



**COST EFFECTIVE APPROACH TOWARDS ACNE SCARS: USE OF DERMAROLLER
IN ACNE SCARS MANAGEMENT IN PATIENTS WITH FITZPATRICK SKIN TYPE 5**

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ABSTRACT

Scarring is a common consequence of acne particularly if treatment is delayed. It causes physical disfigurement and has a psychological impact on a person's life. The treatment is a challenging part where methods like microneedling, chemical peels, subcision, phototherapy, lasers and fillers have been tried. Microneedling is a simple, economical and effective method. Needles of dermaroller cause a uniform depth of injury of dermis and break collagen layer of the superficial dermis. This dermal injury induces wound healing by stimulating new collagen and elastin synthesis.

KEYWORDS: acne scars, dermaroller, Fitzpatrick's skin type 5.

INTRODUCTION

Acne vulgaris is a common inflammatory disorder of pilosebaceous unit affecting more than 85 % adolescents and two third of adults.^[1] Its characterized by seborrhea, comedones, papules, pustules, nodules, cysts and scars. Acne scars are permanent disfiguring sequel which can take different morphological forms. Most of the studies have shown acne scars as to be more in males than females. Scarring is a major concern as scars can persist for longer duration^[2] and are associated with adverse psychosocial disability, depression, anxiety and stress.^[3] Although scars are difficult to treat, many treatment options are available for scars which include microneedling, lasers, chemical peels, dermal fillers, dermabrasion. Scar treatment in Fitzpatrick's skin type IV to VI is more challenging due to increased risk for scarring and post inflammatory hyperpigmentation.^[4] Outcomes of treatment also depend upon the skill of the person doing it and may result in increased scarring if done incorrectly. Procedures like laser resurfacing or medium depth chemical peel are not good options for skin type 5 people due to risk of PIH, infection, scarring and prolonged healing time.^[5] As the procedures are costly and require multiple settings, there is a need to explore the options which are effective, within the reach of the vast Indian middle class and yet safe for Indian skin types. Microneedling with dermaroller is a simple and economical procedure and hence we did this study to evaluate the results in skin type 5.

Microneedling also called percutaneous collagen induction or collagen induction therapy is a minimally invasive procedure for acne scars. It was described by Fernandes as an alternative to laser rejuvenation.^[6]

Dermaroller is a drum shaped device with fine protruding needles which pierce stratum corneum without damaging the epidermis to release growth factors and stimulate new collagen formation.

MATERIALS AND METHODS

This is a prospective interventional study conducted during January 2022 to march 2022. 30 patients with any grade of atrophic post acne facial scarring were included in the study. Inclusion criteria were age group 20-25 years, Fitzpatrick's skin type 5, absence of active lesions and voluntary participation. Exclusion criteria was active lesions of acne, patients with keloidal tendency, active bacterial/ viral/ fungal infections on face, pregnant / lactating women, bleeding diathesis and patients on anti coagulants. While enrolling, patients' demographic details and short history was noted and physical examination was done. Photographs were taken at the baseline and every follow up. Acne scar assessment score was recorded for each patient based on number, severity and type of scar. [table 1].^[7] Scars were further graded as mild^[1-6], moderate^[7-12], severe^[13-18] based on total score.

A written informed consent was taken from all the patients. The face of the patient was cleaned with alcohol & betadine then a topical anesthetic under occlusion was applied and left for 50-60 mins. Then it was cleaned and microneedling was done over scars with dermaroller. Drum-shaped roller studded with 192 fine microneedles (1.5 mm in length and 0.1 mm in diameter) arranged in eight rows was used. Scar area was selected and rolling was done 16-20 times in different directions till uniform pinpoint bleeding. Treated area appeared edematous with oozing of serum. Patients were advised sun protection

and were instructed to avoid other topical applications and make-up for 3 days post procedure.

