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Original Research Article

Comparative study of efficacy and safety of fractional CO2 laser and microneedling fractional radiofrequency (MnRF) in the treatment of striae distensae

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ABSTRACT

Introduction: Striae Distensae (SD) are common disfiguring skin conditions having significant psychological impact on affected patients, especially in young healthy women. Management of striae poses a therapeutic challenge. Recently, fractional CO2 laser and microneedling radio frequency have shown to be efficacious in the treatment of SD. However, there is paucity of such studies in Indian population. Hence, we intend to conduct the present comparative study.

Aim and Objectives: To compare the efficacy and safety of fractional CO2 laser and Microneedling fractional radiofrequency (MnRF) in the treatment of SD.

Materials and Methods: A total of 30 patients (18-40 years) having SD, attending the out-patient department at the Department Of Dermatology, Venereology and Leprosy, Adichunchanagiri Hospital and Research Centre, B.G. Nagara were alternately allocated into group-A (fractional CO2 group) and group-B (MnRF group). Patients in both the groups received four sequential treatments with an interval of 4 weeks between each session. Clinical assessment of the improvement of striae was done based on Global Improvement Scale (GIS) at the end of 1 month after the last session, by a Side-by-side comparison of Pre-operative photographs. In addition, patients were asked to provide their opinion on improvement of striae using the patient satisfaction Visual Analogue Score (VAS).

Results: In our study, at the end of 1 month after the last treatment session, according to GIS, clinical improvement of SD was better in Group B when compared to Group A (p=0.000023), which was statistically significant. Patients in Group B were more satisfied with their treatment than the patients in Group A, according to the patient satisfaction VAS score, which was again found to be statistically significant (p=0.00086).

Five patients (33.33%) in Group-A had post-inflammatory hyperpigmentation.

Conclusion: In the present study, MnRF was found to be more efficacious and safe than fractional CO2 laser in clinical improvement of striae distensae.

1. Introduction

Striae Distensae [SD] or stretch marks are common disfiguring skin conditions characterized by linear atrophic plaques that are initially erythematous (striae rubra), and overtime become progressively atrophic and hypopigmented (striae alba).[1] Although, SD does not pose any serious medical problems But, may have significant psychological and psychosocial impact on affected patients, especially in young healthy women.[2]

A variety of treatment modalities have been advocated for the treatment of SD, including topical preparations like topical tretinoin (0.1%), trofolastin cream, peels such as trichloroacetic acid (13%, 20%, 30%) and glycolic acid (50%,70%) peels, but with limited efficacy. Lasers and light-based devices like 308-nm excimer laser, 585-nm pulse dye laser, 1064-nm Nd-YAG laser, ablative/ non-ablative lasers and intense pulse light have also been tried for the treatment

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of SD but with inconsistent results.[3] Till date, no definite gold standard treatment modality for the treatment of SD has been determined and hence, there is a need for newer therapeutic modalities that are more efficacious and safe with minimal downtime.

In recent years, fractional photothermolysis in laser therapy has been developed in management of scars and SD. These laser devices deliver laser energy in microarray pattern, producing small columns of tissue destruction in epidermis and dermis, termed micro thermal zones (MTZs), with intervening islands of healthy tissue.[4] Fractional CO2 laser has been shown to be highly efficacious for resurfacing as well as for the treatment of scars due to its ability to stimulate collagen and regenerate elastin,[5] and of late, has demonstrated significant improvement in SD as well.[6]

A recently developed, minimally invasive novel technique is microneedling fractional radiofrequency. Microneedles penetrate into skin with minimal injury to epidermis and once within the dermis, radiofrequency energy is delivered through needles. The heat generated by the resistance offered to passage of radiofrequency energy causes dermal remodelling, neoelastogenesis and neocollagenogenesis resulting in dermal thickening and skin rejuvenation. Microneedling fractional radiofrequency (MnRF) treatment has demonstrated significant improvement of acne scars, open pores and skin rejuvenation.[7] The histopathological analysis of SD, especially striae alba being similar to a scar,[8] MnRF provides a very promising option.

In spite of emerging evidence of therapeutic efficacy and safety of these two treatment modalities in Western and Asian population, there is a paucity of such studies in Indian population. Hence, we intend to do the present study to compare the efficacy of fractional CO2 laser & microneedling fractional radio frequency in the treatment of patients with SD.

