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Glycolic Acid (GA) Peel versus Dermapen in Management of Acne Scars Among Egyptian Patients: A Comparative Study

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ABSTRACT

Background: A relatively recent minimally invasive technique, microneedling involves rolling tiny, thin needles to puncture the dermal superficially and precisely, used historically as a collagen induction therapy for face scars and dermal renewal especially scars from acne.

Objective: To assess and contrast dermapen, glycolic acid (GA) peel, and a combination of the two therapies' safety and effectiveness in treating acne scars.

Cases and methods: Thirty cases with acne scars participated in this trial, ten cases each. Cases were divided into three cohorts at random; cohort I had dermapen therapy, whereas cohort II received glycolic peel therapy. Both procedures were administered to Cohort III. Six sessions were given to each case at intervals of two weeks. The quartile grading scale, the degree of case satisfaction, and the qualitative global scar grading system before and after therapy served as the foundation for the clinical evaluation.

Results: The degree of acne scars before and after therapy with the dermapen and glycolic acid peel cohorts did not significantly improve. The degree of improvement did not differ statistically significantly between the cohorts. The severity of the acne scar was improved following dermapen and glycolic acid peel therapy.

Conclusion: When it came to treating atrophic acne scars, neither dermapen nor glycolic acid peel worked as a monotherapy. However, the severity of the acne scar significantly improved when combined with one another.

Keywords: Atrophic acne scars, Glycolic acid peel, Dermapen, Microneedling.

INTRODUCTION

Depending on how it progresses, acne vulgaris is a chronic dermal condition that manifests as dermal eruptive events such open and closed comedones [1].

Over 80% of teenagers, 50% to 60% of women in their 20s and 25s, and 12% of women over 25 experience it. The condition is brought on by bacterial infection, increased sebum production, and dermal inflammatory and hormonal abnormalities [2].

Acne cases feel dermal blistering and itching throughout the duration of the condition. People who suffer from severe kinds of acne are more likely to get acne scars, which lowers their quality of life. Cases frequently experience social isolation, anxiety, shame, and embarrassment, which can result in despair and even suicide thoughts [3].

It might be difficult to treat acne scars because there are a lot of elements to take into account. Among these are the many kinds of scars; the most prevalent ones are rolling, boxcar, and ice pick scars. The degree of scarring is another crucial factor. Along with the severity of the lesion, other factors include the case's expectations, side effects, therapy costs, and psychological impacts. Combination therapy can produce fruitful and fulfilling results. The most effective way to reduce acne-related scarring is still to manage aggressive acne early [4].

A relatively recent minimally invasive technique, microneedling involves rolling tiny, thin needles to puncture the dermal superficially and precisely, used historically as a collagen induction therapy for face scars and dermal renewal especially scars from acne [5].

Controlled keratocoagulation through the skin is the result of medium-depth chemical peels. These result in more profound regenerative alterations that can address disease in the superficial dermis as well as the epidermis. Mild to moderate acne scars have been treated with 70% GA, which produces medium-depth peels [6].

There aren't many well-conducted studies, though, that compare glycolic peels and microneedling for treating acne scars in Egyptian cases. In order to control acne scars, we therefore sought to assess and contrast the safety and effectiveness of GA acid peel, dermapen, and a combination of the two procedures.

CASES AND METHODS

Our research included both male and female cases with acne scars of any age.

Our research excluded individuals having a history of bleeding problems, contact dermatitis, glycolate hypersensitivity, or inflammatory or infectious dermal conditions, therapy with anticoagulants, dermal cancer, pregnancy, herpes simplex infection, solar keratosis, keloids, and uncontrolled diabetes. Our research excluded also cases with neuromuscular disorders, keloid-prone cases, and collagen vascular disease.

Three cohorts of cases were formed: Cohort I consisted of ten cases who had dermapen microneedling to heal their scars. Ten cases in Cohort II received GA 35% peel therapy. Ten cases in Cohort III had a GA 35% peel in addition to dermal microneedling using a dermapen. All three cohorts' cases had six therapy’**s** sessions, with a two-week gap between each 2 sessions. Cases were monitored for a month.

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Cohort I: To optimize dermal collagen synthesis, we primed the cases twice daily for two weeks with topical vitamin A and C formulations. We modified the method that **Ibrahim *et al.*** [7] described. Dermapen (Bomtech Electronics, Seoul, Seocho-gu, Korea) was used for the microneedling procedure (34, Hyoryeong-ro 49-gil, Seocho-gu, Seoul, JX-120DR). For around 45 to 60 minutes before to the therapy, a thick layer of EMLA cream (a eutectic mixture of lidocaine and prilocaine), manufactured by APP Pharmaceuticals, Fresenius Kabi, San Francisco, IL, USA, was applied to the face. The cream was carefully taken off. Six sessions of dermapen were conducted every two weeks. It was passed with little pressure in several directions. Following therapy, we recommended topical antibiotics twice daily for three days, along with daily application of an appropriate sunscreen.

