

ORIGINAL RESEARCH

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

Dr. Meenakshi Kapoor

Assistant Professor, Department of Dermatology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

Corresponding Author

Dr. Meenakshi Kapoor

Assistant Professor, Department of Dermatology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

Received: 23 January, 2017

Accepted: 28 February, 2017

ABSTRACT

Background: A prevalent skin condition that primarily affects the face but can also affect the back and chest, acne vulgaris manifests as non-inflammatory lesions, inflammatory lesions, and variable degrees of scarring. The present study compared fractional carbon dioxide laser technique and derma roller therapy in patients with post-acne scars. **Materials & Methods:** 64 patients with post-acne scars of both genders were classified into 2 groups of 32 each. Group I patients were treated with derma roller therapy and the other group was treated with fractional CO₂ laser every 4 weeks over a period of 24 weeks. Each patient had a baseline evaluation using the global acne scarring categorization, which was both objective and subjective. **Results:** Response was satisfactory seen in 7 in group I and 2 in group II, good in 9 and 10, very good in 11 and 13 and excellent in 5 and 7 in group I and II respectively. The difference was significant ($P < 0.05$). The mean objective score at baseline in group I was 28.2 and at follow up was 15.6 and in group II at baseline was 28.9 and at follow up was 15.1. The difference was significant ($P < 0.05$). **Conclusion:** Both the techniques were shown to be equally efficacious in therapy of post-acne scars.

Key words: Acne, inflammatory lesions, life

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

A prevalent skin condition that primarily affects the face but can also affect the back and chest, acne vulgaris manifests as non-inflammatory lesions, inflammatory lesions, and variable degrees of scarring.¹ Significant morbidity from acne is linked to psychological disorders like anxiety, depression, and poor self-image, as well as lasting scars. These conditions have a detrimental effect on quality of life. Acne scars are caused by damage to the skin, which sets off a series of actions that eventually heal the wound. Three steps make up the wound healing process: matrix remodeling, granulation tissue development, and inflammation.²

One of the most frequent causes of facial disfigurement is post-acne scarring. According to studies, 50% of acne sufferers have clinically significant scarring, while almost 80% of patients have some scarring. Adolescence and young adults frequently experience acne scarring, which can cause significant psychological suffering. Compared to people without scars, these patients have a far worse

dermatology life quality index (DLQI).³ Numerous techniques are commonly employed, including chemical peels, microdermabrasion, fractional photothermolysis (FP), non-ablative and 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. The combination of healing processes that starts new collagen deposition after ablation and collagen remodeling started by the zone of coagulation surrounding the ablated area is what causes the improvement in the appearance of acne scars after fractional CO₂ laser treatment.⁴ Significant improvement is achieved with CO₂ lasers, although at the expense of post-inflammatory hyperpigmentation and lengthy recovery periods. A new technique for treating scars without harming the epidermis is microneedling fractional radiofrequency (MFR).⁵ The present study compared fractional carbon dioxide laser technique and derma roller therapy in patients with post-acne scars.

MATERIALS & METHODS

This study comprised of 64 patients with post-acne scars of both genders. They were informed regarding the study and their written consent was obtained. Data such as name, age, gender etc. was recorded. Patients were classified into 2 groups of 32 each. Group I patients was treated with derma roller therapy

and the other group was treated with fractional CO2 laser every 4 weeks over a period of 24 weeks. Each patient had a baseline evaluation using the global acne scarring categorization, which was both objective and subjective. All findings were recorded and compared. P value less than 0.05 was considered significant.

RESULTS

Table I Objective evaluation of patients

Response	Group I (32)	Group II(32)	P value
Satisfactory	7	2	0.05
Good	9	10	
Very good	11	13	
Excellent	5	7	