2. Materials and Methods

2.1. Source of data

The study was conducted at the Department Of Dermatology, Venereology and Leprosy, Adichunchanagiri Hospital and Research Centre, B.G. Nagara, Nagamangla Taluk, Mandya District, on an Out-patient basis.

2.2. Study period

18 months

2.3. Study design

Randomized controlled study.

2.4. Sample size

30.

2.5. Sampling method

Convenient Sampling

2.6. Analysis

Data collected was entered into Microsoft Xcel 2016 and analyzed using SPSS 20.0. Descriptive statistics was expressed using mean and SD. For test of significance, paired *t* test and ANOVA test were used. P value < 0.05 was considered significant at 90% confidence interval.

2.7. Inclusion criteria

1. Patients who are willing to participate in the study.
2. Patients with Fitzpatrick's skin types III-V between the age group 18-40 years with striae distensae.

2.8. Exclusion criteria

1. Patients who are not willing to participate in the study.
2. Patients below 18 years and above 40 years.
3. Pregnant and lactating women.
4. Patients with history of active infections like Herpes, type I or II.
5. Patients with history of photosensitive disorders like lupus erythematosus, dermatomyositis.
6. Patients with Cushing's disease and Ehlers-Danlos syndrome.
7. Patients with history of propensity for keloid formation and vitiligo.
8. Patients with implants, like pacemaker or cochlear implants.
9. Patients who have received treatment for laser skin resurfacing in the past 6-12 months on the striae.
10. Patients with unrealistic expectations, or not willing to give written informed consent.

2.9. Procedure of the study

A total of 30 patients with striae distensae attending the Dermatology out-patient department, satisfying the aforementioned inclusion and exclusion criteria were recruited in the study. Approval was obtained from institutional ethical committee and a written informed consent was taken from all the patients before enrolling them in the study. A detailed dermatological examination of the striae along with photographs of each patient was taken before and after the procedure with emphasis on striae distensae.

2.10. Sampling

The patients were allocated alternatively to Group A and Group B

Group A: 15 patients in every session were treated with fractional CO2 laser.

Group B: 15 patients in every session were treated with microneedling fractional radiofrequency.

2.10.1. Group A: Fractional CO2 laser and treatment protocol.

Patients with striae distensae were subjected to receiving four sequential fractional CO2 laser (DERMA INDIA FUTURA RF30) treatments with an interval of 4 weeks between each session. The instrument characteristics were as follows:

Laser type- Ultra pulse, 10600 nm, CO2 tube
Condenser focus- f=50mm
Spot size- 0.2mm
Pulse frequency- 33.3Hz
Pulse Duration- 0.1-10ms
Distance- 0.1-2.6mm
Interval- 0-6s
Repeat- 1-5000ms
Overlap- 1-20 times
Average power-30W or 30000 milli-joule per second
Scan graphics- square, rectangle,round, triangle, oval and diamond
Dot quantity- 400 dots max
Scan mode- sequence, random and maximum distance
Pulse energy- 10mJ to 30mJ is optional for each dot

Prior to each treatment session, EMLA cream (Lignocaine 2.5% and Prilocaine 2.5%) was applied to the target regions of striae for 40 minutes followed by gentle cleansing. The procedure area was painted with povidine iodine and cleaned with 70% isopropyl alcohol as a disinfectant using sterile precautions.

In each session, two passes were administered. The laser procedure was performed with the following settings-

Power: 30%, Scanning size: 3mm x 3mm to 10mm x 10mm according to the width of the lesion, Distance: 1.1mm, Duration: 2ms.

Post procedure, the sites were wiped gently with cold water and ice pack was applied for 5 mins to alleviate discomfort and minimize swelling. Patients were advised to apply hyaluronic acid based moisturiser post-treatment. Any post-treatment erythema was treated with topical steroid antibiotic cream provided by investigator and post-procedure pain was managed with non-steroidal anti-inflammatory drugs.

If the patient complained of severe erythema, edema or if any evidence of post inflammatory hyperpigmentation was seen post procedure, we changed our laser setting by lowering the energy.

2.10.2. Group B: Microneedling fractional radiofrequency device and treatment protocol.

Patients with striae distensae were subjected to four sequential microneedling radiofrequency (DERMA INDIA MR 16-2SB) treatments with an interval of 4 weeks between each session. The energy delivery system consisted of a disposable tip with 25 Gold-plated microneedle electrodes with a maximum energy output of 50W. The depth of the needles was set between 0.5-3mm, depending on the anatomical location of SD. When the needles reach the pre-defined insertion depth the RF is emitted selectively heating the dermis while sparing the epidermis. The time of needles being out was 450ms and time difference of radiofrequency and needles being out was 10ms for each session.

