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A comparative study on efficacy of micro needling with Subcision versus micro needling alone for management of atrophic acne scars.

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Abstract

Background: Acne vulgaris is a chronic skin disease caused by blockage and/ or inflammation of pilosebace ous units in which lesions present as non-inflammatory, inflammatory or mixture of both. The inflammatory type, often results in distressing scars such as keloid, hyper trophic and atrophic scars. Acne scar is permanently disfiguring, both physically and mentally affecting an individual's quality of life. Atrophic acne scarring is by far the most common form. There are variety of treat Ment modalities available for its management such as resurfacing procedures, lifting procedures and surgical procedures. We have done this study to evaluate the effect of two modalities on atrophic acne scars.

Aim: To assess the efficacy and safety of combination of micro needling with sub cision versus micro needling alone in treatment of atrophic acne scars.

Materials and methods: This is a hospital based long itudinal comparative study carried out at dermatology outpatient department in which 60 patients (38 females and 22 males) of atrophic acne scars were enrolled and subdivided into two groups of 30 patients each. One group was treated with Subcision and micro needling alternatively at 4-week interval while other group was treated with micro needling alone at interval of 4 weeks. Outcome assessment was done one month after last sitting using Goodman and Baron qualitative scar grading system.

Result: In micro needling with Subcision group, excellent response was seen in 57.14% and good response in 42.86% and in only micro needling group, excellent response was seen in 42.31% and good response in 57.69%.

Conclusion: Both treatment modalities were efficacious in management of atrophic acne scar while micro needling with Subcision was found to be superior than micro needling alone.

Keywords: Atrophic acne scars, micro needling, Subcisi on.

Introduction

Acne, the most common skin ailment, is a disorder of the pilosebaceous units that peaks between the ages of 14 and the beginning of the third decade, but can persist or reoccur in adulthood (20% of men and 35% of women), affecting almost all ethnicities and races.[1] The clinical lesions are non-inflammatory open and closed come dones and/ or papules, pustules, and nodules with varying degrees of inflammation and depth.[2]

Inflammation is thought to be a key factor in the patho genesis of acne.[3] The end result of inflammation is healing with cutaneous scar formation. The severity of the scar is determined by the depth and degree of inflammation. The scar may appear as an erythematous or hyper chromic macule if only the epidermis and superficial dermis are involved. If the deep dermis is affected, sharp-walled or ice pick scars form. When more extensive deep dermal damage occurs, broad scars such as rolling scars or boxcar scars can form. Scars are classified into three types: Atrophic, Hypertrophic, and Keloidal. Atrophic acne scars occur more frequently than hyper trophic scars.

In this cosmetically competitive society, physical blemishes caused by scars cause adverse psychosocial issues such as awkwardness, frustration, low self-esteem, avoidance of inter personal interaction, decreased academic performance, altered perception of body image, and depression. [4,5]

Scars can only be modified, and no treatment guarantees complete disappearance.[6] There are variety of treatment modalities available for management of atrophic acne scars such as resurfacing procedures (e.g., Chemical peels, micro needling and lasers), lifting procedures (e.g., Subcision, punch techniques and fillers) and surgical procedures (e.g., Z plasty, W plasty, V-Y and Y-W advancement).

In this study we have used micro needling and Subcision for the treatment of atrophic acne scar because micro needling requires very short healing phase and it is a low-cost alternative for laser therapy and Subcision focuses on individual scars so scars can be treated as a whole.

Materials and methods

Study design

This is a hospital based longitudinal comparative study carried out at dermatology outpatient department from June 2021 to July 2022.

Sampling technique

convenience purposive sampling

Inclusion criteria

All the patients belonged to the age group of 18-40 years and having grade 2 to grade 4 atrophic acne scars.

Exclusion criteria

Patients not willing to give consent, having grade 1 acne scar, pregnancy, lactation, unrealistic expectations, keloidal tendency, bleeding disorders, active skin infection/ acne, taking oral isotretinoin and those who has taken laser or any other scar treatment in last 6 months.

Methods

Total 60 patients who fulfilled the inclusion and exclusion criteria were included after taking informed written consent. Each patient was asked about detailed relevant clinical history regarding the onset, duration, symptoms, severity of the lesions and history of any medication. Necessary investigations like CBC, RBS, BT, CT, PT and aPTT were done. All the cases were

numbered serially and photographed whenever necessary after taking informed valid consent.