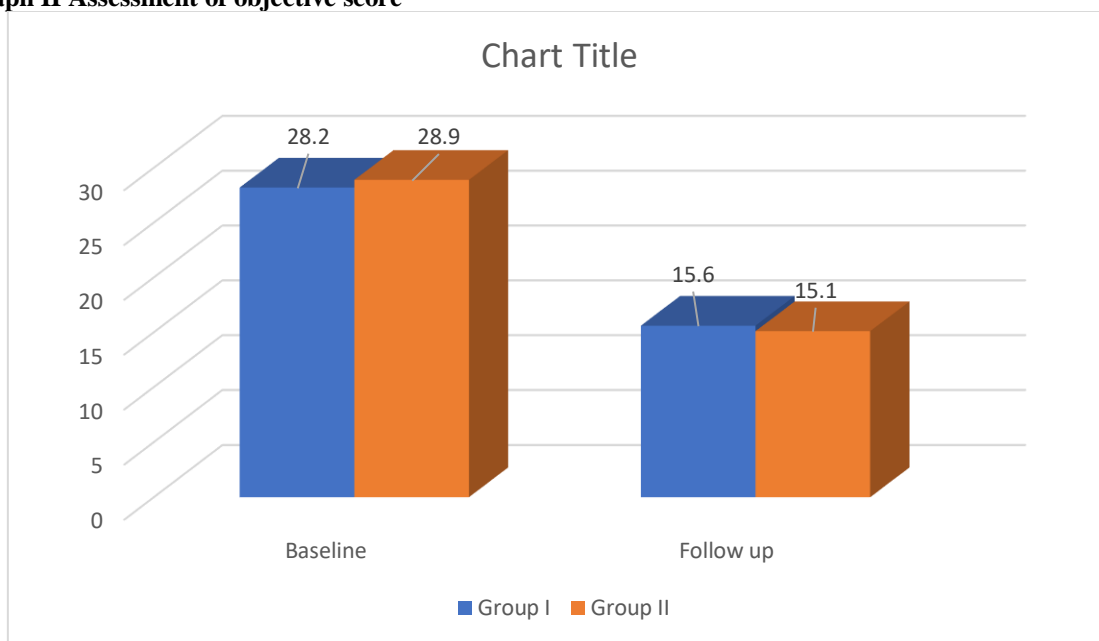
Table I shows that response was satisfactory seen in 7 in group I and 2 in group II, good in 9 and 10, very good in 11 and 13 and excellent in 5 and 7 in group I and II respectively. The difference was significant (P< 0.05).

Table II Assessment of objective score

Duration	Group I	Group II	P value
Baseline	28.2	28.9	0.04
Follow up	15.6	15.1	

Table II, graph I shows that mean objective score at baseline in group I was 28.2 and at follow up was 15.6 and in group II at baseline was 28.9 and at follow up was 15.1. The difference was significant (P< 0.05).

Graph II Assessment of objective score



DISCUSSION

The most inflammatory condition of the pilosebaceous portion, acne vulgaris, affects youth and adolescents and leaves behind several bothersome and challenging-to-treat scars. It is a prevalent condition that lasts into adulthood, with a prevalence of up to 80% among teenagers. Untreated acne may result in scarring as a consequence of skin damage caused by the skin's healing mechanism.⁶ Atrophic and hypertrophic are the two types identified based on the amount of collagen that has decreased or increased. Following inflammatory acne, atrophic

acne results from a decrease in collagen.⁷ There are three varieties: boxcar, rolling, and ice pick. Acne is regarded as a concerning problem when scarring occurs. Particularly in young adults, severe scarring is linked to psychological discomfort and frequently leads to a decline in self-esteem and quality of life.⁸ Acne scars can be treated with a variety of non-invasive and invasive techniques, each with advantages and disadvantages. Non-invasive techniques include biochemical peels, retinoid tropical peels, and microdermabrasion; small-invasive techniques include lasers and small needle

radiofrequency equipment; and invasive techniques include surgery for acne scars and laser ablation. Ablative lasers are frequently used to treat acne scarring; CO2 lasers produce greater results than other methods. Both ablative and non-ablative fractional devices have historically been utilized for.⁹The 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 7 in group I and 2 in group II, good in 9 and 10, very good in 11 and 13 and excellent in 5 and 7 in group I and II respectively. Dogra et al¹⁰evaluated the efficacy and safety of microneedling treatment for atrophic facial acne scars.Thirty-six patients (female--26, male--10) of postacne atrophic facial scars underwent five sittings of dermaroller under topical anesthesia at monthly intervals. Objective evaluation of improvement was performed by recording the acne scar assessment score at baseline and thereafter at every visit. Pre- and posttreatment photographs were compared, and improvement was graded on quartile score. Final assessment was performed 1 month after the last sitting. Patients were asked to grade the improvement in acne scars on visual analog scale (VAS, 0-10 point scale) at the end of study.Of 36 patients, 30 completed the study. The age group ranged from 18 to 40 years, and all patients had skin phototype IV or V. There was a statistically significant decrease in mean acne scar assessment score from 11.73 ± 3.12 at baseline to 6.5 ± 2.71 after five sittings of dermaroller. Investigators' assessment based on photographic evaluation showed 50-75% improvement in majority of patients. The results on visual analog scale (VAS) analysis showed "good response" in 22 patients and "excellent response" in four patients, at the end of study. The procedure was well tolerated by most of the patients, and chief complications noted were postinflammatory hyperpigmentation in five patients and tram-trek scarring in two patients.