Prior to each treatment session, EMLA cream (Lignocaine 2.5% and Prilocaine 2.5%) was applied to the targeted regions of striae distensae for 40 minutes followed by gentle cleansing. The procedure area was painted with povidine iodine and Cleaned with 70% isopropyl alcohol as a disinfectant using sterile precautions.

In each session, two passes were administered. Penetration depth of the needle was between 0.5-3mm, depending upon the location. Disposable micro radiofrequency needles were used for every patient in each session.

Post procedure, the sites were wiped gently with cold water and ice pack was applied for 5 mins to alleviate discomfort and minimize swelling.

Patients were advised to apply hyaluronic acid based moisturiser post treatment. Any post treatment erythema was treated with topical steroid antibiotic cream provided by investigator and post procedure pain was managed with non-steroidal anti-inflammatory drugs.

2.11. Clinical evaluation

Clinical assessment of improvement of striae was done according to Global Improvement Scale by a side by side comparison of Pre-operative and post-operative photographs taken at their first visit and at the end of 1 month after the last session which was as follows:

2.11.1. Global Improvement Scale

Grade 0- Worsened
Grade I- 0-30% - Minimal improvement
Grade II- 31-50% - Moderate improvement
Grade III- 51-80% - Marked improvement
Grade IV- >81% - Near total improvement

In addition, patients were asked to provide their opinion about improvement of striae using the following score:

2.11.2. Patient Satisfaction Score

1. Not satisfied
2. Slightly satisfied
3. Satisfied
4. Very satisfied
5. Extremely satisfied

Any adverse events were recorded in detail at each treatment session and follow up visits.

3. Results

A total of 30 patients(n=30) with striae distensae, attending the out-patient department of Dermatology, Venereology & Leprosy, Adichunchanagiri institute of medical sciences, fulfilling the inclusion and exclusion criteria were enrolled in the study. Patients were allocated alternately into Group A and Group B. 15 patients in Group A were treated with Fractional CO2 laser and 15 patients in Group B were treated with MnRF.

In the present study, out of the 30 patients in the study group, males constituted 30% (n=9) and females 70%(n=21). An overall female preponderance was observed, with male to female ratio being 1:2.3.

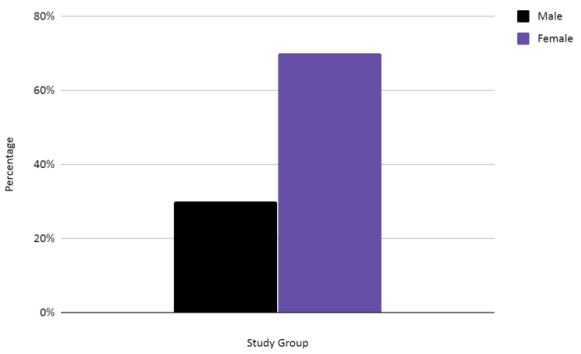

Fig. 1: Graph showing the sex distribution ratio of Striae Distensae in study population.

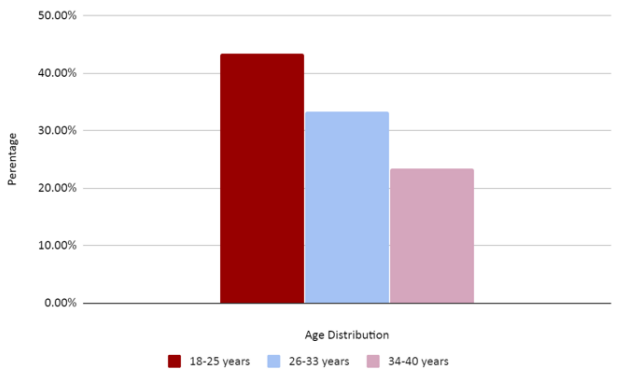

Fig. 2: Graph showing the age distribution ratio of Striae Distensae in study population

In the present study, striae distensae was seen most commonly in the age group of 18-25 yrs (43.3%), followed by the age group of 26-33 yrs (33.3%), and the age group of 34-40 yrs (23.3%).

The mean age of the patients was 28.8 years.