Total three sessions of micro needling were done with interval of 4 weeks. At every visit photographs were taken and score was assessed with the help of acne scar assessment scoring^[15] and investigators assessment of improvement based on quartile score (1: <25%, 2:25-50%, 3: 50-75%, 4:>75%). Final assessment was done 1 month after the last session. Improvement was also assessed by patients by 10 point VAS score. The rating above 6 points on this scale was graded as “excellent response”, between 4 and 6 points as “good response” and below 4 points as “poor response”^[16]



Figure 1: Dermaroller.

Statistical analysis

Data was coded using SPSS version 17. To summarize data, percentage was used for qualitative variables and mean standard deviation for quantitative variables. After finding mean acne scores for patients at the 1st visit and at the end of the treatment. Statistical significance of the difference in acne scar scores was estimated using paired t-test at 5% significance level. Clinical improvement was analyzed by initial severity status. $P \leq .05$ was considered statistically significant.

RESULTS

The study was conducted on 30 patients including 21 males and 9 females. Age of the patients ranged from 20 to 25 years and all were of the skin type 5. All the patients completed the study and their acne scar assessment score was calculated at the first visit. The patients in our study were having all types of scars – ice pick, rolling, boxcar. Severe grade acne were seen in 11 males and 3 females while moderate grade acne were seen in 10 males and 6 females. The mean acne scar assessment score of all 30 patients was 10.73. Final assessment was done after 4 months, i.e one month after the last session. The score decreased to 6.43, The figure1 shows comparison between baseline score and post treatment score of scar among males and females.

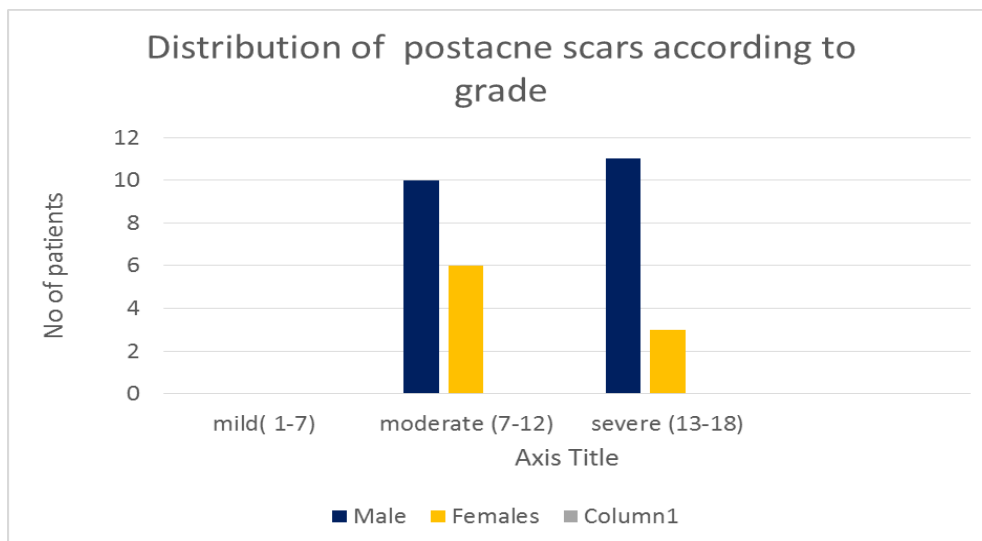


Figure 2.

Table no.1: Sex-wise distribution of severity of acne.

Grading of acne	Mild	Moderate	Severe
No of male patients	0	10	11
No of female patients	0	6	3

Mean acne scar score difference between baseline and end of the study in males and females was 4.66 and 4.3 respectively. The difference between them was not statistically significant. The difference of acne scar assessment score between baseline and end of the therapy in patients with moderate and severe grade acne scars was.