Cohort II (35% GA): Care Mid East Pharma Company (Elmansoura, Ad Daqahliyah, Egypt) manufactured the GA peel 35% weight/volume on demand for the cases in this cohort. Two weeks before the peel, our cases were prepped at home with light topical peeling agents (tretinoin 0.025%), which they stopped two days before the therapy. For a chemical peel to be applied evenly and produce a consistent outcome, the skin must be well cleaned before the procedure. After instructing the cases to wash their faces with soap and water, we scrubbed the dermal surface to get rid of any last remnants of oils or makeup.

Cohort III: For six sessions, dermapen and GA 35% were administered alternately to cases in this cohort every two weeks.

We cleaned the skin with ethyl alcohol and degreased it with acetone. We requested the cases to keep their eyes closed throughout the entire process while they were comfortably seated and wearing a hair cap. We used an applicator with a cotton tip to apply the acid. Since the forehead is less sensitive than other areas of the face and can withstand a bit more exposure to the acid, we apply the GA there first before moving on to the rest of the face.

We used Vaseline to protect really delicate regions like the lips and nose corners. When a consistent erythema (endpoint) appeared after three to five minutes, we neutralized the peel. If frosting was seen in any place before the end time or fixed time, we used sodium bicarbonate to neutralize it simultaneously. Cases were told to use a good sunscreen, topical antibiotics, and moisturizing lotion every day.

At the conclusion of therapy, the quartile grading scale and Goodman and Baron's qualitative global scar grading system were used to evaluate the outcomes.

Ethical approval:

The research was approved by the local Ethical Committee: Institutional Research Board (IRB) of Menoufia Faculty of Medicine (HSH00097) and all methods were performed in accordance with the ethical standards as laid down in the Declaration of Helsinki and its later amendments or comparable ethical standards. Written informed consent was obtained from all adult participants and from the legal guardians of children participants.

Statistical analysis

On an IBM compatible computer, SPSS (Statistical Package for the Social Sciences software) version 22 was used to tabulate and analyze the acquired data. The chi-square test (X^2) was used to compare two independent qualitative variables. P vale <0.05 was considered significant.

RESULTS

At baseline, there was no discernible difference between the cohorts under research (Table 1).

Table (1): Comparison between studied cohorts regarding severity at baseline:

			Cohort			Total	X^2	P- value
			Glycolic acid	Dermapen	Glycolic acid and Dermapen			
Severity	Mild	No	4	4	4	12	0.00	1.00
		%	40.0%	40.0%	40.0%	40.0%		
	Moderate	No	3	3	3	9		
		%	30.0%	30.0%	30.0%	30.0%		
	Severe	No	3	3	3	9		
		%	30.0%	30.0%	30.0%	30.0%		
Total		No	10	10	10	30		
		%	100%	100.0%	100.0%	100.0%		

Following therapy, no discernible change between the cohorts under research was found (Table 2).

Table (2): Comparison between studied cohorts regarding severity after therapy.

			Cohort			Total	X^2	P- value
			Glycolic acid	Dermapen	Glycolic acid and Dermapen			
Severity	Mild	No	5	3	5	13	1.62	0.806
		%	50.0%	30.0%	50.0%	43.3%		
	Moderate	No	2	4	2	8		
		%	20.0%	40.0%	20.0%	26.7%		
	None	No	3	3	3	9		
		%	30.0%	30.0%	30.0%	30.0%		
Total		No	10	10	10	30		
		%	100.0%	100.0%	100.0%	100.0%		

Following dermapen therapy, no discernible change was seen (Table 3).

Table (3): Assessment of response to therapy in dermapen cohort.

			Dermapen		X^2	P- value
			Pre	Post		
Severity	Mild	No	4	5	6.31	0.097
		%	40.0%	50.0%		
	Moderate	No	3	2		
		%	30.0%	20.0%		
	Severe	No	3	0		
		%	30.0%	0.0%		
	None	No	0	3		
		%	0.0%	30.0%		
Total		No	10	10		
		%	100.0%	100.0%		

Following therapy with glycolic acid peel, no discernible change was seen (Table 4).

Table (4): Assessment of response to therapy in glycolic cohort.