60 enrolled patients were subdivided into two group of 30 patients each. One group underwent one sitting of Subcision, followed by one sitting of micro needling after 4 weeks, to follow the same sequence making total of three sittings of each modality over period of 6 months, while other group underwent total of six micro needling sittings with a gap of 4 weeks each. Evaluation was done before starting the treatment and 1 month after the last sitting using Goodman Barron Qualitative analysis: Excellent response – 2 grade reduction, Good response – 1 grade reduction and Poor response – no grade reduction and Goodman Barron Quantitative score: if reduction in number of scars 0-5 = minimal response, 5-10 = moderate response, 10-15 = good response and 15-20 = very good response.

Both groups were treated after achieving topical anaesthesia with proper aseptic precautions.

Subcision

It was performed using an 18-gauge, hypo dermic needle which was moved from side to side under the scar 2-3 times. Topical and oral antibiotics were given for 7 days with photoprotection.

Micro needling

Acne scars were treated with a professional device having a rolling barrel with 192 needles in 8 rows and needle length of 1.5 mm with a diameter of 0.25 mm, was rolled with some pressure, 4 times in 4 directions: horizontally, vertically, and diagonally right and left. The patient was advised not to wash their face for 4-6 hours and topical antibiotics and oral anti-inflammatory drugs were prescribed for 5 days along with photo protection.

Statistical method

Data were analysed using MS Excel and SSPS (Statistical Package for the Social Sciences) software. Quantitative variables were expressed in mean and standard deviations. Paired t-test and unpaired t-test was used for comparison between two groups. For all statistical analysis, $P<0.05$ was considered statistically significant.

Results

Majority of the patients belonged to 18–24 years age group (n = 33, 61.11%) followed by 25–30 years age group (n = 14, 25.92%) with mean age of 26.2 years. Out of 60 patients, 54 who had completed study, 24 were male and 30 were female patients. Most patients had mixed atrophic acne scars of ice pick, boxcar and rolling type. Pre-treatment acne scar grading and score of patients are given in table.1 and table.2 respectively.

At the end of study period on Qualitative scar assessment in micro needling with Subcision group; among 16 patients of Grade 4 scars, 68.75% patients (11) showed improvement by 2 grades and 31.25% patients (5) showed improvement by 1 grade. Among 9 patients with Grade 3 scars, 55.56% patients (5) improved by 2 grades and 44.44% patients (4) showed improvement by 1 grade and in Grade 2 scars and 100% (3) patients improved by 1 grade.

In micro needling with Subcision group, quantitative improvement is as mentioned in table 4.

On Qualitative scar assessment in micro needling group; among 10 patients with Grade 4 scars, 80% patients (8) showed improvement by 2 grades and 20% patients (2) showed improvement by 1 grade.

In 14 patients with Grade 3 scars, 21.43% patients (3) improved by 2 grades and 78.57% patients (11) showed improvement by 1 grade and in Grade 2 scars and100% patients (2) improve Ment by 1 grade. In micro needling group, quantitative improvement is as mentioned in table 4.

Statistical analysis using paired and unpaired t-test is given in table 5 and 6 respectively.

All patients experienced pain during procedure and transient erythema was also seen which disappeared with in 24 hrs.

Three patients in micro needling group and two patients in micro needling with Subcision group developed post inflammatory hyperpigmentation. Two patients in micro needling with Subcision group had hematoma formation which improved over a period of 15 days spontaneously.

Table 1: pretreatment grades of acne scars (n=54)

Modality	Grade-2	Grade-3	Grade-4	Total
Micro needling with Subcision	3	9	16	28
Micro needling	2	14	10	26
Total	5	23	26	54

Loss to follow up: In micro needling with Subcision group = 2 patient and in micro needling only group = 4 patient

Table 2: pretreatment quantitative score of acne scars (n=54)

Modality	(15-29) score	(30-44) score	(45-60) score	Total no of patients
Micro needling with Subcision	8	9	11	28
Micro needling	10	10	6	26

Table 3: post treatment assessment using goodman baron qualitative score

Modality	Poor response	Good response	Excellent response	Total no. Ofpatients
Micro needling with Subcision	0	12(42.86%)	16(57.14%)	28(100%)
Micro needling	0	15(57.87%)	11(42.31%)	26(100%)