According to quartile score, investigators assessment was done and 6 patients showed >75% improvement, 18 patients showed 50-75% improvement, 6 showed <25%. [Figure 9]. According to VAS score assessed by patients, 5 reported excellent response, 18 good response and 7 reported poor response. [Figure 8]

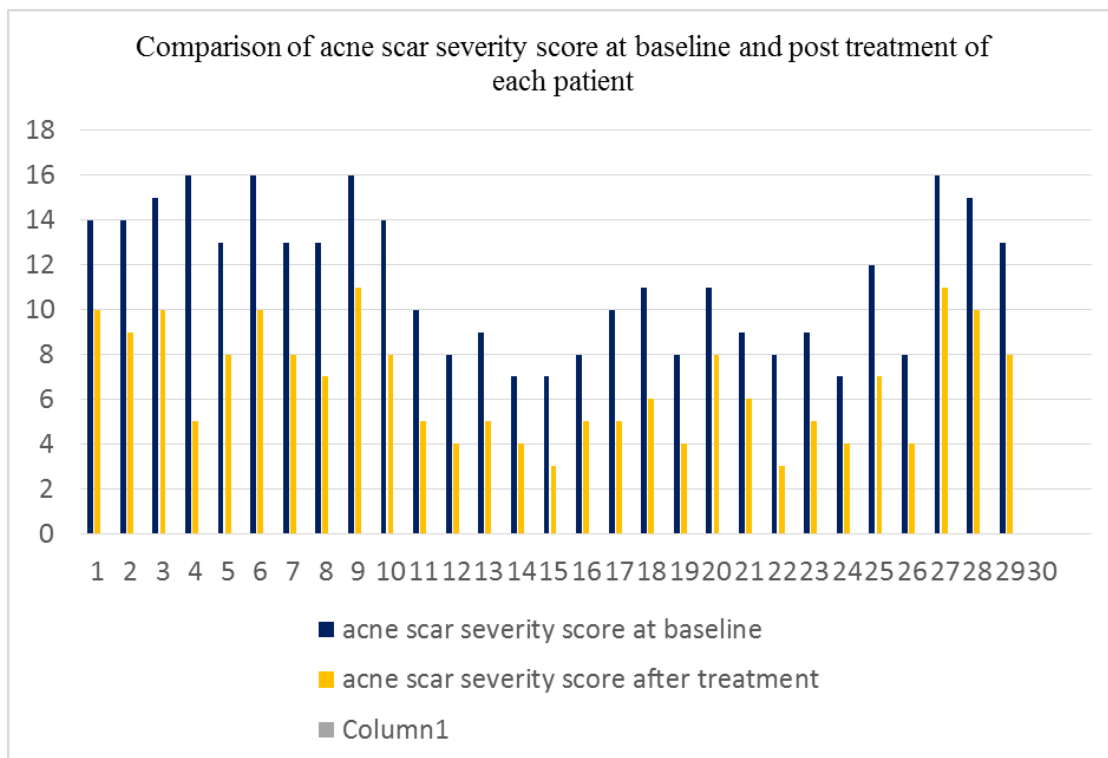
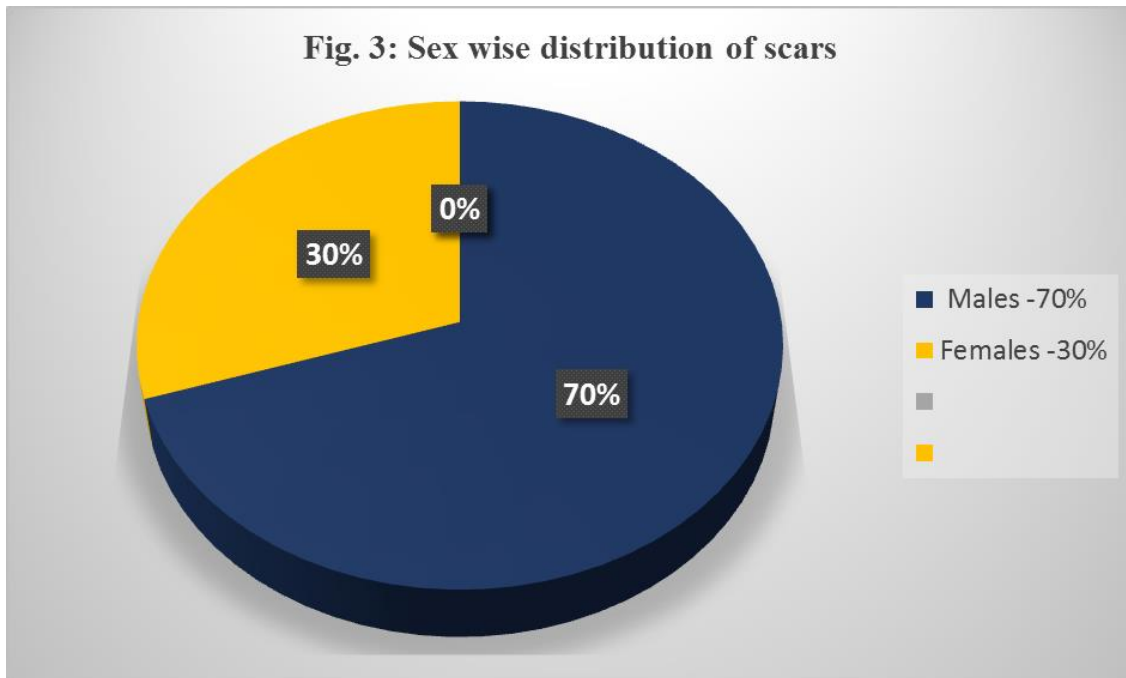