In the present study, the most common cause of striae distensae was observed to be weight gain (33.33%, n=10), followed by exercise (30%, n=9), topical steroid misuse (20%, n=6) and growth spurt (16.66%, n=5).

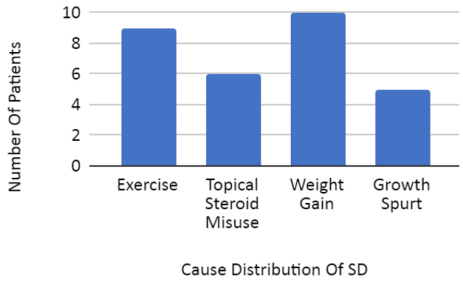

Fig. 3: Graph showing the cause distribution of Striae Distensae in study population.

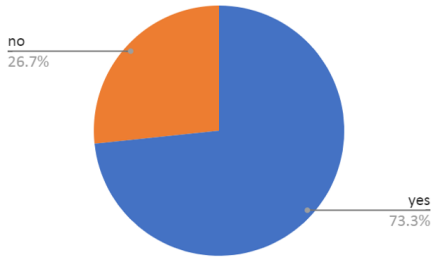

Fig. 4: Graph showing the family history distribution of Striae Distensae in study population.

In the present study, 73.3%(n=22) of the patients had a positive family history of striae distensae.

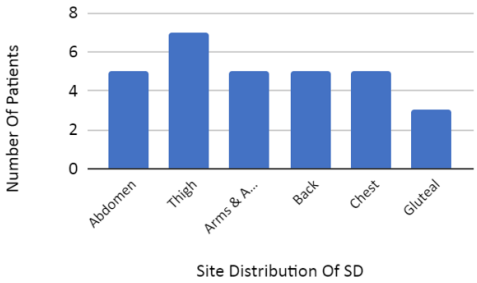

Fig. 5: Graph showing the site distribution of Striae Distensae in study population. Most common site of SD was over the thighs.

In the present study, the most common anatomical distribution of striae was observed over the thighs (23.33%, n=7), followed by abdomen(n=5), back(n=5), chest(n=5), arms(n=5) and gluteal region(n=3).

3.1. Post treatment assessment in group A patients

15 patients were subjected to 4 sequential treatments of fractional CO2 laser, at an interval of 4 weeks in-between; assessment was done at the end of 1 month after the last treatment session (4 sessions).

3.1.1. Global Improvement Score assessment of post treatment reduction of SD in Group A:

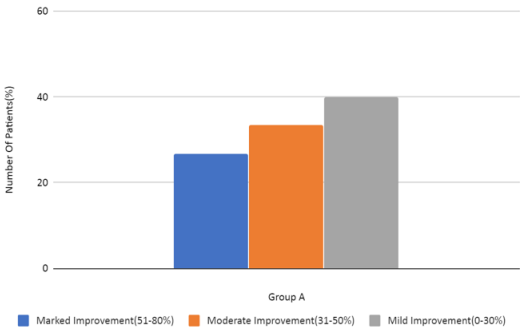

Fig. 6: Graph showing the Global Improvement Score in Group A patients.

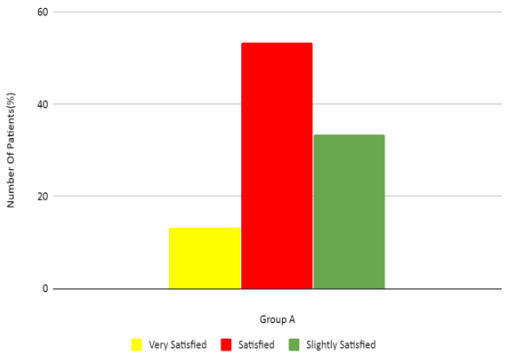

Fig. 7: Graph showing the Patient Satisfaction Score in Group A patients.

At the end of 1 month after last treatment session (4 sessions), out of the fifteen participants, 4 patients (26.66%) had marked improvement, 5 patients (33.33%) had moderate improvement, and 6 patients (40%) had minimal improvement.

The mean improvement score after treatment was 1.86.

3.2. Patient Satisfaction Score:

At the end of 1 month after last treatment session (4 sessions), out of the fifteen patients, 2 patients (13.33%) were very satisfied with the treatment, 8 patients (53.33%) were satisfied, and 5 patients (33.33%) were slightly satisfied with the treatment.

The mean of patient satisfaction VAS score after treatment was 1.79.

None of the participants reported worsening of the striae.