			Glycolic acid		Total	X^2	P- value
			Pre	Post			
Severity	Mild	No	4	3	7		
		%	40.0%	30.0%	35.0%	6.29	0.99
	Moderate	No	3	4	7		
		%	30.0%	40.0%	35.0%		
	Severe	No	3	0	3		
		%	30.0%	0.0%	15.0%		
	Non	No	0	3	3		
		%	0.0%	30.0%	15.0%		
Total		No	10	10	20		
		%	100.0%	100.0%	100.0%		

Following dermapen therapy in conjunction with a glycolic acid peel, the severity of acne scarring significantly improved (Table 5).**Table (5):** Assessment of response to therapy in dermapen plus glycolic cohort.

			Glycolic acid and Dermapen		Total	X^2	P- value
			Pre	Post			
Severity	Mild	No	5	3	8	9.5	0.023*
		%	50.0%	30.0%	40.0%		
	Moderate	No	1	3	4		
		%	10.0%	30.0%	20.0%		
	Severe	No	4	0	4		
		%	40.0%	0.0%	20.0%		
	Non	No	0	4	4		
		%	0.0%	40.0%	20.0%		
Total		No	10	10	20		
		%	100.0%	100.0%	100.0%		

**: Significant*

DISCUSSION

Chemical peels are regarded as an adjuvant therapy for treating all types of acne and its aftereffects, and they play a significant role in modern dermatology practice. Acne scars have historically been treated with medium-depth chemical peels, such as TCA and GA, either by themselves or in conjunction with other therapies [8].

Concentrations of GA peels range from 20% to 70% [9]. It functions as a medium-depth peel at 70% concentration. By decreasing keratinocyte clogging and corneocyte adhesion at the stratum granulosum level, GA functions as an exfoliating agent and causes dermal desquamation. Furthermore, it results in the dispersion of melanin and thicker skin layers with enhanced production of collagen and mucopolysaccharides [10].

There were six sessions, one every four weeks, which was more than what **Chawla** [11] **and Nofal *et al.*** [12] had done and close to the average research durations and session intervals done by **Majid** [13]**, Dogra *et al.*** [14]**, Leheta *et al.*** [15] **and El-Domyati *et al.*** [16]**.**

There was no discernible difference in severity between the cohorts under research at baseline.

According to the current research, there was no statistically significant difference in the severity of acne scars before and after therapy between the dermapen and glycolic acid peel cohorts. The degree of improvement did not differ statistically significantly between the cohorts.

In contrast to our findings, 30 cases with acne scars were studied by **Saadawi *et al.*** [17]**.** Ten cases each were divided into three cohorts at random; cohort I received GA peel therapy, whereas cohort II received microneedling. Both procedures were administered to Cohort III. The cohorts' levels of progress differed statistically significantly from one another

Dermapen was utilized by **Ibrahim *et al.*** [7] to treat atrophic scars. All of the cases in the dermapen cohort improved in the research; non-acne scars responded better than acne scars, while the difference was not statistically significant.

Additionally, **Mujahid *et al.*** [18] demonstrated that microneedling improved the look of acne scars.

Sharad's [19] research assessed the effectiveness of a 35% GA peel as a microneedling adjuvant for acne scars in Indian cases. When GA peel was added, they saw a noticeably higher improvement, suggesting that GA peeling promoted neocollagenesis and had an additive impact. Superior results were seen by the combo cohort in another randomized controlled experiment that contrasted microneedling alone with 35% glycolic peel [17].

In a trial involving 60 cases, **Rana *et al.*** [20] also found that scar improvement is superior to microneedling alone when a still higher concentration of 70% GA peel was added. The number of boxcar scars was significantly improved by both peels in an open-label, non-randomized trial comparing 35% GA to a 20% salicylic acid–10% mandelic combination peel; however, rolling scars were not significantly affected, and icepick scars were very slightly affected [21]. The authors came to the conclusion that GA peeling is a successful therapy for atrophic acne scars after evaluating the serial concentrations of GA peels (20%, 35%, 50%, and 70%) against 15% GA cream once or twice daily for 24 weeks in a single-blind, placebo-controlled, and randomized comparative clinical research [22].

The current research found that using dermapen in conjunction with a glycolic acid peel significantly reduced the degree of acne scarring.

Consistent with our results, **Sharad** [19] evaluated microneedling with glycolic acid peel using the ECCA score without mentioning the kinds of scars. The mean V scar score began to decline after the second session, and the U and M scar values began to decline after the third. By the end of the trial, there had been a considerable improvement in the V and U scar scores.

CONCLUSION

Our research concluded that, when used as a monotherapy, dermapen and glycolic acid peels had no effect on the therapy of atrophic acne scars. But when combined, they demonstrated a superior response.

Conflict of interest: None.
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