Table 2: Comparison of acne scar severity score at baseline and post treatment of each patient.

	Acne scar assessment score at baseline	Acne scar assessment score at the end of treatment
1	14	10
2	14	9
3	15	10
4	16	5
5	13	8
6	16	10
7	13	8
8	13	7
9	16	11
10	14	8
11	10	5
12	8	4
13	9	5
14	7	4
15	7	3

Table 2: (continued): Comparison of acne scar severity score at baseline and post treatment of each patient.

	Acne scar assessment score at baseline	Acne scar assessment score at the end of treatment
16	8	5
17	10	5
18	11	6
19	8	4
20	11	8
21	15	6
22	8	3
23	9	5
24	7	4
25	12	7
26	8	4
27	16	11
28	15	10
29	13	8
30	11	6

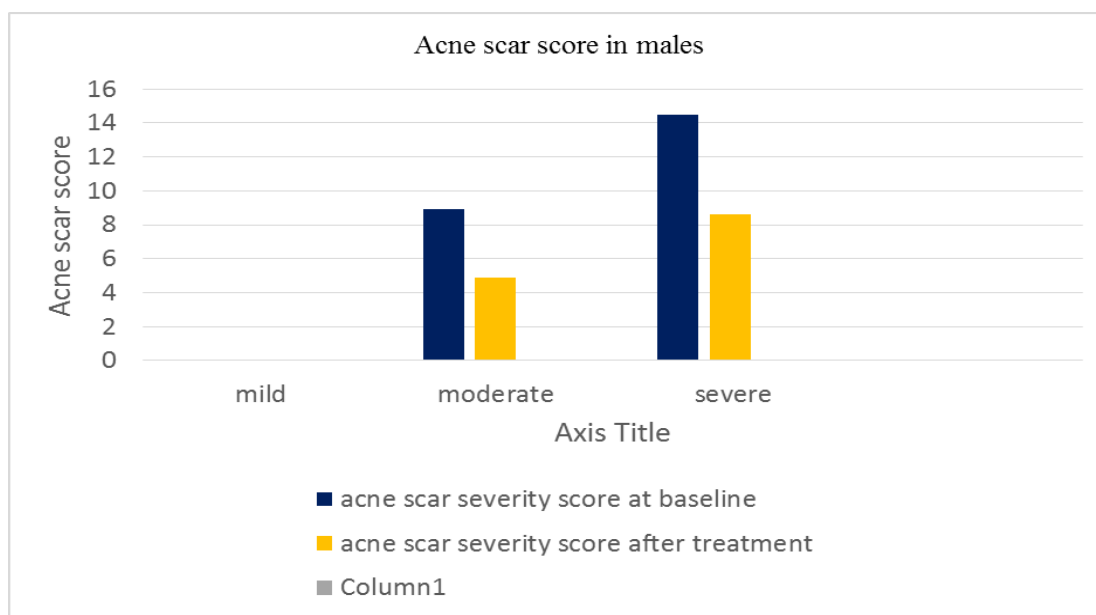


Figure 5.

