroacetic acid.

INTRODUCTION

An acne skin condition characterized by blockage of skin pores by sebum, hair, dust particles and bacteria has been labelled as the eighth commonest disease according to The Global Burden of Disease Study 2010. It has a global prevalence of 9.38% in all ages.^[1] Commonly seen on the face, neck, back and trunk in the form of blackheads, whiteheads, papules and pustules and sometimes cyst.^[2] This is a condition that necessitates all ages to consult a dermatologist, preferably for cosmetic reasons.

For several years, numerous treatments have been tried for acne, like medicated soaps containing salicylic acid, sulphur containing cleansers, creams and gels containing benzoyl peroxide, as well as topical and systemic retinoids.^[3] This is also accompanied by the use of a range of home remedies like aloe vera gel, cucumber, neem, tea tree oil etc. by many people.^[4] The use of other therapies such as comedone extraction, chemical peeling, intense pulse light laser therapy and cryoslush, are other newer methods increasingly used these days.^[5]

Over the years, chemical peels have revolutionized the treatment of acne and acne scars. It is often termed as chemabrasion, chemical exfoliation, chemical face lifting, derma peeling, facial rejuvenation and surface surgery.^[6] The technique basically causes

keratocoagulation or keratolysis of the part of the skin's surface by the application of chemical ablative agents, thereby causing exfoliation of the layers and subsequent wounding and remodelling of the skin.^[7] It improves skin texture along with treating skin lines and actinic keratosis, pigmentary disorders and helps in rejuvenating the skin.^[8] For the best outcome, it is required to select the proper peel, according to the patient and on the basis of depth of penetration. Hence, it mandates the understanding of different types of peels. Chemical peels are fast, effective and safer; therefore also used in adjunct with topical or systemic retinoids for better results.

The evolution of cosmetic dermatology has revised the concept of beauty and paved a new way of skincare in modern times, one form of which is chemical peels. This article thus gives the latest and updated review on chemical peels.

Background of Chemical peels: The use of chemical peels dates back to Egyptians time, as studies show that they used sour milk, animal oils, salt, honey etc., for bathing to smoothen their skin. The use of phenols for acne scars, to lighten the skin, croton oil for inflammatory conditions, an alcohol-based solution with lactic acid, salicylic acid have all evolved over time as chemical peels.^[9] Coleman III and Futrell in 1994 used

glycolic acid 75% and TCA 35% for medium-depth peeling.^[10] Thus, has evolved chemical peels as one of the most popular cosmetic procedures for skin today. Chemical peels are selected according to the depth of

penetration into superficial, medium-depth and deep subtypes. The depth of peeling depending upon pH, concentration and type of peel used.^[11] The gist of the kinds of chemical peels is summarized in table 1.

Table 1: Type of peels.

Type of Peel	Target depth	Details
Superficial	Light (Stratum spinosum)	<p>Glycolic acid 20-50%- Widely used, α-hydroxy acid, excellent exfoliative properties, studies claim of anti-inflammatory effect on acne.^[12,13]</p> <p>Salicylic acid 20-30%- β-hydroxy acid, Best keratolytic agent, better penetration, strong comedolytic effect in the treatment of acne, lightening effect in post-inflammatory acne, safer to use and cost-effective.^[14,15]</p> <p>Citric acid</p> <p>Mandelic acid</p> <p>Vitamin A compounds: Used owing to the properties of retinol, reduces collagenase and increases collagen.^[16]</p> <p>Jessner's solution: used in combination with other peels to increase the depth of penetration, contains resorcinol (14%), lactic acid (14%), salicylic acid (14%) and ethanol. Used with caution due to resorcinol/burning effect. Studies also suggest the role of this peel as preparatory peel.^[17,18]</p>
	Deeper (Entire epidermis)	<p>Glycolic acid 70%</p> <p>Trichloroacetic Acid (TCA) 10-30%- Causes coagulation of epidermal and dermal proteins and necrosis of collagen up to upper reticular dermis. It is a self neutralising peel hence can be used in high concentrations. It is additionally used in combination with different peels.^[19, 20]</p>
Medium	Upper reticular dermis	TCA 35-40%
Deep	Mid reticular dermis	Phenol -It causes complete epidermolysis and dermal elastolysis. A solution containing 88% phenol is used as peel. It has significant side effects like arrhythmias; kidney and hepatotoxicity due to systemic absorption, hence need to be used cautiously. ^[21, 22]

Superficial peels are first hand used timely for mild conditions like hyperpigmentation, fine lines, wrinkles, dull skin, mild acne, whereas medium depth peels are used additionally for treating actinic keratosis, post-inflammatory hyperpigmentation and deep peels are used for deep acne scarring in addition to the above mentioned.^[23,24]

General Principles/ Patient selection: Patients should be properly counseled before beginning the treatment as many patients have unrealistic expectations and can cause trouble for themselves as the dermatologist post-therapy; also, compliance is an important factor post-therapy. Any history of cardiac, renal, hepatic disease, recent facial surgery or any allergies should be ruled out. High-risk patients like those having diabetes, immunocompromised, pregnant females, patients on isotretinoin for the prior six months should be avoided to avert any otherwise medical complications.^[25] Herpes simplex infection should be checked for, and if present prophylactic treatment should be advised.^[26] History of smoking should be enquired about and asked to discontinue as it has harmful effects on skin remodelling. Also, history of any radiotherapy, drug intake or other inflammatory disorders should be ruled out.

