

ORIGINAL ARTICLE

The Comparison of Treatment Efficacy and Outcomes of Microneedling and Glycolic Acid Peels for Acne Scar

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Approximately 9.4% of the global population is affected by the acne. It is one of the most prevalent type of disease around world. Acne scars are produced after a severe attack of acne. The scarring frequently results from the prevalent disease known as acne vulgaris. Acne scar also effect the psychosocial and emotional state of the patients¹⁻². The physical disfigurements are the ultimatum of acne scar. To minimize the scarring effects the early and effective treatment is required. Acne scar are also associated with the number of complications such as dyspigmentation and post-inflammatory hyperpigmentation. One of the major complications associated with acne vulgaris is atrophic acne scarring. The acne vulgaris impact the quality of life³.

The minimally invasive technique for the rejuvenation of skin is microneedling. It is a most popular modality. Acne scar is reported in almost 80% of the young population around the world. The textural changes in the deep and superficial dermis are highly observed in the patients. The post inflammatory responses leads to post acne scars. According to the basic classification system the scars are classified into rolling, icepick and box scars⁴⁻⁵. The currently dermatologists are using different techniques for the treatment of the post acne scars. The enhancement of the extracellular matrix proteins are usually done to treat the post acne scars. The needle is used to break the collagen bundles present in the superficial layer of dermis. This collagen bundles are the reason for the scars. The skin is being punctured by the needle for many times to break the collagen. The fine shaped needle roller is used for this purpose. Fernandes designed this needle. Skin microneedling is a widely used technique. The outcomes of the skin microneedling are highly dependent upon the physician subjective estimate⁶. Asian women (30%) face the acne scar issue more than Caucasian women. Microneedling is an effective treatment for the acne scars. It is considered as a much better approach used for removal of acne scars also stating it as better option. It is used to improve the cutaneous scarring appearance. These lead to the remodeling of the collagen and thickening of dermis. The small channels form during skin needling improves the absorption.

Glycolic acid peel is another therapy used to treat the acne scars. These are time-tested. The most commonly used alpha hydroxyl acid peel is glycolic acid peel. These are also known as fruit peel. These are cost-effective and simple. The efficacy of the therapy relies on few factors such as the acid concentration⁷⁻⁹, coats number applied, the time duration of coat. The two types of peels are medium depth peel and superficial peel. The therapeutic and cosmetic benefits are associated with the glycolic acid peel. It is the most commonly used peel agent as it penetrate the skin easily. These peels are commercially available in the markets. The antioxidant, anti-inflammatory effects are associated with the GA peels. The proper neutralization of the GA is required in order to prevent the skin acidification¹⁰.

MATERIAL AND METHODS

It is a randomized and controlled based study conducted at Dermatology Department of Liaquat University of Medical and Health Science, Jamshoro and Sir Syed Medical College and Hospital Karachi for the duration of six months from February 2022 to July 2022. This study was conducted at the dermatology department of our institute hospital. The ethical committee and review board of the hospital approved the study. The subjects, who participated in the study, signed the consent willingly.

The study included a total of 120 patients, 49 males and 71 females. These patients were divided into three groups. Patients in Group 1 have undergone the dermapen microneedling technique. The patients of Group 2 were treated with the glycolic acid peel. All patients were undergone through the dermatological examinations. The skin type, scar type and scar severity of every patient was assessed. After applying EMLA cream to the patients' faces for 40-60 minutes, gentle microneedling was performed. Microneedling sessions were performed every two weeks, for a total of six sessions for the patients. As history, demographic characteristics such as age, duration of treatment, and gender of the patients were taken into account. The majority of the study's participants were female.

RESULTS

The study comprised of a total of 120 patients, among them there are 49 males and 71 females, divided in three groups. Group 1

contains patients who experienced dermapen microneedling technique. Group 2 contains patients treated with glycolic acid peel 35% weight by volume solution was used, proper cleansing of the peel after applying is very crucial step, otherwise homogenous penetration and results will not be obtained. For washing water and cleansing soap is used. Group 3 contained patients given both dermapen and GA every 2 weeks in an alternating manner.

Table 1: Demographic features of the patients

Features	Group 1	Group 2	Group 3	P value
Average age (years)	31±6.1	27.3±7.8	26.1±7.1	0.005
Range (years)	28-41	18-28	21-33	
Duration of treatment in years	5.6±3.2	5.7±5.1	4.8±3.1	0.005
Sex of the patients				
Male	18	17	16	
Female	22	23	24	

The demographic features like age, duration of treatment, sex of the patients was taken as history. Table 1 shows basic features where the average age of patients was 31 in groups 1, 27 in group 2 and 26 in group 3. Majority of the study comprised female participants.