Table no.3: Acne scar score at baseline and after treatment in males.

	Acne scar assessment score at baseline	Acne scar assessment score at the end of treatment
Mild	0	0
Moderate	8.9	4.9
Severe	14.45	8.63

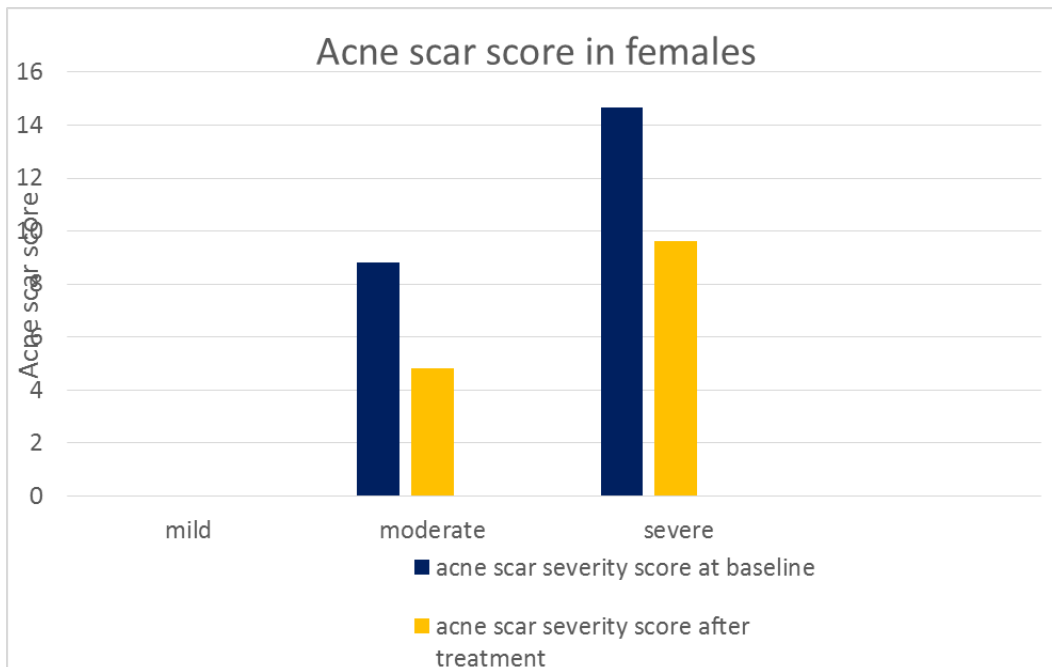


Figure 6.

Table 4: acne scar assessment score.^[16]

Characteristics	Lesions 1-10	10-20 lesions	>20 lesions
Macular erythematous or pigmented Mildly atrophic Dish-like	1	2	3
Moderately atrophic dish-like Punched out with shallow bases, small scars (<5 mm)	2	4	6
Punched out with deep but normal bases, small scars (<5 mm) Punched out with deep abnormal bases, small scars (<5 mm) Linear or troughed dermal scarring Deep, broad atrophic areas	3	6	9

Side effects reported were very less and mild in nature. Amongst erythema, edema, scar, PIH, most common was pain during the procedure. This was complained by 25 patients out of 30. Erythema post procedure [figure 7] was seen in almost all the patients. All the patients had topical anesthesia applied prior to the procedure. Other side effects seen were facial edema and erythema which lasted for a couple of hours. Hyperpigmentation was reported only in 3 patients. This resolved within few weeks after strict photo protection. No severe scarring was seen in any patient.



Figure 7.