3.3. Post-treatment assessment of group B patients

15 patients were subjected to 4 sequential treatments of microneedling fractional radiofrequency, at an interval of 4 weeks in-between; assessment was done at the end of 1 month after the last treatment session (4 sessions):

3.3.1. Global Improvement Score assessment of post treatment reduction of SD in Group B

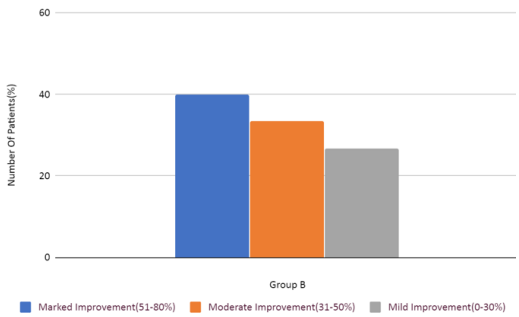

Fig. 8: Graph showing the Global Improvement Score in Group B patients.

At the end of 1 month after last treatment session (4 sessions), out of the fifteen participants, 6 patients (40%) had marked improvement, 5 patients (33.33%) had moderate improvement, and 4 patients (26.66%) had minimal improvement.

The mean improvement score after treatment was 2.13.

3.3.2. Patient Satisfaction Score

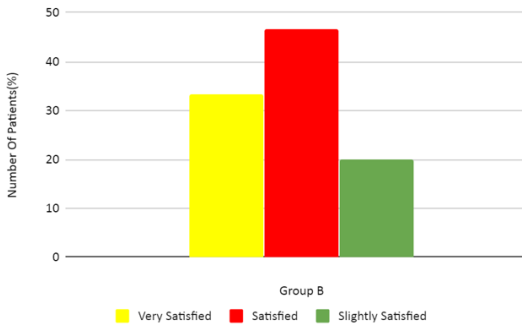

Fig. 9: Graph showing the Patient Satisfaction Score in Group B patients.

At the end of 1 month after last treatment session (4 sessions), out of the fifteen patients, 5 patients (33.33%) were very satisfied with the treatment, 7 patients (46.44%) were satisfied, and 3 patients (20%) were slightly satisfied with the treatment.

The mean of patient satisfaction VAS score after treatment was 2.1

None of the participants reported worsening of the striae.

3.3.3. *Comparison of clinical improvement of SD according to Global Improvement Score in group A and group B*

At the end of 1 month after the last treatment session (4 sessions), 40% of patients(n=6) in Group B had marked improvement compared to only 26.6% of patients(n=4) in Group A. In both the groups, equal number of patients (33.3%; n=5) showed moderate improvement.

In the present study, at the end of 1 month after the last treatment session, the clinical improvement of SD in Group B was better when compared to Group A, which was found to be statistically significant (p=0.000023).

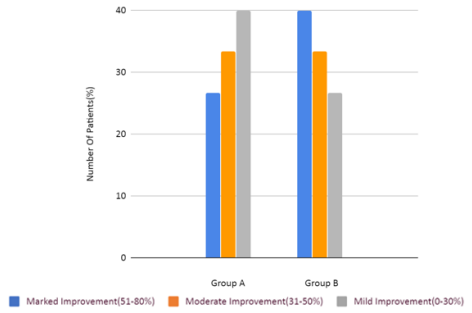

Fig. 10: GIS assessment of post treatment reduction of SD comparing Group A & Group B.

3.3.4. *Comparison of mean Global Improvement Score in group A and group B*

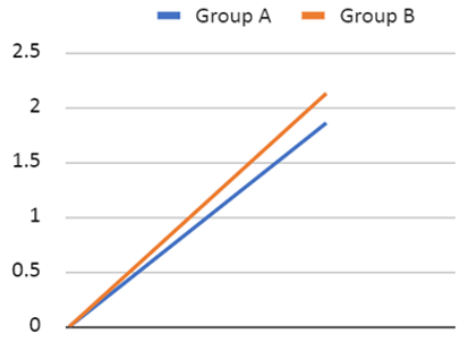

Fig. 11: Comparison of mean 1. Global Improvement Score in group A and group B:

Table 1: Comparing mean of 1. Global Improvement Score after treatment in group A and group B

	Group A	Group B	*p* Value
GIS score after treatment	1.86	2.13	<0.05

The mean Global Improvement Score at the end of 1 month after the last treatment session in Group B was 2.13 compared to 1.86 in Group A.

