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THE STUDY USE LASER PRO-YELLOW IN TREATMENT OF VASCULAR SKIN DISORDERS

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Abstract
To do away with this dermatological problem of visible blood vessels, and discoloration, the study has explored whether the pro-yellow laser therapy is efficacious. The research uses a strict approach to gauge the efficiency of pro-yellow laser in treating such conditions. Through clinical checks and quantitative analysis consisting of RGB histogram analysis, it looks at changes in affected skin area, mean RGB values as well as standard deviations pre and post treatment. Our results are telling: there was a significant decline from 123020 to 115020 in the count of affected skin dots, followed by substantial improvement from 186.38 to 166.728 in average RGB values in acid blue (IFI7). Additionally, in this regard their post-treatment deviation from the mean fell by about 14.324 to nearly 12.580. These findings show that pro-yellow laser therapy effectively reduces the affected area, enhances skin coloration and achieves uniformity of color distribution among vascular disorder patients Conversely, our research highlights promising potentials for non-invasive pro yellow laser treatment that would be effective for individuals who suffer from vascular skin pathologies and don't want surgery because they find it aesthetically unattractive when looking at themselves afterward or just simply don't want any scars left on their body.

Introduction
Rosacea, facial telangiectasia, facial erythema, port-wine stain nevus and others associated with skin vascularity are the vascular diseases which are psychologically worse. It is important to note that women are more likely to experience these particular problems of vascular skin than men [1]. When it comes to conditions of vascular skin like rosacea, face telangiectasia, facial erythema, port-wine stain nevus among others it is so crucial to know that such illnesses lead to negative impact on mental health. This means that people with such conditions of their blood vessels on the skin tend to have lower levels of overall psychological well-being. In addition, it is important to note that these particular vascular skin disorders are more often found among females indicating a possible gender disparity in the occurrence of these ailments [1].
Goldman et al.'s innovative work done in the 1960s laid ground for applying light systems to treat cutaneous vascular diseases [2]. Many laser systems have been developed and used since then for this purpose. Some examples include Nd:YAG lasers (1064 nm), KTP lasers (532 nm), intense pulsed light (IPL), alexandrite lasers (755 nm), pulsed dye laser (585 and 595 nm) and diode lasers (800-900nm)

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[3]. The continued use of the laser systems suggests that they are highly effective and relevant for addressing vascular disorders and other dermatological problems. Newly coming up is a substitute for this known as pro-yellow laser (577nm). This technology has gained popularity as an alternative therapy option for vascular lesions. By introducing the pro-yellow laser into the market, the number of treatment options has grown to give both patients and doctors more tools in their arsenal against these ailments [4,5]. Mainly, oxyhemoglobin acts as the target chromophore on vascular lesions followed by deoxyhemoglobin and methemoglobin. This fact is important since it assists in choosing and improving laser systems along with treatment settings that may be useful to both physicians and researchers. Understanding chromophores involved in vascular lesions helps to develop a focused therapeutic approach leading to improved patient outcomes eventually [6]. To establish the effectiveness of the 577-nm pro-yellow laser in treating vascular skin disorders, Sarac and Onder [7] examined seventy-four patients who have been found to be suffering from such illnesses. The treatment course involved four weeks spacing intervals between sessions with pro-yellow laser. Progress was observed using pre and post session's photographs. Results showed significant progress in many vascular skin problems including rosacea, venous lake, scrotal angiokeratoma, port-wine stain, face telangiectasia, and cherry angioma conditions. The findings show a remarkable rate of success in the cases being investigated meaning that 577-nm pro yellow laser is an almost harmless and successful healing option against vascular skin lesions.

Table 1: Summary of Laser Systems for Cutaneous Vascular Diseases and Pro-Yellow Laser Innovation: Wavelengths, Chromophores, Applications, and References.

Laser Systems	Wavelength	Main Chromophores Targeted	Conditions Treated	Ref.
Nd:YAG lasers	1064 nm	Oxyhemoglobin, Deoxyhemoglobin	Cutaneous vascular diseases	Pioneered by Goldman et al. in the 1960s [2], still widely used [3].
KTP lasers	532 nm	Oxyhemoglobin	Cutaneous vascular diseases	Developed as part of innovative work in the 1960s [2].
Intense Pulsed Light (IPL)	Various	Oxyhemoglobin, Deoxyhemoglobin	Cutaneous vascular diseases	Commonly used for various dermatological conditions [3].
Alexandrite lasers	755 nm	Oxyhemoglobin	Cutaneous vascular diseases	Widely used for hair removal and vascular lesions [3].

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Pulsed Dye Lasers	585/595 nm	Oxyhemoglobin	Vascular lesions, e.g., port-wine stains	Effective in treating various vascular skin conditions [3].
Diode lasers	800–900 nm	Oxyhemoglobin	Dermatological conditions, hair removal	Versatile laser systems used for multiple applications [3].
Pro-Yellow Laser	577 nm	Oxyhemoglobin, Deoxyhemoglobin	Vascular skin lesions, e.g., rosacea, venous lake	Recent innovation, emerging as a potentially effective therapy option [4,5].

Research Problem:

The prevalence of vascular skin disorders, characterized by visible blood vessels and discoloration, presents a significant cosmetic concern for individuals worldwide. While various treatment modalities exist, there is a need to evaluate the efficacy of pro-yellow laser therapy in managing these conditions comprehensively.