Table 2: Scar type among three groups

Type of scar	Outcome of the treatment	Group 1.	Group 2	Group 3
Icepick	Effective	17	7	16
	Not effective	7	15	12
Boxcar	Effective	14	14	12
	Not effective	12	17	5
Rolling	Effective	9	10	11
	Not effective	-	6	4

Table 2 shows the three kinds of scars that the patients had, including icepick, boxcar and rolling. The maximum efficacy was observed in case of group 3.

Table 3: Grading of the scar among groups

Grading	Group 1	Group 2	Group 3	P value
Mild	41%	55%	30%	
Moderate	39%	31%	40%	
Severe	20%	14%	30%	

The patient's response to the treatment given was also evaluated by using the standard global scar grading system. The three groups reported statistically significant results. Most of the patients reported about improvement in group 1 and 3, however in group 2, 31 patients showed no improvement as shown in table 4.

Table 4: Degree of improvement observed among participants

Variable	Group 1	Group 2	Group 3	P value
No improvement	15%	31%	-	0.00
Mild	42%	50%	31%	0.001
Good	43%	19%	50%	0.005
v.Good	-		19%	0.003

DISCUSSION

This comparative study was carried out to find the outcomes of two main acne treatments carried out by dermatologist. Acne scars are produced after a severe attack of acne. As per study one fifth of the patients suffering from acne report about scar leaving their skin bouncy and uneven¹¹. According to the literature scars are more common in male patients as compared to female patients¹². The severity of the acne has reduced after dermapen use in group 1 patients. In this study the patients that were in group 3 who received both microneedling and GA treatment showed better results than the other groups. A study was carried out to find the prevalence of acne scars among different populations and it was found that the Asian women (30%) face the acne scar issue more than Caucasian women (24%). People from all ethnicities and cultures were equally prone to acne scars in Asia¹³⁻¹⁴. In this study

the effectiveness of microneedling and GA treatment was compared among three groups. Group 1 has patients given microneedling treatment, group 2 has patients with GA treatment for acne scars and group 3 has patients who were given both treatments alternatively. It was found that microneedling was found to be more effective treatment as compared to GA as improvement was much more in case of microneedling. However, it was also observed that when given both treatments alternatively the improvement was much significantly reported. Our results are in accordance with the previous outcomes where microneedling was considered as a much better approach used for removal of acne scars also stating it as better option than the chemical peel. As per literature it was found that the darker skin tone patients are more prone to complications linked to chemical peels. The complications include dyspigmentation and scarring of the skin¹⁵⁻¹⁶. Microneedling is known to be effective as it limits any chances of infection and it keeps the epidermis intact so it is suitable for all skin tones. In our study the grading of scars was also carried out and it was found that group 3 had patients with most severe scars. In group 3 most of the patients showed mild improvement after treatment and there was no patient that reported no improvement. Other non-invasive treatments that include fractional laser can sometimes lead to hyperpigmentation as they are non-ablative and can activate melanocytes leading to severe skin conditions. Certain medical skin condition like erythema was observed as a side effect in some groups. But these side effects were gone soon after the sessions ended. This study not only clears that microneedling is better than chemical peeling by using GA, but it also reports that combined use of both treatments can prove to be more effective than the both treatments used separately. As per a study carried out on 41 patients, after 15 minutes of using GA 30% the 16 patients developed scarring and hyperpigmentation however the remaining patients showed good improvement¹⁷. Our results are in contradictory to a study that stated that GA 35% if used on patients can have more effective results than microneedling. The study analyzed that GA 35% gave positive results for boxcar type acne, but gave poor results for ice pick scar. In our study rolling scar showed the least positive results. As per literature, the use of dermaroller to treat acne scars is also one of the techniques preferred by dermatologists¹⁸. Only two sessions of dermaroller can help patient with their atrophic acne scars. Study was carried out to find the effectiveness and it was reported that out of 36 patients taken for study, 26 showed excellent results and confirmed improvement. Here in this case the least positive results were shown by ice pick scars¹⁹. Rolling scars showed maximum positive results by dermaroller as well. In order to get early and effective scar removal microneedling can be linked with other techniques such as chemical peel including GA and platelet rich plasma which has curative properties for scars²⁰⁻²¹. This study reports that use of microneedling together with GA treatment can help patient get rid of their acne scars. However, in this study a short follow-up session was also required so that any reoccurrence and complication can be included in the study.

CONCLUSION

For the management of acne scars there are numerous procedures used by dermatologists, the use of microneedling is much more effective than glycolic acid peeling, but if both techniques are used in an alternative manner, it not only gives positive results but also makes skin healthy smooth and shiny.

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