Table 4: post treatment assessment using goodman baron quantitative score

Modality	Minimal	Moderate	Good	Very good	Total no. Of patients
Micro needling with Subcision	2(7.14%)	8(28.57%)	13(46.43%)	5(17.86%)	28(100%)
Micro needling	7(26.92%)	9(34.62%)	7(26.92%)	3(11.53%)	26(100%)

Table 5: statistical analysis of effect of different moda lities in atrophic acne scars

Treatment modality	Goodman baron quantitative score		p-value
	Pre-treatment Mean ± SD	Post-treatment Mean ± SD	
Micro needling with Subcision	37.43±10.68	25.54±6.60	0.00001
Micro needling	37.77±10.74	29.62±7.08	0.002

Table 6: comparison of derma roller with Subcision and derma roller alone in atrophic acne scar

Goodman baron quantitative score	Treatment modality		p-value
	Micro needling with Subcision	Micro needling	
Pre-treatment Mean ± SD	37.43±10.68	37.77±10.74	0.91
Post-treatment Mean ± SD	25.54±6.60	29.62±7.08	0.03

Discussion

Acne scars are polymorphic and different type of scars can occur in the same patient. The morphology of scars must be assessed and treatment should be planned based on the types of scars, overall appearance, and expectations of the patient. All these factors make the assessment of efficacy of any therapeutic option difficult to judge across all the patients. [7,8]

In our study out of 60 patients, 18 were male and 42 were female, which suggests that females are more concerned about facial aesthetics than males.

In a study by Jawade et al. [9], among 28 patients, 10 were male patients and 18 were female patients.

In a study by S. Dogra [10] et al., among 36 patients, 10 were male patients and 26 were female patients which is comparable to our study.

In our study, 33 patients were in the 18-24 years age group and 14 patients were in the 25-30 years age group. This is because acne vulgaris is the most common skin disease of adolescents and young adults with reported prevalence being nearly 80%.[11]

In a study by Pooja et al. [12] patients in the 16-45 years age group were selected and among them, 18-24 years were the most common age group.

The mean age at presentation in our study was 26.2 years. In study by S. Dogra et al. [10] in which the mean age was 25.47 years and in a study by Hassan et al [13], the mean age of the patients was 26.07 years.

In this study all the patients had mixed type of scarring-combination of rolling, boxcar, linear, and ice pick scars. In study by S. Dogra et al. [10], all patients had mixed types of scars which included rolling, shallow to deep box-car and icepick scarring.

According to Khalid FA et al. [14], All patients with Grade 2 scar showed 1 grade reduction and out of 20 patients with Grade 3 scars, 30% (06) showed 1 grade improvement and the remaining 70% (14) improved by 2 grades after treatment. This study treatment was performed with micro needling every 3rd week for four sittings.

According to Pooja et al. [12], out of 17 patients of the micro needling group 7 patients had grade 2 scars, 11 patients had grade 3 scars and 2 patients had grade 4 scar and at the end of four sessions of treatment 7 patients showed 1 grade improvement and 10 patients showed improvement by 2 grades.

On applying Paired t-test (p value <0.05) both modalities are effective in the management of atrophic acne scars.

On applying Unpaired t-test (p value 0.03) micro needling with Subcision is more effective in the treatment of atrophic acne scar as compared to micro needling alone.

All patients experienced treatment-related pain and transient erythema. Three patients in micro needling group and two patients in micro needling with Subcision group reported post inflammatory hyperpigmentation. Two patients in micro needling with Subcision group had hematoma formation.

In a study by Pooja et al. [12], out of 17 patients treated with derma roller post procedural pain was seen in 10 patients and erythema and edema was seen in 5 patients.

In a study by S. Dogra et al. [10], out of 36 patients treated with micro needling 13 patients had pain and 5 patients had hyperpigmentation.

Figure 1: Pre-treatment micro needling with subcision

Figure 2: Post treatment excellent response

Figure 3: Pre-treatment micro needling alone

Figure 4: Post treatment excellent response

Conclusion

Both treatment modalities are well tolerated and efficacious but micro needling with subcision is superior but having more side effect than micro needling alone.

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