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ORIGINAL RESEARCH

A comparative analysis of Derma roller therapy and fractional carbon dioxide laser technique in patients with post-acne scars

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ABSTRACT

Background: Acne vulgaris is a common skin disorder that mainly affects the face but can also affect the back and chest. It can cause inflammatory and non-inflammatory lesions as well as varying degrees of scarring. The present study compared fractional carbon dioxide laser technique and derma roller therapy in patients with post-acne scars.**Materials & Methods:**Two groups of 35 patients each were created from 70 individuals with post-acne scars of both sexes. Patients in Group I received derma roller therapy, while the other group had fractional CO2 laser treatment every four weeks for a total of twenty-four weeks. The global acne scarring categorization was used for a baseline assessment of each patient, which was both objective and subjective.**Results:** Response was satisfactory seen in 6 in group I and 3 in group II, good in 7 and 11 in group I, very good in 16 in group I and 14 in group II and excellent in 6 in group I and 7 in group II. The difference was significant (P< 0.05). The mean objective score at baseline in group I was 30.2 and at follow up was 16.4 and in group II at baseline was 29.7 and at follow up was 16.1. The difference was significant (P< 0.05).**Conclusion:** It was demonstrated that both methods were equally effective in treating scars from acne.

Key words: Acne, CO2 laser, derma roller

INTRODUCTION

Acne vulgaris is a common skin disorder that mainly affects the face but can also affect the back and chest. It can cause inflammatory and non-inflammatory lesions as well as varying degrees of scarring. Prolonged scarring and psychological conditions like anxiety, sadness, and low self-esteem are associated with significant morbidity from acne.[1] The quality of life is negatively impacted by these conditions. Damage to the skin triggers a chain of events that ultimately heal the wound, resulting in acne scars. The wound healing process consists of three stages: inflammation, granulation tissue formation, and matrix remodeling.[2]

Post-acne scarring is one of the most common causes of facial deformity. Studies show that 50% of people with acne have scarring that is clinically substantial, and nearly 80% of individuals havesome scarring.[3]

Acne scarring is common in adolescents and young adults and can lead to serious psychological problems. These patients report a much lower dermatological life quality index (DLQI) than those without scars.3. Chemical peels, microdermabrasion, fractional photothermolysis (FP), ablative and non-ablative lasers, radiofrequency (RF), punch excision, pin point irradiation, punch elevation, punch replacement grafting, tissue augmenting agents, microneedling, subcision, combined therapy, stem cell therapy, and IPL are just a few of the frequently used techniques. The improvement in acne scar appearance following fractional CO2 laser treatment is due to a combination of healing processes that initiate new collagen deposition following ablation and collagen remodeling initiated by the zone of coagulation surrounding the ablated area.[4]CO2 lasers produce a noticeable improvement, albeit at the price of long recovery times and post-inflammatory hyperpigmentation. Fractional radiofrequency (MFR) microneedling is a novel method of scar treatment that does not damage the epidermis.[5]The present study

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compared fractional carbon dioxide laser technique and derma roller therapy in patients with post-acne scars.

MATERIALS & METHODS

This study comprised of 70 patients with post-acne scars of both genders. They received written consent after being briefed about the study.

Name, age, gender, and other details were noted. Two groups of 35 patients each were created from the patients. Patients in Group I received derma roller therapy, while the other group had fractional CO2 laser treatment every four weeks for a total of twenty-four weeks. The global acne scarring categorization was used for a baseline assessment of each patient, which was both objective and subjective. Date was recorded and compared. P value less than 0.05 was considered significant.

RESULTS

Table I Objective evaluation of patients in both groups

Response	Group I (35)	Group II (35)	P value
Satisfactory	6	3	0.05
Good	7	11	
Very good	16	14	
Excellent	6	7	

Table I, graph Ishows that response was satisfactory seen in 6 in group I and 3 in group II, good in 7 and 11 in group I, very good in 16 in group I and 14in group II and excellent in 6in group I and 7 in group II. The difference was significant (P< 0.05).