Research Objectives:

1. Assess the effectiveness of pro-yellow laser treatment in reducing the affected area of vascular skin disorders.
2. Evaluate the improvement in skin coloration following pro-yellow laser therapy.
3. Determine the impact of pro-yellow laser treatment on the uniformity of skin color distribution in individuals with vascular skin disorders.
4. Investigate the safety profile and potential adverse effects associated with pro-yellow laser therapy for vascular skin disorders.
5. Compare the outcomes of pro-yellow laser treatment with conventional treatment modalities, such as topical creams or other laser therapies, in terms of efficacy and patient satisfaction.
6. Explore the long-term durability of results achieved with pro-yellow laser therapy for vascular skin disorders.

Theoretical background

1. Pro-yellow laser

This explains why Pro Yellow Laser is specifically designed to absorb certain substances as depicted on the laser absorption graph. This is why 577 nm yellow lasers are usually favored for the absorption of both melanin, which causes pigmentation, and oxyhemoglobin in blood vessels. In addition to this, such two substances also treat other conditions like pigmentation problems, facial veins, rosacea and acne [8].

Innovative devices are known for their ability to cure a variety of skin problems one of them being the

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Pro Yellow Laser. These skin rejuvenating lasers have several unique characteristics about them. They emit light at various wavelengths and can be pulsed according to different times for selective treatment of individual skin issues [10].

The strength of Pro Yellow Laser and related instruments comes from its capacity to take use of different wavelengths that contribute to the colors seen in the visible light spectrum. Furthermore, the flexibility to change the pulse lengths for every wavelength enables a focused strategy to treat unique skin issues that each person faces. Furthermore, this complex interaction of lights enables doctors to accurately treat a variety of skin conditions [11].

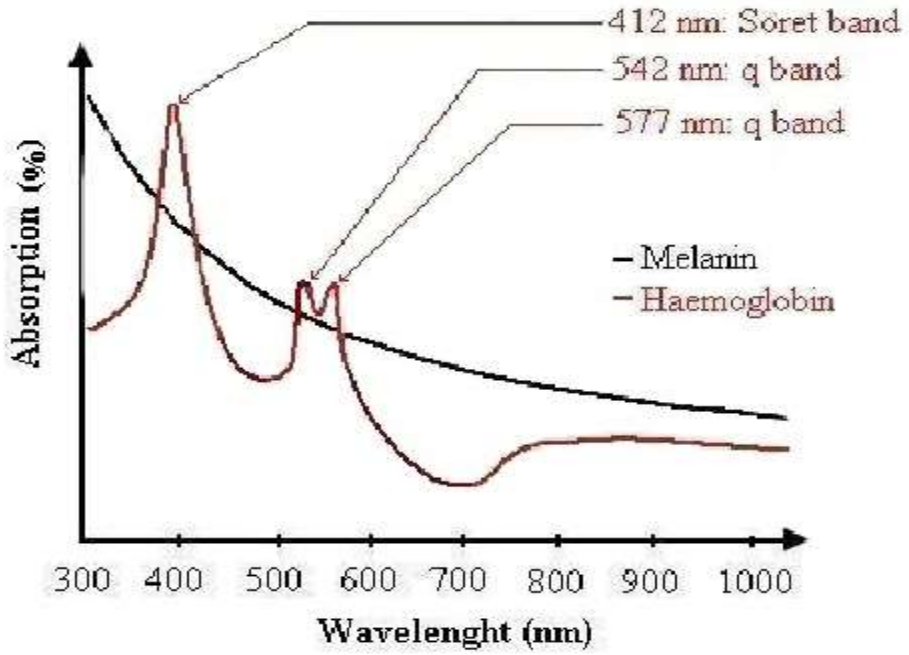

Figure 1: Melanin and hemoglobin absorption according on wavelength [11].

The Pro Yellow Laser, which has a wavelength of 577 nm that is not used by any other laser on the market, definitely steals the show. It distinguishes itself from other lasers such as Dual Yellow or Combination Laser that normally utilize a mixture of 532nm (green light) and 577nm (pure yellow light). In previous years, lasers with a wavelength of 532 nm were in demand for treating pigmented lesions and vascular disorders. Nevertheless, their ability to penetrate deeper into the skin proved problematic, particularly for individuals with darker complexions [12].

Introducing the Pro Yellow Laser, a true pioneer in the field. This groundbreaking laser sets itself apart as the very first of its kind, boasting a wavelength of 577nm that is solely focused on skin rejuvenation. Its importance lies in its exceptional ability to target blood vessels, with an astounding absorption rate that surpasses the standard green wavelength (532nm) by an impressive 40%.

Choosing Pro Yellow Laser yields a spectrum of benefits over conventional options, creating the advantages of Pro Yellow Laser:

1. Pro Yellow Laser for More Comfort and Faster Recovery: When Use Pro Yellow Laser Near Perfectly Targets Blood Vessels, The Result Is Greater Patient Comfort and Reduced Treatment Discomfort. Also, Less Time Taken to Recover Post-Treatment Due to Its Effectiveness.

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2. Minimizing Side Effects: In Addition, With the Use of Pro Yellow Laser, It's Possible to Reduce Side Effects related to blisters, burns or PIH (Post-Inflammatory Hyperpigmentation). This Makes Treatments Safer and More Reliable.
3. It Works for All Skin Types: Moreover, Pro Yellow Laser Stands Out Because It Can Be Safely Used on Either Vascular or Pigmented Lesions Regardless of The Patients' Skin Color Even Those with Darker Pigmentation. This Represents a Major Leap Forward in the Field of Treatment Options Given That 532nm Lasers Are Limited in Their Application on Darker Skins.