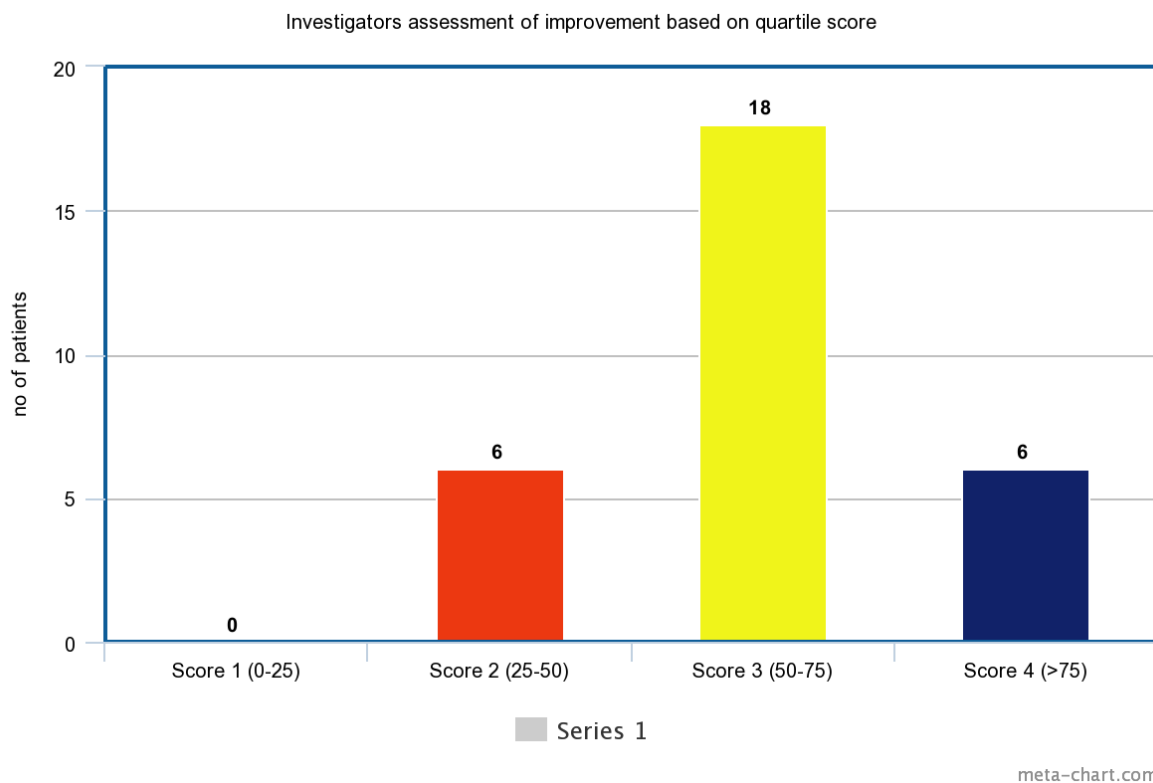
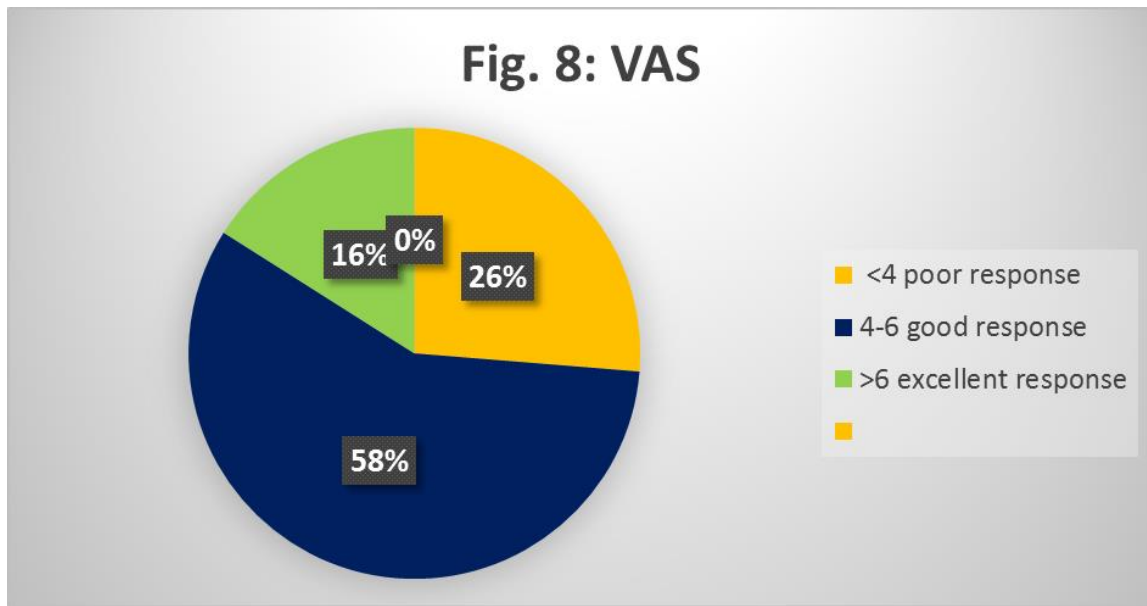