We observed that the mean objective score at baseline in group I was 28.2 and at follow up was 15.6 and in group II at baseline was 28.9 and at follow up was 15.1.Gawdat HI et al¹¹ assessed the benefits and drawbacks of platelet-rich plasma (PRP), fractional CO2 laser, and microneedling in treating scarring from acne. Three groups of 20 patients each were formed from 60 clinically identified cases of post-acne scarring in both sexes. The qualitative and quantitative grading system put forward by Goodman and Baron was used to rate the degree of scarring. For four sessions, patients in groups A, B, and C received fractional CO2 laser, microneedling, and PRP treatments at monthly intervals, respectively. At each session, as well as one month following the last sitting, the quantitative and qualitative grades of scars and negative effects were recorded. Based on the average percentage of improvement in quantitative grade at the conclusion of four sessions, fractional

CO2 laser is substantially more effective than PRP ($P = 0.00$), but there was no significant difference between CO2 laser and microneedling ($P = 0.106$). In comparison to PRP and microneedling, the fractional CO2 laser group demonstrated statistically greater therapeutic efficacy based on qualitative evaluations. No groups experienced any notable negative impacts. Harris et al¹²Ten studies presented patients treated with skin needling alone, while eight studies discussed skin needling in combination with other treatments for acne scarring. All studies showed improvements in scarring after needling, with 12 reporting statistical significance. The median number of treatments when needling was used alone was three, the median duration between treatments was 4 weeks, and the median needle length used was 1.5 mm. Reported adverse events were infrequent and included post-inflammatory hyperpigmentation, "tram track" scarring, acne, and milia. There were no reports of bacterial infections.

CONCLUSION

Authors found that both the techniques were shown to be equally efficacious in therapy of post acne scars.

REFERENCES

1. Goodman GJ, Baron JA. Postacne scarring: A qualitative global scarring grading system. *Dermatologic surg.* 2006;32(12).
2. Stem R. The prevalence of acne on the basis of physical examination. *J Am Academy Dermatology.* 1992;26:931-35.
3. Reich A, Jasiuk B. Acne vulgaris: what teenagers think. *Dermatol Nursing.* 2007;19(1):49-64.
4. Adityan B, Thappa DM. Profile of acne vulgaris: A hospital-based study from South India. *Indian J Dermatol Venereol Leprol.* 2009;75:272-8.
5. Cowin AJ, Brosnan MP, Holmes TM, Ferguson MWJ. Endogenous inflammatory response to dermal wound healing in the fetal and adult mouse. *Dev Dyn.* 1998; 212:385-93.
6. Goodman G. Post acne scarring: a review. *J Cosmet Laser Ther.* 2003;5:77-95.
7. Sadick NS, Palmisano L. Case study involving use of injectable poly-L-lactic acid (PLLA) for acne scars. *J Dermatolog Treat.* 2009;20:302-7.
8. Gozali MV, Zhou B. Effective treatments of atrophic acne scars. *J Clin Aesthet Dermatol.* 2015;8:33-40.
9. Nofal E, Helmy A, Nofal A, Alakad R, Nasr M. Platelet-rich plasma versus CROSS technique with 100% trichloroacetic acid versus combined skin needling and platelet rich plasma in the treatment of atrophic acne scars: A comparative study. *Dermatol Surg.* 2014;40:864-73.
10. Dogra S, Yadav S, Sarangal R. Microneedling for acne scars in Asian skin type: an effective lowcost treatment modality. *Journal of cosmetic dermatology.* 2014 Sep;13(3):180-7.
11. Gawdat HI, Hegazy RA, Fawzy MM, Fathy M. Autologous platelet rich plasma: Topical versus intradermal after fractional ablative carbon dioxide laser treatment of atrophic acne scars. *Dermatol Surg.* 2014;40:152-61.

12. Harris AG, Naidoo C, Murrell DF. Skin needling as a treatment for acne scarring: an up-to-date review of the literature. International journal of women's dermatology. 2015 Jun 1;1(2):77-81.