The Pro Yellow Laser is a deeply complex thing, which the exploration of science's depths brings to light. With a wavelength of 577nm, this laser, which is considered by many to be on the cutting edge of technology, is highly effective in dermatology. It rejuvenates skin with unprecedented efficacy due to its delicate balance between these characteristics that it possesses as well as its ability to penetrate tissues and vascular lesions with the utmost precision [13].

Figure 2: Before and after therapy for facial erythema [13].

Blood vessel targeting with precision: At 577nm Pro Yellow Laser specifically goes to blood vessels excellently. Consequently, it allows clinicians to be able to treat vascular lesions precisely resulting in better outcomes and less damage around the area [5].

Power Optimization: When used on patients, less energy is consumed by the Pro Yellow laser as it is absorbed by blood vessels at a rate of 40% higher than normal. It improves patient comfort while still maintaining high power efficiency levels of the machine. The laser is eco-friendly, requiring little power but producing great results thus saving patients from any dangers or side effects related to such procedures [1].

Enhanced Safety Features: The risk of adverse skin rejuvenation procedure profiles has been

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significantly lowered by the Pro Yellow Laser which guarantees minimal chances of developing side effects. With those fewer complications occur in individuals who have undergone laser treatments hence making it easier and safer for this population group [3].

Acceptance for all skin types: A game changer is the potential of Pro Yellow Laser in effectively treating vascular & pigmented lesions that affect all skin types. Traditional 532nm lasers were limited to black skinned people because they failed to reach needed depths. This deficiency is overcome by Pro Yellow Laser that creates a universal solution for different skin tones and concerns [8].

Patient-Centric Approach: Technical characteristics aside, Pro Yellow Laser can be considered as having its direction towards a patient-centered dermatologic approach. A more comfortable experience during treatment, less downtime, and lower risks contribute positively to patient satisfaction in general. It also encourages people with various fears about adverse events to think of it as well as fosters an increase in consumer demand [9].

2. Rosacea disorder

Rosacea is a chronic and inflammatory ailment characterized by various facial skin manifestations, including flushing, persistent redness, papules/pustules, telangiectasia, and phymatous alterations [14]. Itching, burning, or stinging are common side effects of dermatitis in individuals. Despite considerable research, it is still impossible to fully understand the physiology and pathology of rosacea. However, it is thought that a number of factors, including immune function, Demodex infection, and ultraviolet radiation exposure, contributed to its development [15]. Erythematotelangiectatic, papulopustular, phymatous, and ocular subtypes were identified in the 2002 classification of dermatitis. A phenotype-based method of treatment and classification was suggested in 2017. Both phymatous changes and fixed centrofacial erythema are regarded as separate rosacea medical criteria [16-17].

3. Specific Types of Rosacea

3.1. Ocular Rosacea

According to one research, more than half of those with rosacea have ocular involvement. A interdisciplinary investigation discovered that eyelid cleanliness and systemic tetracycline therapy were the most effective ways to treat retinal rosacea. Oral omega-3 fatty acids, ciclosporin ophthalmic emulsion, and doxycycline should be considered for the treatment of ocular rosacea. Vazirnia et al. [18] discovered that applying IPL to the periocular face skin can relieve dry eye symptoms in rosacea patients. They also underlined the significance of properly using eye shields to provide optimal eye protection. Another research discovered that three individuals with severe ocular rosacea responded well to an enhanced water-soluble silver (I) complex of metronidazole, which improved both objective and subjective tear film characteristics, as well as uncorrected visual acuity test results.

Donmez et al. [19] gave a thorough analysis of the clinical characteristics identified in a group of 16 juvenile patients diagnosed with ocular acne rosacea. The authors proposed a flexible therapy plan that included warm compresses, eye cleaning, preservative-free artificial tears, topical antibiotics and steroids, topical cyclosporine and oral doxycycline, azithromycin suspension, and erythrin suspension. Early identification and care are critical in children who demonstrate retinal irritation, meibomian gland

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illness, recurring chalazia, and long-lasting peripheral corneal infiltrates, even in the absence of cutaneous signs.

3.2. Phymatous Rosacea

The 2002 categorization of phymatous dermatitis, which was published by the National Rosacea Society, was based on the Expert Committee's definition of the species. The head, also referred to as rhinophyma, is the main location of phymatous dermatitis occurrence [20]. One of the distinguishing features for dermatitis diagnosis was identified in 2017 as phymatous changes. The method of managing phyma should depend on whether it is inflamed or not, according to the most recent update on rosacea treatment provided by the international ROSACEA COnsensus (ROSCO) panel. Oral doxycycline and isotretinoin are advised for swollen or active phyma, while physical modalities are suggested for fibrotic or non-inflaming patients. Because CO2 laser ablation was effective, dependable, practical, and predictable in a rhinophyma individual, Graves and colleagues used it [20].

3.3. Rosacea Fulminans

Rosacea fulminans, formerly referred to as pyoderma faciale or rostatea conglobate, is an uncommon disorder marked by the appearance of inflammatory papules, pustules, nodules, and cysts on the face. Rosacea fulminans and inflammatory bowel disease, as well as pregnancy, may be linked. The authors of an extensive analysis regarding the diagnosis and treatment of Rosacea fulminans have put forth a recommendation for systemic treatment involving the use of corticosteroids and/or isotretinoin. This particular course of treatment has the potential to alleviate symptoms and minimize the occurrence of scarring [21].