3.3.5. *Comparison of patient satisfaction score after treatment of SD in group A and group B*

At the end of 1 month after the last treatment session (4 sessions), 33.3% of patients(n=5) in Group B were very satisfied with the treatment as compared to only 13.33% of patients(n=2) in Group A.

The patient satisfaction VAS score after treatment in Group B patients was better when compared to Group A patients, which was found to be statistically significant (p=0.00086).

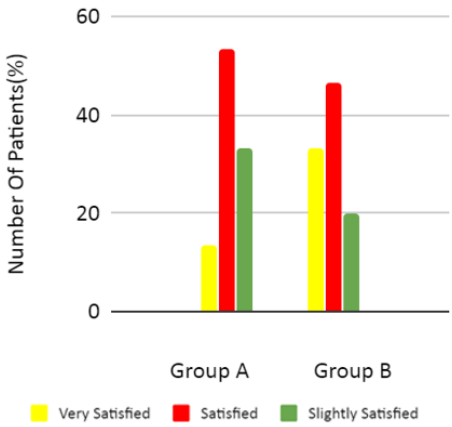

Fig. 12: Patient Satisfaction Score of post treatment reduction of SD comparing Group A & Group B

Table 2: Comparing mean of Patient Satisfaction Vas Score after treatment in group A and group B:

	Group A	Group B	p Value
VAS after treatment	1.8	2.1	<0.05

The mean Patient Satisfaction VAS Score after treatment was 2.1 in Group B as compared to 1.8 in Group A.

The adverse effects observed and reported by patient are as follows:

Transient post procedural edema and erythema (lasting 1 to 2 days), was seen in both the groups, the intensity of which decreased in subsequent sittings. Transient post procedure pain lasting 1-2 days was experienced by 5 patients in Group A (33.33%) compared to 2 patients in Group B (13.33%). Post inflammatory hyper-pigmentation (PIH) was seen in 5 patients in Group A (33.33%), which resolved almost completely within 3 months with intervention. None of the patients in Group B experienced PIH.

None of the patients in both the groups experienced any infection, ulcer, burn or scar.

3.4. Method of statistical analysis of results

A paired t test was conducted to measure the number of standard errors away from 0. The *t* value was measured at +/- 2.570581, showing the coefficient as a significant predictor.

3.4.1. Group-A Pre-treatment and post-treatment photographs

Fig. 13: a: Pre-treatment Photograph, b: Post-treatment Photograph

Fig. 14: a: Pre-treatment Photograph, b: Post-treatment Photograph

3.4.2. Group- B pre-treatment and post-treatment photographs

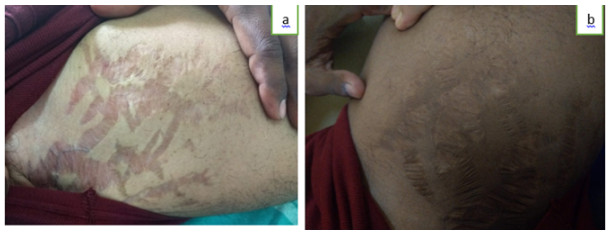

Fig. 15: a: Pre-treatment Photograph, b: Post-treatment Photograph

4. Discussion

30 patients with striae distensae, attending the out-patient department of Dermatology, Venereology and Leprosy, Adichunchanagiri Institute of Medical Sciences, B.G Nagara were inducted in the study.

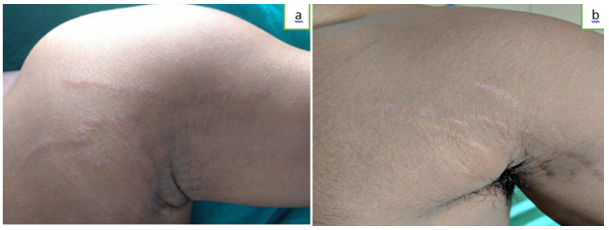

Fig. 16: a: Pre-treatment Photograph, b: Post-treatment Photograph

SD or stretch marks are common disfiguring skin condition characterized by linear atrophic plaques that are initially erythematous (striae rubra), and overtime become progressively atrophic and hypopigmented (striae alba). Though, SD do not pose any serious medical problems but may cause significant cosmetic problems, especially in young women.[1] They are twice as common in females and are reported in the age group of 15–50 years.

In our present study, an overall female preponderance was seen(M:F=1:2.3). This could be attributed to the fact that females are more cosmetically conscious and seek treatment earlier than males.