Graph IObjective evaluation of patients in both groups

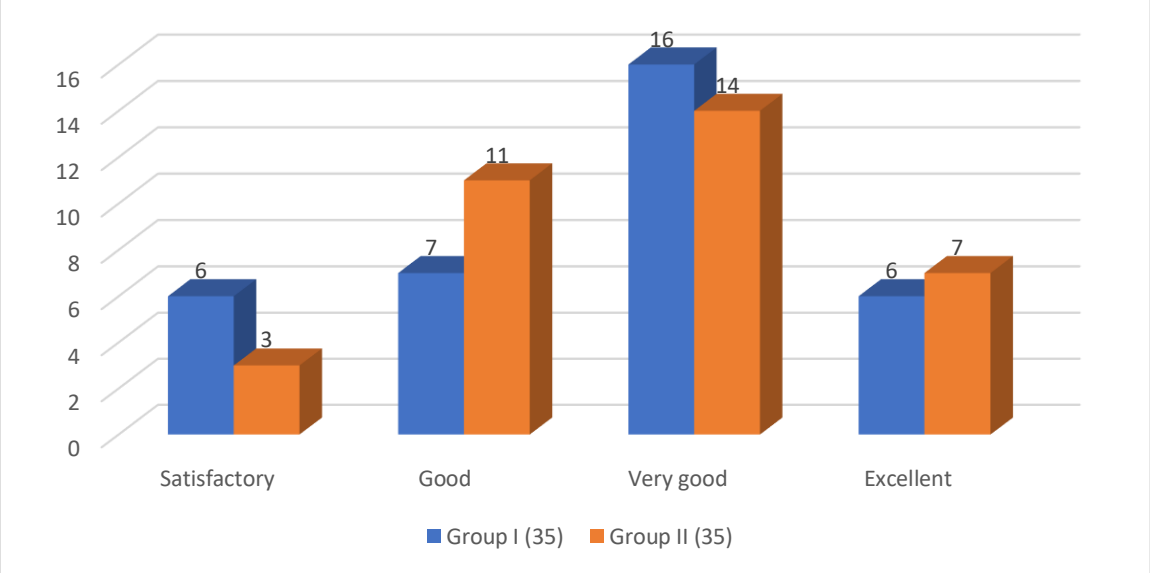

Table II Comparisonof objective score

Duration	Group I	Group II	P value
Baseline	30.2	29.7	0.05
Follow up	16.4	16.1	

Table IIshows that mean objective score at baseline in group I was 30.2 and at follow up was 16.4 and in group II at baseline was 29.7 and at follow up was 16.1. The difference was significant (P< 0.05).

DISCUSSION

Acne vulgaris, the pilosebaceous portion's most inflammatory disorder, affects children and teenagers and leaves behind a number of irritating and difficult-to-treat scars. Up to 80% of teenagers have it, making it a common illness that persists into adulthood. If acne is not treated, the skin's healing system may create damage that might lead to scarring.[6] Based on the amount of collagen that has either risen or decreased, two categories have been identified: atrophic and hypertrophic. Atrophic acne, which follows inflammatory acne, is caused by a reduction in collagen. The three types are ice pick, rolling, and boxcar. When acne leaves scars, it is considered a serious issue.[7] Severe scarring, especially in young adults, is associated with psychological pain and often results in a decrease inself-esteem and quality of life.Numerous invasive and non-invasive methods, each having pros and cons, can be used to treat acne scars.[8] Biochemical peels, retinoid tropical peels, and

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microdermabrasion are examples of non-invasive procedures; lasers and small needle radiofrequency equipment are examples of mini-invasive procedures; and laser ablation and surgery for acne scars are examples of invasive procedures. Acne scarring is commonly treated with ablative lasers; CO2 lasers outperform other techniques in this regard.[9]The present study compared fractional carbon dioxide laser technique and derma roller therapy in patients with post-acne scars.

We found that response was satisfactory seen in 6 in group I and 3 in group II, good in 7 and 11 in group I, very good in 16 in group I and 14 in group II and excellent in 6 in group I and 7 in group II. Gawdat HI et al[10] evaluated the advantages and disadvantages of fractional CO2 laser, microneedling, and platelet-rich plasma (PRP) in treating acne scarring. A total of 60 clinically diagnosed cases of post-acne scarring in both sexes were divided into three groups of 20 patients each. The degree of scarring was rated using the qualitative and quantitative grading system proposed by Goodman and Baron. PRP, microneedling, and fractional CO2 laser treatments were administered to patients in groups A, B, and C at monthly intervals for four sessions. The quantitative and qualitative grades of scars and adverse effects were noted at each session and one month after the last sitting. Fractional CO2 laser is significantly more successful than PRP (P = 0.00) based on the average percentage of improvement in quantitative grade at the end of four sessions; however, there was no significant difference between CO2 laser and microneedling (P = 0.106). Based on qualitative assessments, the fractional CO2 laser group showed statistically higher therapeutic efficacy than PRP and microneedling. No groups were adversely affected in any significant way.

We found that mean objective score at baseline in group I was 30.2 and at follow up was 16.4 and in group II at baseline was 29.7 and at follow up was 16.1. Harris et al[11] in their study, eight research examined skin needling in conjunction with conventional acne scarring therapies, while ten trials showed patients receiving skin needling alone. Twelve of the studies reported statistically significant improvements in scarring following needling. When needling was administered alone, the median number of treatments was three, the median time between treatments was four weeks, and the median needle length was 1.5 mm. Adverse events that were reported were rare and included milia, acne, "tram track" scarring, and post-inflammatory hyperpigmentation. No bacterial infections were reported.

The effectiveness and safety of microneedling as a treatment for atrophic facial acne scars were assessed by Dogra et al.[12] At monthly intervals, 36 patients with postacne atrophic facial scars (26 females and 10 males) received five dermaroller sittings under topical anesthetic. The acne scar assessment score was recorded at baseline and then at each visit to conduct an objective evaluation of improvement. Photographs taken before and after therapy were compared, and the improvement was scored on a quartile scale. One month following the last sitting, the final assessment was conducted. At the conclusion of the trial, patients were asked to rate the improvement in acne scars using a visual analog scale (VAS, 0–10 points). Thirty of the 36 patients finished the study. All of the patients had skin phototype IV, and their ages ranged from 18 to 40.After five dermaroller sessions, the mean acne scar assessment score decreased statistically significantly from 11.73 ± 3.12 at baseline to 6.5 ± 2.71. The majority of patients improved by 50–75%, according to the investigators' opinion based on photographic evaluation. By the end of the trial, "good response" was reported by 22 patients and "excellent response" by four, according to the visual analog scale (VAS) analysis results. The majority of patients took the operation well, with the two main side effects being tram-trek scarring in two patients and postinflammatory hyperpigmentation in five patients.

CONCLUSION

It was demonstrated that both methods were equally effective in treating scars from acne.

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