3.4. Granulomatous Rosacea

The Nationally Recognized Expert Committee on the Classification and Staging of Rosacea identified granulomatous dermatitis as a subspecies of the plant in 2002. Granulomatous rosacea was not mentioned in a more current classification scheme, though. This specific problem frequently develops over time and presents management challenges. Situation reports and case series have been the only papers on the treatment of granulomatous rosacea. Recent case reports have shown that oral doxycycline, dental metronidazole, topical brimonidine, chromophore gel-assisted phototherapy, and oral dapsone have all been successfully used to treat this condition [22].

3.5. Skin Care and Cosmetic Treatments

Patients with rosacea should take a mild approach to their skincare regimen, stressing moderation in washing and moisturizing, as well as the application of sunscreens. This is related to the reduced function of the skin's outermost layer, termed as the epidermal barrier, as well as the sensitive and highly irritated aspect of face skin in people with rosacea. Recent research of 999 instances of rosacea and 1010 control participants discovered a favorable link between the incidence of rosacea and a frequent pattern of washing [23], as well as intensive usage of cleansers. It is important to note that rosacea predominantly affects the face and has a waxing and waning pattern, which has a detrimental impact on

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both emotional health and quality of life. Rosacea patients should be educated by dermatologists on the peculiarities of disease, avoidance of triggers and relevance of skincare and lifestyle changes.
For instance, in 2018, one guideline was released by Society for Dermopharmacy which focused on dermocosmetics used in people with rosacea [24]. Therefore, it is important to determine efficacy and tolerance of these cosmetic products. The documentation of these products should be accessible to professionals in the field of dermatology and pharmacology. Guertler and colleagues conducted a study to evaluate the efficacy and safety of micellar water, cream, and serum on 50 Caucasian patients with rosacea. The results showed a significant decrease in facial redness and symptoms associated with rosacea. Baldwin and colleagues also conducted research to assess the effectiveness and tolerability of a tinted daily SPF-30 facial moisturizer on individuals with mild to moderate rosacea and persistent redness. The study involved 33 female participants, and it was reported that the moisturizer improved the appearance of the skin for those with rosacea.

3.6. Topical Therapies

With a recent systematic review of rosacea interventions through a phenotypical approach, topical brimonidine and topical oxymetazoline were suggested as a temporary treatment for persistent erythema [25]. Besides, topical azelaic acid, topical ivermectin, topical metronidazole and topical minocycline were recommended for the management of papules/pustules. In another systematic review and meta-analysis conducted by the author, it was found that topical ivermectin is the most effective among therapies for papulopustular rosacea; in addition to this, it brings significant psychological benefits to those patients who suffer from this condition. Importantly this product can be applied on almost clear skin with mild or no papulopustular rosacea and on skin with moderate or severe papulopustular rosacea. Firstly, the Minocycline foam is a new medication used for managing severe to moderate acne vulgaris [26]. The efficacy and safety of minocycline foam in the treatment of moderate to severe papulopustular rosacea have been established via two randomized clinical trials (751 patients with 771 respectively) [27]. An additional benefit of using 3% topical minocycline gel over vehicle in papulopustular rosacea patients was revealed by a12-week, prospective, double-blinded study involving 270 people. A higher percentage of patients using minocycline gel showed good results as assessed based on Investigator's Global Assessment. Rosacea clearly links with demodex infestation [29]. Higher levels of Demodex mites among individuals suffering from rosacea and papulopustules [34]. A retrospective study evaluating the effects of topical benzyl benzoate (+crotamiton) treatment on Demodex mite levels and clinical symptoms of rosacea and demodicosis enrolled 394 participants out there: those who had the disease (n=117) versus those who didn’t have it (n=277). Patients’ groups did not differ markedly [30]. It has been shown that this therapy was effective in 46% of patients and curative in 20% but the higher dosage regimens have shown to be better than the lower ones. In a similar study involving 344 patients, application of benzyl benzoate (as well as crotamiton) gel resulted in restoration of Demodex mite counts, and over 80% of patients who complied with the regimen reported improved symptoms; however, it did not work effectively on non-compliant ones and there were no quick improvements [31]. Increased dosage was linked to increased adherence as well as faster reaction times showing some advantages for people suffering from rosacea and demodicosis.

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Tranexamic acid is a common treatment for melasma, at the dermal or structural level. In recent times, research suggests increased use of tranexamic acid in rosacea care. Trasexamic acids has potential to alleviate symptoms of rosacea patients due to its ability to control angiogenesis and immune response. In 2013, Kim et al conducted a study on six Asian women affected by irritant contact dermatitis or papulopustular rosacea. These patients were treated with tranexamic acid solution soaking [32]. The therapeutic effect was proven by reduced erythema quadrant scores in every case. Moreover, there were considerable drops in itching, flushing and burning visual analogue scale (VAS) scores while no significant adverse events were reported [32]. Other investigations involving 20 patients [33] and one patient respectively have also employed topical tranexamic acid for treating erythematotelangiectatic rosacea[33], whereby both studies indicated positive therapeutic effects and good safety profiles.