Patients skin colour should be assessed using the Fitzpatrick skin phototype scale^[27] as described in table 2. Studies show that medium and deep peels are unsafe for Fitzpatrick skin type V or VI as they cause depigmentation and scarring but give better results with Fitzpatrick skin type I to IV.^[28] After informed consent, photographs should be taken for pre and post-treatment completion. As a part of priming, before the peel, which enhances the peel penetration by thinning stratum corneum, several studies reveal that prior treatment with topical tretinoin for 2-4 weeks improves penetration and increases healing time,^[29] use of emollients for re-epithelization, use of sun-screen ultraviolet (UV), UV-A and UV-B with sun protecting factor (SPF) 30 should be used. However, some studies suggest that post-inflammatory hyperpigmentation can be avoided using by priming with 2-5% hydroquinone as it has shown better results as compared to tretinoin.^[30] Patients are advised to avoid bleach, wax, scrub, massage at least one week prior to the peel.

Table 2: Fitzpatrick scale.

Skin type	Skin colour	Tanning
I	White	Always burns, never tans
II	White	Usually burns, tan with difficulty
III	White	Sometimes mild burn, tan average
IV	Moderate brown	Rarely burns, tan with ease
V	Dark brown	Very rarely burn, tan very easily
VI	Black	No burn, tan very easy

Although superficial peels are better suited for all Fitzpatrick skin phototypes studies, they reveal that it is best to use superficial peels of younger patients with fine lines and dyschromia.^[31] Females with fair complexion, blue eyes, dry skin are better candidates for medium and deep-depth peels.^[32] The role of test-spot testing remains controversial, as though it benefits by giving a clue regarding peel penetration, healing time, post-peel complications, post-inflammatory hyperpigmentation, relieves patient's anxiety; however, it also increases the time of treatment, sometimes gives non-reliable results and also the test-spot persists till the treatment of the area is completed.^[33,34]

Peeling techniques: Proper positioning of the patient is essential; relaxing the patient helps perform the method better. General anaesthesia is required for phenol peels. Depending upon the agent used, a brush or wooden spatula is used for application. It starts with the thicker areas of the face, peels are applied in an upward direction, and the feathering technique is used at the end to avoid demarcating lines. Post peel care should be explained to the patient properly for better outcome.^[35,36,37]

Combination methods: Chemical peels, when used in combination with other cosmetic techniques, gives a greater facial glow. These include the use of microdermabrasion, micro-needling, ablative laser resurfacing, dermal fillers and botulinum toxin A (Btx-A) injections. Though studies show, it is best to use (Btx-A) prior to peeling.^[38,39]

The combination of peels has also given good results, according to some studies like the use of solid CO₂ plus TCA 35%, JS plus TCA 35%, and GA 70% plus TCA 35% as medium depth peel.^[40] Brody peel, Monheit peel, Coleman peel, segmental peeling are the other medium-depth peels commonly used.^[41] Studies have shown that the use of Jessner's solution plus 35% TCA has shown a decrease in acne scarring.^[42] For the treatment of acne, the use of combined chemical peel and topical salicylic acid-based gel combination has also been tried with the best results.^[43]

Side effects and complications: An experienced person, with proper pre-peeling treatment, appropriate selection of peel and good patient compliance when to go together, there are very fewer chances of complications. However, a few like irritation, blisters and pruritus over the area may occur.^[44] Studies show that acne/folliculitis have

been very common side effects so as persistent erythema, burning etc. Some may develop pigmentary changes, scarring etc.^[45] Systemic complications are less reported.

Recent advances- Studies show that conventional peeling agents in combination with vitamins, botanical extracts are increasingly becoming popular, called Boutique or pamper peels.^[38] β - lipo hydroxy acid, a derivative of salicylic acid, has been tried as a superficial peel; however, comparisons with other peels is still required.^[46] Salicylic-mandelic acid has also been tried with good results.^[47] Amino fruit acids have also been increasingly used; however, studies in dark skin individuals are still required.^[48,49] Studies have also shown the use of Phenol croton oil peel has been used with much better results on the face and neck area, with croton oil being used in varying concentrations to avert the possible serious side effects.^[50]

CONCLUSION

Chemicals peels are the best, safe and cost-effective treatment of skin rejuvenation and also the treatment of acne, acne scars and melasma available in modern times. This paper provides an overview of chemical peels that are increasingly used these days while newer chemical peels are evolving. We have tried to provide the latest and updated information to the best of our knowledge on chemical peels. This will help the dermatologist in selecting the appropriate peel. However, more research and comparative data are still required to categorize the peels on the basis of effectiveness and minimal complications for different skin types for better patient outcomes.

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