

Original Research Article

Microdermabrasion for treatment of acne scars in South Indian patients: a clinical study

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Received: 27 September 2016

Revised: 16 October 2016

Accepted: 19 October 2016

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ABSTRACT

Background: Acne is a common disorder with a more prevalence among adolescents and often it causes atrophic scars. Several treatment options are available for atrophic acne scars treatment. The objective of the study was to assess the efficiency and safety of microdermabrasion for acne scars in South Indian patients.

Methods: Forty patients (24 males and 16 females) with acne scars were enrolled in the study. Microdermabrasion was done to all patients and repeated at every two weeks intervals for a total of four sittings. Patients were followed up on tenth week. The response to the treatment was assessed by objective and subjective methods.

Results: All patients completed the study and follow up period. There were 8 patients with mild, 28 patients with moderate and 4 patients with severe grade of acne scars. At the end of the study, 9 patients (22%) with mild to moderate acne scars showed good response. 30% of patients were satisfied with the treatment with varying degrees. Side effects were transient and mild.

Conclusions: Microdermabrasion is a safe, easy to perform, well tolerated procedure for treatment of mild to moderate acne scars.

Keywords: Acne scars, South Indian patients, Microdermabrasion

INTRODUCTION

Acne is a common disorder with a high incidence among adolescents sometimes resulting in atrophic scars. The occurrence and incidence of scarring, still not fully understood, shows considerable variation, indicating that some people are more prone to scarring than others. Genetic factors may have an impact on the predisposition to scarring and the type of scarring.¹

Post acne scars are associated with considerable psychological distress, mainly in adolescents resulting in poor self-esteem, depression, anxiety, body image

alterations, embarrassment, anger, low academic performance and unemployment.² Different treatment options are available; the choice of treatment depends on the morphology and severity of each scar and expectations of the patient.³

Microdermabrasion is an office-based, superficial, minimally invasive technique of mechanical abrasion of the skin using a pressurized stream of particles such as aluminum oxide crystals.⁴ There is superficial wounding of the skin, followed by reepithelialization, stimulation and remodeling of dermal collagen thereby improving the appearance of acne scars. It perhaps performed on every

skin types including Fitzpatrick type IV-VI where the convenience of chemical peels, laser resurfacing, and dermabrasion is restricted.^{5,6}

This study attempts to find the therapeutic response of facial acne scars to microdermabrasion in South Indian patients.

METHODS

This open label therapeutic study was carried out in the Department of Dermatology, Dr B R Ambedkar Medical College in Bangalore during February 2015 to April 2015.

A total of 40 patients with acne scars were enrolled for the study. The inclusion criteria was emotionally

balanced patients with realistic expectation with facial acne scars. The exclusion criteria were patients with history of isotretinoin use in the past six months, herpes simplex infection, keloids, intake of any acne inducing drugs and systemic illness such as hypertension, diabetes and thyroid problems. Also, pregnant and lactating women were excluded.

All patients were evaluated by detailed history, general and dermatological examination to identify the presence of active acne lesions, site, type, area, colour and grades of acne scars based on Goodman and Baron’s grading system as given in Table 1.⁷ Patients were explained about the outcome, side effects and complications of the procedure. An informed written consent and photographs were taken prior to the procedure. Approval was obtained for the study from the local ethical committee.

Table 1: Goodman and Baron qualitative scar grading system.

Grade	Level of disease	Clinical features
1	Macule	Macular erythematous, hypo or hyperpigmented scars.
2	Mild	Mild atrophy that is visible at distances of less than 50cm and can be covered by make-up or beard hair. Examples include mild rolling acne scars.
3	Moderate	Moderate disease that is visible at 50cm or greater; not easily covered with make-up or the normal shadow of a shaved beard hair. Stretching the skin can flatten the scar. Examples include more significant rolling scars, shallow boxcar scars, and mild to moderate hypertrophic scars.
4	Severe	Severe disease as in grade 3 but scarring is not flattened by stretching the skin. Examples include severe boxcar, ice pick scars, and hypertrophic/keloid scarring.

The facial skin to be treated with microdermabrasion (Dermapeel Gold) was cleansed and degreased with acetone. Treatment parameters were set with pressure ~200 mm Hg. The facial skin was stretched with one hand and the hand piece moved gently in a linear sweeping motion in an outward direction, applying even pressure, leaving a uniform film of crystals. The entire face was covered in segment-wise manner, starting from right cheek, forehead, glabella, left cheek, chin, perioral area and nose. The session consisted of one to three passes for a period of 15-30 minutes. More pressure was applied till pinpoint bleeding was seen in case of deep acne scars. The dust was wiped off from the surface and cleaned thoroughly with water. After 10 minutes, a moisturizer cream was applied.

Treatment was repeated at every two week’s time for a total of four sittings. Photographs were taken before and after each treatment session. Any interference in daily activities and adverse effects post-treatment were noted. At the end of 10 weeks, improvements were graded based on clinical assessment and photographs.

Objectively, an improvement of scarring by two grades or more was labelled as ‘excellent’ response while a ‘good’ response meant an improvement by a single grade. In those patients where the scar grading remained the same after the completion of treatment was labelled as ‘poor’.

The patients were given a pre-formed questionnaire at the end of the study, wherein subjective assessment was obtained on a 10-point scale. Questions were asked on depth of scars, side effects, occurrence of new acne lesions, improvement in skin texture and complexion and each were given 2 points. Rating below 4 was graded as ‘poor response’, rating between 4 and 6 served as ‘good response’ and rating above 6 meant an ‘excellent response’.

RESULTS

Out of 40 patients, there were 24 males and 16 females with mean age of 22.63±3.32 years as shown in Table 2.

Table 2: Age distribution.