3.7. Oral Therapies

The approach for moderate to severe papulopustular rosacea can be either systemic or combination therapy. The USFDA has given the oral amoxicillin capsules that have modified release the green light to be used as a treatment for inflammatory papules and pustule related to rosacea [34]. The updated systematic review on rosacea interventions recommends doxycycline 40 mg modified release (supported by moderate-to-high-certainty evidence), isotretinoin (supported by medium- to high-confidence evidence) and minocyclin as potential treatments for reducing papules/pustule enlargement. Oral β-blockers may have an effect in persistent erythema/flushing; these agents counteract sympathetic nerve stimulation and circulating catecholamines at β-adrenoceptors [35]. A systematic review conducted by Logger et al., which consisted of nine studies, concluded that oral nonselective β-blockers, especially carvedilol and propranolol, could serve as a feasible treatment option for rosacea-related facial flushing and erythema.

3.8. Laser- and Light-Based Therapies

In the recent systematic review on rosacea interventions, which was published in 2012, laser therapy and intense pulsed light (IPL) treatment were recommended for controlling erythema and mainly telangiectasia. No difference in pigmentation or erythema index was observed when comparing short pulse ILP therapy versus pulsed dye laser therapy at similar energy levels for treatment of rosacea [25]. Also, Zhang et al found that several sequential light/laser sources may be used to target nasal rhinophyma among other conditions like erythema/telangiectasia and papules/pustulas in a study of 807 patients with various forms of the disease [49]. Moreover, removing cosmetic leprosy and facial telangia5 as well as treating erythematotelangiectatic rosacea using a 577 nm pro-yellow laser has proven effective and safe according to a study with 40 patients3 [5].

The previous case had a patient who had persistent granulomatous rosacea who underwent δ-aminolaevulinic acid-photodynamic therapy (ALA-PDT) [37]. Yet, it should be taken into account that there were six sessions.

There have been two studies conducted which have indicated that ALA-PDT is a reliable and safe approach for managing erythematotelangiectatic or papulopustular rosacea. However, it should be noted that the sample size in these studies was relatively small, with only 17 and 20 patients, respectively.

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Besides, it is important to choose appropriate parameters when examining laser- and light-based therapies because they can cause a rise in photodynamic therapy which may result in rosacea flares at higher levels [38].

Laser- and light-based remedies have been studied recently along with other treatments. It has been suggested by results of a phase 4, multicenter, interventional, open label study involving 46 patients that oxymetazoline could provide some benefits when used together with energy based therapy to treat moderate or severe persistent cosmetic erythema associated with rosacea. In another retrospective study with thirty-one cases, erythema and telangiectasias could be reduced effectively as well as safely using pulsed dye laser (PDL) and 1.0% oxymetazoline cream [39]. An open-label study on twenty-one subjects also assessed effectiveness and acceptability of topical skin treatment combined with sun protection during IPL therapy [40]. Though not statistically significant this improvement showed decrease in investigator-rated erythema (IRE) following monotherapy using topical skin care regimen (TSCR). However, after that period of 18 months, 80% of the subjects reported being satisfied or very satisfied with the TSCR and all concurred it improved their skin redness.

3.9. Injection Therapies

Two of the injection therapies that still remain effective in treating rosacea are botulinum toxin and interleukin (IL)-17 inhibitors. In a randomised, double-blinded, placebo-controlled, split-face research study [41], 24 participants were assigned to either treatment or placebo groups. After that, every ear of the participant received an intradermal injection; one with regular salt and other with botulinum toxin. There was another study where 20 patients with rosacea were given a combined therapy that involved intradermal botulinum toxin and pulsed dye laser [42]. The combination therapy exhibited a synergistic effect that had high efficiency rates, gave rise to high patient satisfaction scores as well as few adverse effects.

Results and discussion

The results of the yellow-laser treatment for face skin distortion present a promising outcome, reflecting a notable improvement in the condition. Prior to the treatment of patient #1 (Fig. 3), analysis via the RGB histogram revealed a substantial presence of affected skin dots, with a count of 9944. This indicates a significant area of concern in terms of skin distortion. The mean RGB value of these affected areas stood at 88.823, suggesting a deviation from the expected or healthy skin coloration, while the standard deviation of 62.123 indicated a certain level of variability in color distribution across these affected regions. However, post-treatment analysis reveals a positive shift. The count of affected skin dots decreased to 7752, indicating a considerable reduction in the affected area, which implies successful targeting and treatment of a substantial portion of the initial skin distortion. Moreover, the mean RGB value increased to 108.448, indicating a move towards a more normal or healthier skin coloration post-treatment. This increase suggests a significant improvement in the overall appearance and color balance of the treated skin areas. Interestingly, the standard deviation of RGB values post-treatment remained relatively stable at 62.243, implying that while the treatment addressed the overall discoloration and improved the mean RGB value, it may not have significantly altered the variation in color distribution across the affected areas. In essence, these results signify the efficacy of the yellow-

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laser treatment in reducing the affected area and improving the coloration of the skin, albeit with a relatively minor impact on the variability in color distribution.

Figure 3: Patient #1: A female patient before and after laser.

In patient #2 (Fig. 4), the outcomes of the yellow-laser treatment for face skin distortion demonstrate a significant improvement in the condition, with notable changes observed in various parameters. Prior to the treatment, analysis through the RGB histogram revealed 1980 affected skin dots, indicative of the extent of the skin distortion concern. The mean RGB value stood at 136.846, suggesting a departure from the expected or healthy skin coloration, while the standard deviation of 14.316 indicated a certain level of variability in color distribution across these affected regions. However, following the laser treatment, there was a substantial positive shift. The count of affected skin dots decreased to 1120, representing a significant reduction in the affected area and indicating successful targeting and treatment of a substantial portion of the initial skin distortion. In addition, the mean RGB value dropped somewhat to 131.550 after treatment, suggesting a shift in the direction of healthier or more typical skin tone. This decrease shows that the treated skin regions' overall look and color balance have improved. Significantly, after treatment, the RGB values' standard deviation dropped to 6.675, indicating a decrease in the variability of the color distribution across the impacted regions. This decline further improves the treatment's visual result by indicating a more constant and uniform hue. Overall, these findings demonstrate how well the yellow-laser therapy worked to minimize variability in color distribution, minimize the afflicted region, and improve skin coloration—all of which helped to resolve the skin deformation on the face.