Figure 9.

DISCUSSION

Acne scar management includes various modalities ranging from chemical peels, subcision, lasers, micro needling, dermabrasion. Acne scar has great impact on quality of life and is associated with embarrassment, self-consciousness and lack of self-confidence.^[7,8] Hence treating scars is an important part of treating acne. Microneedling has been used in androgenic alopecia^[9], skin rejuvenation, atrophic scarring^[10,11] and to enhance drug penetration. It creates small wounds due to puncturing of epidermis and dermis which result in cascade of growth factors leading to tissue proliferation,

regeneration and collagen remodeling.^[12] This whole process of damage, inflammation and tissue remodeling due to damaged superficial dermis and ruptured capillaries is called percutaneous induction.^[13,14] A drum shaped dermaroller is used with 192 fine micro needles of 1.5mm long, in 8 rows which creates uniform micro bleeding. The process is repeated every 4 weeks.

Here we performed micro needling on 30 patients having skin type 5 with acne scars and efficacy and complications were evaluated. 21 male and 9 female patients were enrolled. Scarring in dark skin types is

challenging as there are more chances of post inflammatory hyperpigmentation. Patients with all grades of severity and types of atrophic scars were included in the study and showed improvement. All the patients were compliant and followed up every 4 weeks for 3 sessions and it was possible to evaluate the results. In different studies total number of treatment sessions varied from 2-6 but its not yet established whether more number of sessions result in higher efficacy.

In a similar study by Fabbrocini et al. done on 32 patients showed significant improvement in scar depth and no complications were observed.^[17] Another recent study by Fabbrocini was done by dividing patients according to skin types and showed good improvement.

Micro needling is a simple and safe procedure but a few side effects could be seen like erythema, edema, itching, skin tightness, mild pain. In our study 50% patients complained of pain during the procedure. Post procedure erythema and edema was also seen in almost all patients which subsided in 2-3 days. There were no PIH related and photosensitivity related complications as the patients selected were educated and followed the instructions. All were advised photoprotection using broad spectrum sunscreen and physical methods. The risk for PIH is associated with the degree of inflammation and it was not seen in our study.

Advantages of the procedure are that its well tolerated, cost effective and can be done on areas not suitable for other procedures while the disadvantages are limited and include non suitability in patients with active acne, warts, herpes, eczema.

To conclude, our study gave satisfactory results and was associated with minimal adverse effects. The adverse effects subsided within a few days and hyperpigmentation that was seen in 10% patients resolved within few weeks after proper photoprotection. Hence the procedure is safe in Fitzpatrick skin type 5. According to the acne scar assessment score, Thus micro needling using dermaroller is cost effective safe and efficacious procedure for acne scar management in skin type 5.

Not many studies have been performed to manage scars in skin type 5. This study was done particularly for skin type 5 and as majority of the patients we have in our country have darker skin type, it will guide us to use better options. Acne scars leave much psychological impact so correcting scar without leaving hyperpigmentation.

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According to the acne scar assessment score, Thus micro needling using dermaroller is cost effective safe and efficacious procedure for acne scar management in skin type 5.

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