Age in years	No. of patients	%
<20	7	17.5
20-30	33	82.5
Total	40	100.0

Mean ± SD: 22.63±3.32

According to Fitzpatrick skin type, 20 patients had type IV, 16 had type V and 4 had type VI. Average duration of acne scars was 2.95±1.71 in years. Family history was positive in 50% of patients. 14 patients had rolling scars, 5 patients had boxcar scars and 21 had mixed scars.

Cheeks were involved in all 40 patients, forehead in 10 patients, chin in 3 patients and nose in 2 patients. According to the severity of scarring based on Goodman and Baron grading system, there were 4 patients with grade 4, 28 patients with grade 3 and 8 patients with grade 2 scars.

The statistical software namely SPSS 20.0 was used for the descriptive and inferential analysis of the data in the present study. Good response was noted in 5 of the 28

patients with grade 3 scarring, and poor response in 23 patients. 4 of 8 patients of grade 2 showed good response while 4 showed poor response. Patients with grade 4 showed no response with the treatment. Overall, 9 patients showed good response and remaining 31 patients failed to show any significant response as shown in Table 3. The difference in the grades was statistically significant (p value =0.000) using Chi-square test. As shown in Table 4, grade 2 and grade 3 acne scars are improved by some grades.

Table 3: Overall response.

Grade of scarring response	Type of scarring			Total
	Mild (8 patients)	Moderate (28 Patients)	Severe (4 pateints)	
Excellent	0	0	0	0
Good	4 (50%)	5 (17.8%)	0	9 (22%)
Poor	4 (50%)	23 (82.2%)	4 (100%)	31 (78%)

P value statistically highly significant (p value = 0.000).

Table 4: Grades after the treatment.

	Grade before treatment	Objective response after treatment				Total
		1	2	3	4	
	2	4 (50%)	4 (50%)	0	0	8 (20%)
	3	0	5 (17.8%)	23 (82.2%)	0	28 (70%)
	4	0	0	0	4 (100%)	4 (10%)
Total		4 (10%)	9 (22.5%)	23 (57.5%)	4 (10%)	40 (100%)

Subjective evaluation was done at end of the study. According to the Table 5, 2 patients had excellent response while 10 patients had good response. About 7 patients had good response both objectively and subjectively are shown in the Table 6. Side effects were seen in the form of erythema only in 5 patients. There was no post inflammatory hyperpigmentation.

Table 5: Subjective evaluation.

Response	No. of patients	Percentage
E	2	5.0
G	10	25.0
P	28	70.0

P value statistically highly significant (p value = 0.000).

Table 6: Correlation between the objective and subjective response.

Objective response		Subjective response			Total
		E	G	P	
Objective response	G	2 (22.2%)	7 (77.7%)	0	9 (22.5%)
	P	0	3 (9.6%)	28 (90.4%)	31 (77.5%)
Total		2 (5%)	10 (25%)	28 (70%)	40 (100%)

DISCUSSION

In our study, 16 patients were females and 24 patients were males with the average age of 22.63±3.32 years. In a survey done for acne scars, there was no gender difference but in our study males predominated, probably due to increased severity of acne in males. Most patients had mixed type of acne scars compared to the study by Layton et al which showed more of ice pick scars.^{8,9}

In the study, improvement of scarring was assessed objectively along with photographs when compared to the studies done by Shim et al and Tsai et al where no grading was done.^{5,10}

Microdermabrasion showed good response in 9 patients with mild to moderate acne scars while remaining 31 patients failed to show any significant response. In the study, overall 22% of patients showed improvement in

their scars by some grades which were similar to the study by Bhalla et al which showed an improvement of 5 to 20%.¹¹ This shows that microdermabrasion gives some improvement in mild acne scars when compared to the severe acne scars. The limitation of the study is the number of sittings employed; only 4 sittings are not sufficient to suggest the benefit.

Following each session, there was an immediate feel good effect with microdermabrasion due to dermal oedema (plumping effect) which was appreciated by all the patients as improvement due to visual impact. This effect is not been noted by any of the studies.

About 30% of patients with mild to moderate acne scars were satisfied with microdermabrasion in varying degrees. The procedure was well tolerated by all patients. Post-procedure there was no loss of work days and side effects were mild and transient similar to the studies done by Bhalla et al.¹¹

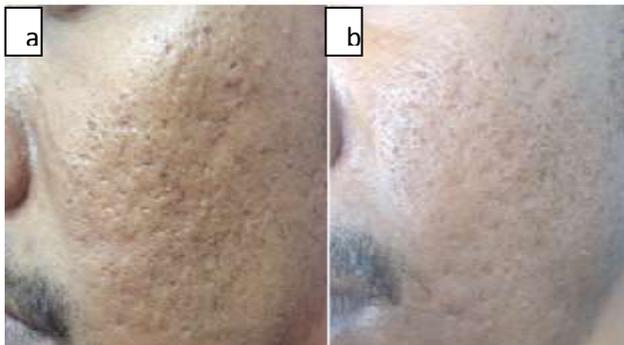


Figure 1: (a) Grade 3 acne scars before treatment (b) improvement in acne scars from Grade 3 to Grade 2 after treatment with microdermabrasion.



Figure 2: (a) Grade 2 acne scars before treatment (b) Improvement in acne scars from Grade 3 to Grade 2 after treatment with microdermabrasion.

CONCLUSION

Microdermabrasion is a simple, safe, well tolerated office procedure mainly used for mild acne scars. Side effects are minimal while major drawback is insignificant efficacy. It can be considered as a treatment option for mild acne scars for its feel good effect in circumstances where advanced treatment options are unavailable.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Anupama YG, Wahab AJ. Microdermabrasion for treatment of acne scars in South Indian patients: a clinical study. *Int J Res Dermatol* 2016;2:109-12.