The mean age of patients in our study was 28.8 years, and was most commonly seen in the age group of 18-25 years. This was similar to the age distribution (mean=30.17 years) seen in a study conducted by Naeini et al.

In the present study, 73.3% of patients(n=22) had positive family history. Our observation was similar to a study conducted by Ryu et al, wherein 66.6% of the patients(n=20) had a positive family history.

Weight gain was the most common cause of SD observed in our study, constituting 33.33%(n=10). Our observation was in concordance with studies done by Naeini et al (all the patients) and Ryu et al (66.6%, 20 patients), wherein the most common cause of SD was weight gain.

4.1. Group A

15 patients were subjected to 4 sequential treatments of fractional CO2 laser, at an interval of 4 weeks and, assessment was done at the end of 1 month after the last treatment session (4 sessions):

In recent years, fractional photothermolysis in laser therapy has been developed in management of scars and SD. Ablative fractional laser treatment includes the short-pulsed 10,600-nm CO2 laser. It delivers laser energy in microarray pattern, producing small columns of tissue destruction in epidermis and dermis, known as micro thermal zones (MTZs), with intervening islands of healthy tissue. This results in epidermal necrosis followed by collagen synthesis. Fractional CO2 laser has been shown to be highly efficacious for resurfacing as well for the treatment of scars due to its ability to stimulate collagen and

regenerate elastin, and of late, has demonstrated significant improvement of SD as well. The clinical improvement is also reflected histopathologically, as there is increase in thickness of epidermis and dermis

4.2. Post treatment assessment in group A patients

A. Global Improvement Score assessment of post treatment reduction of SD in group A : At the end of 1 month, after last treatment session (4 sessions), according to Global Improvement Score, out of the 15 patients, 4 patients (26.66%) showed marked improvement of striae, 5 patients (33.33%) showed moderate improvement and 6 patients (40%) showed minimal improvement.

The mean global improvement score after treatment in Group A was 1.86.

On the basis of Global Improvement Score, our study results were compared with similar other individual studies, which is as follows:

In our study, marked improvement was seen in 26.66% patients (n=4), which was comparable to the study done by Tabaie et al (29.2%, n=7), but was in contrast to the study done by Lee et al (51.3%, n=14).

In the present study, moderate improvement was seen in 33.3% patients (n=5), which was similar to the study done by Lee et al (33.3%, n=9), but was in contrast to the study done by Tabaie et al (54.2%, n=13).

In our present study, at the end of 1 month after the last session (4 sessions) the mean clinical improvement score was 1.86. In contrast, the mean improvement score in the study done by Lee et al was 2.5 and in the study done by Tabaie et al was 2.1.

4.3. Patient Satisfaction Visual Analogue Score:

At the end of 1 month, after last treatment session, according to Patient satisfaction score, out of the 15 patients, 2 patients (13.33%) were very satisfied, 8 patients (53.33%) were satisfied, and 5 patients (33.3%) were slightly satisfied with their treatment.

The mean Patient Satisfaction VAS Score after treatment in Group A was 1.8.

On the basis of Patient Satisfaction Score, our study results were compared with similar other individual studies, which is as follows:

In our study, 13.33% patients (n=2) were very satisfied with the treatment outcome, which was comparable to the study done by Tabaie et al(16.66%, n=4), but was in contrast to the study done by Lee et al(22.2%, n=6).

In the present study, 33.3% patients (n=5) were satisfied with the treatment outcome, which was similar to the study done by Lee et al(51.9%, n=14), but was in contrast to the study done by Tabaie et al(79.16%, n=19).

In our present study, at the end of 1 month after the last session(4 sessions), the mean improvement in Patient Satisfaction VAS score was 1.8, in contrary, to the studies done by Lee et al (2.04) and Tabaie et al (2.1).

4.4. Group B

15 patients were subjected to 4 sequential treatments of microneedling fractional radiofrequency, at an interval of 4 weeks and, assessment was done at the end of 1 month after the last treatment session(4 sessions):

A recently developed minimally invasive novel technique is microneedling fractional radiofrequency. Microneedles penetrate into skin with minimal injury to epidermis and once within the dermis, radiofrequency energy is delivered through needles. The heat generated by the resistance offered to passage of radiofrequency energy causes dermal remodelling, neoelastogenesis and neocollagenogenesis resulting in dermal thickening and skin rejuvenation. The histopathological analysis of SD, especially striae alba being similar to a scar, MnRF provides a very promising option.