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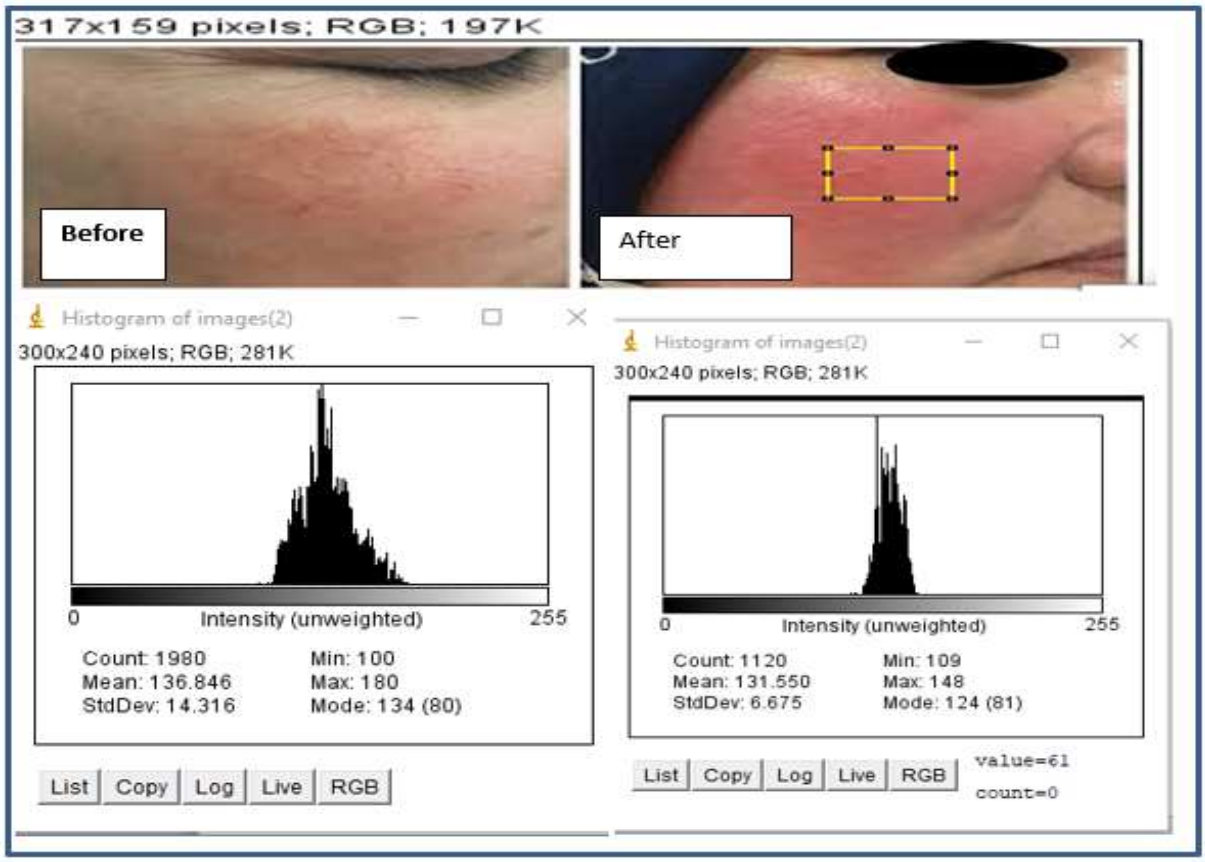

Figure 4: Patient #2: A female patient before and after laser.

Patient #3's facial skin distortion after receiving yellow-laser therapy (Fig. 5) shows a considerable improvement in the condition with discernible improvements in numerous important parameters. The study of the RGB histogram performed before the therapy showed a significant presence of damaged skin dots, with a count of 123020. This significant figure demonstrated the severity of the skin deformity problem in this specific patient. Prior to treatment, the average RGB value was 186.38, which deviated from the typical or healthy skin tone. The standard deviation, at 14.324, indicated some degree of variation in the color distribution among the impacted areas. After the laser treatment, there was a very noticeable improvement. A huge proportion of the original skin defect was identified and treated as demonstrated by a count of 115020 infected spots. This fall shows a significant decrease in the area involved. Also, mean RGB value reduced significantly to 166.728 after treatment, signifying great improvement towards normal or healthy skin tone. This decrease means that the overall appearance and color balance of these treated skin areas have been considerably improved. Furthermore, after treatment, the standard deviation of RGB values dropped to 12.580 showing decreased variability in colors across treated regions. The reduction is an indication of more uniform and even coloring which enhances this treatment's aesthetics effects making them more pleasing to look at among other things. As a whole, these results show how patient number three responded well to yellow-laser therapy which shrank affected section, improved skin colouring and diminished color distribution diversity.This made it possible for facial distortions on skins be curbed effectively thereby yielding appreciable achievements in this regard in particular.

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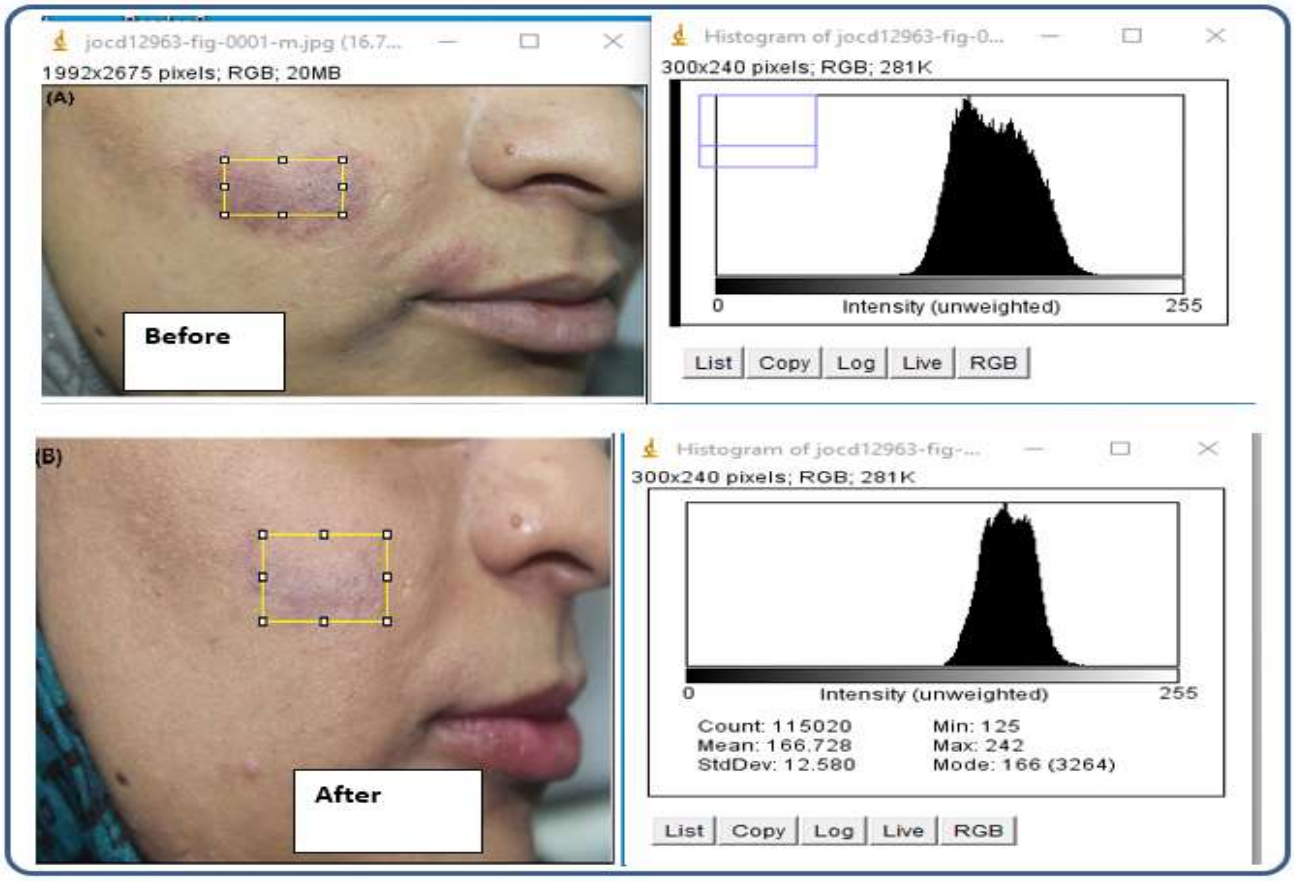

Figure 5: Patient #3: A female patient before and after laser.

Conclusion

The results of yellow–laser therapy for facial skin distortion in the presented cases summarize how successful this dermatologic ailment is treated. Several patients and conditions saw positive developments, which included a reduction in affected skin dots, a better mean RGB value approaching better healthy skin color and a decrease in standard deviation of RGB values indicating more uniform color distribution. These findings demonstrate that yellow-laser therapy can be effective in treating face skin distortion as it makes visible changes to its structure and texture. The overall trend suggests that even though individual responses may differ, yellow-laser therapy is showing promise for being an important dermatologist tool to handle this condition. Long term follow-up studies and additional research would provide greater insights into optimal approaches, patient selection criteria and maintenance programs to maximize the benefits of yellow-laser therapy on facial skin distortion. Therefore, considering the results demonstrated above, it is correct to argue that yellow-laser treatment represents a remarkable improvement when it comes to dermatological care since it offers individuals the possibility of improving their well-being as well as self-assurance levels.

References

[1]. Alinia, H., Cardwell, L. A., Tuchayi, S. M., Nadkarni, A., Bahrami, N., Richardson, I. M., ... & Feldman, S. R. (2018). Screening for depression in rosacea patients. Cutis, 102(1), 36-38.