4.5. Post treatment assessment of patients with SD in group B:

A) Global Improvement Score assessment of post treatment reduction of SD in group B: at the end of 1 month, after last treatment session (4 sessions) with microneedling fractional radiofrequency device, according to Global Improvement Score, out of the 15 patients in this group, 6 patients (40%) showed marked improvement, 5 patients (33.33%) showed moderate improvement, and 4 patients(26.6%) showed mild improvement.

The mean global improvement score after treatment in Group B was 2.13.

B) Patient Satisfaction Score : At the end of 1 month, after last treatment sessions, according to Patient Satisfaction Score, out of the 15 patients, 5 patients (33.33%) were very satisfied, 7 patients (46.6%) were satisfied, and 3 patients (20%) were slightly satisfied.

The mean Patient Satisfaction VAS Score after treatment in Group B was 2.1.

However, with extensive review of literature, there were no similar individual studies to compare our study results.

4.6. Comparison of treatment response in group A and group B

There have been several comparative studies with different modalities of treatment like fractional ablative, non-ablative lasers, Intense Pulse Light, micro needling, various topical preparations like topical tretinoin (0.1%), trofolastin cream and peels such as trichloroacetic acid (13%,20%,30%) and glycolic acid (50%,70%). Review of literature showed a single study by Sobhi et al, wherein efficacy of fractional CO2 laser and microneedling radio frequency in the treatment of SD were compared, which was similar to our

Table 3: Comparison of global improvement score results (group a) with other study results

	Lee et al	Tabaie et al	Present Study (Group A)
Marked Improvement	51.3%(n=14)	29.2%(n=7)	26.66%(n=4)
Moderate Improvement	33.3%(n=9)	54.2%(n=13)	33.3%(n=5)
Mild Improvement	7.4%(n=2)	16.7%(n=4)	60%(n=6)
Mean Improvement	2.59	2.1	1.86

Table 4: Comparison of Visual Analogue Vas Score results (group a) with other study results

	Lee et al	Tabaie et al	Present Study(Group A)
Very Satisfied	22.2%(n=6)	16.66%(n=4)	13.33%(n=2)
Satisfied	51.9%(n=14)	79.16%(n=19)	53.33%(n=8)
Slightly Satisfied	18.1%(n=5)	4.16%(n=1)	33.3%(n=5)
Mean Improvement	2.04	2.1	1.8

study.

4.7. Comparison of Global Improvement Score assessment of post treatment reduction of SD in Group A and Group B

40% of patients (n=6) in Group B had marked improvement compared to only 26.6% of patients (n=4) in Group A

Overall treatment outcome in Group B patients (microneedling radio frequency) was better than in Group A patients (fractional CO2 laser), which was found to be statistically significant (p=0.000023). Our observations were in concordance with study done with Sobhi et al. but in their study there was no statistically significant difference(p=0.241).

4.8. Comparison of Patient Satisfaction Score in Group A and Group B at the end of treatment

33.3% of patients(n=5) in Group B were very satisfied with the treatment as compared to only 13.33% of patients(n=2) in Group A.

Overall patient satisfaction score in Group B patients was better than in Group A patients, which was found to be statistically significant (p=0.00086). Our observations were similar to study done by Sobhi et al. but in their study, there was no statistically significant difference (p=0.409)

4.9. In the present study, the adverse effects reported were

Transient post procedural edema and erythema, was seen in both the groups, the intensity of which decreased in subsequent sittings.

Transient post procedure pain lasting 1-2 days was experienced by 5 patients in Group A(33.33%) as compared to 2 patients in Group B(13.33%).

Post inflammatory hyper-pigmentation (PIH) was seen in 5 patients in Group A(33.33%), which resolved almost completely within 3 months with intervention. None of the patients in Group B experienced PIH.

Our observations were in concordance with the study done by Sobhi et al., wherein, PIH developed in 52.9% (n=9) of the patients treated with fractional CO2 laser, whereas none in the areas treated with microneedling fractional radiofrequency.

5. Conclusion

In our present study, microneedling radiofrequeny (patients treated in Group B) was found to be more efficacious and safe than fractional CO2 laser (patients treated in Group A) in clinical improvement of striae distensae.

The incidence of PIH with fractional CO2 laser was significantly higher.

6. Source of Funding

None.

7. Conflict of Interest

None.

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