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DOI 10.6084/m9.figshare.26310923
http://magellanes.com/

[2]. Goldman, L., Blaney, D. J., Kindel, D. J., & Franke, E. K. (1963). Effect of the laser beam on the skin. J Invest Dermatol, 40(121), 2.
[3]. Tanzi, E. L., Lupton, J. R., & Alster, T. S. (2003). Lasers in dermatology: four decades of progress. Journal of the American Academy of Dermatology, 49(1), 1-34.
[4]. Temiz, S. A., Ataseven, A., Dursun, R., Özer, İ., TemizI, S. A., AtasevenII, A., ... & ÖzerIV, İ. (2020). Successful treatment of poikiloderma of Civatte with a 577-nm pro-yellow laser. Journal of Cosmetic Dermatology, 2020;19(10):2769-2770.
[5]. Kapicioglu, Y., Sarac, G., & Cenk, H. (2019). Treatment of erythematotelangiectatic rosacea, facial erythema, and facial telangiectasia with a 577-nm pro-yellow laser: a case series. Lasers in medical science, 34, 93-98.
[6]. Mohamed, E. E. M., Mohamed Tawfik, K., & Hassan Ahmad, W. (2019). Successful treatment of facial vascular skin diseases with a 577-nm pro-yellow laser. Journal of cosmetic dermatology, 18(6), 1675-1679.
[7]. Aksoy Saraç, G., & Önder, M. (2021). Evaluation of the efficacy of pro-yellow laser in the management of vascular skin disorders. Journal of Cosmetic Dermatology, 21(3):1018-1022.
[8]. Kwon, Y. H., Lee, D. K., & Kwon, O. W. (2014). The short-term efficacy of subthreshold micropulse yellow (577-nm) laser photocoagulation for diabetic macular edema. Korean Journal of Ophthalmology, 28(5), 379-385.
[9]. Levinson, J. D., & Hubbard III, G. B. (2016). 577-nm yellow laser photocoagulation for Coats disease. Retina, 36(7), 1388-1394.
[10]. Mohamed, E. E. M., Mohamed Tawfik, K., & Hassan Ahmad, W. (2019). Successful treatment of facial vascular skin diseases with a 577-nm pro-yellow laser. Journal of cosmetic dermatology, 18(6), 1675-1679.
[11]. Prigent, S., Descombes, X., Zugaj, D., & Zerubia, J. (2010, June). Spectral analysis and unsupervised svm classification for skin hyper-pigmentation classification. In 2010 2nd Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (pp. 1-4).
[12]. Sarac, G., Kapicioglu, Y., & Cenk, H. (2022). A new treatment option for poikiloderma of Civatte: 577 nm pro-yellow laser. Journal of Cosmetic Dermatology, 21(1), 316-319.
[13]. Ataseven, A., Temiz, S. A., & Özer, İ. (2023). An Investigation of the Effectiveness of the 577-nm Pro-yellow Laser in Patients with Vascular Disorders. European Journal of Therapeutics, 29(1), 49-54.
[14]. Thapa, L., Xia, J., Guo, W., Usmani, H., Miller, D., & Lozeau, D. (2023). Rosacea and Its Association With Malignancy: Systematic Review. JMIR dermatology, 6(1), e47821.
[15]. Rainer, B. M., Kang, S., & Chien, A. L. (2017). Rosacea: Epidemiology, pathogenesis, and treatment. Dermato-endocrinology, 9(1), e1361574.
[16]. Wilkin, J., Dahl, M., Detmar, M., Drake, L., Feinstein, A., Odom, R., & Powell, F. (2002). Standard classification of rosacea: report of the National Rosacea Society Expert Committee on the Classification and Staging of Rosacea. Journal of the American Academy of Dermatology, 46(4), 584-587.
[17]. Gallo, R. L., Granstein, R. D., Kang, S., Mannis, M., Steinhoff, M., Tan, J., & Thiboutot, D. (2018). Standard classification and pathophysiology of rosacea: the 2017 update by the National Rosacea Society Expert Committee. Journal of the American Academy of Dermatology, 78(1), 148-155.

ISSN:1624-1940
DOI 10.6084/m9.figshare.26310923
http://magellanes.com/

[18]. Vazirnia, A., Wat, H., Danesh, M. J., & Anderson, R. R. (2020). Intense pulsed light for improving dry eye disease in rosacea. Journal of the American Academy of Dermatology, 83(2), e105.

[19]. Donmez, O., & Akova, Y. A. (2021). Pediatric ocular acne Rosacea: clinical features and long term follow-up of sixteen cases. Ocular Immunology and Inflammation, 29(1), 57-65.

[20]. Zhang, H., Tang, K., Wang, Y., Fang, R., & Sun, Q. (2021). Rosacea treatment: review and update. Dermatology and therapy, 11, 13-24.

[21]. Coutinho, J. C., Westphal, D. C., Lobato, L. C., Schettini, A. P. M., & Santos, M. (2016). Rosacea fulminans: unusual clinical presentation of rosacea. Anais Brasileiros de Dermatologia, 91, 151-153.

[22]. Buddenkotte, J., & Steinhoff, M. (2018). Recent advances in understanding and managing rosacea. F1000Research, 7.

[23]. Li, G., Wang, B., Zhao, Z., Shi, W., Jian, D., Xie, H., ... & Li, J. (2021). Excessive cleansing: an underestimating risk factor of rosacea in Chinese population. Archives of Dermatological Research, 313, 225-234.

[24]. Kresken, J., Kindl, U., Wigger-Alberti, W., Clanner-Engelshofen, B. M., & Reinholz, M. (2018). Dermocosmetics for use in rosacea: guideline of the society for dermopharmacy. Skin Pharmacology and Physiology, 31(3), 147-154.

[25]. Van Zuuren, E. J., Fedorowicz, Z., Tan, J., Van Der Linden, M. M. D., Arents, B. W. M., Carter, B., & Charland, L. (2019). Interventions for rosacea based on the phenotype approach: an updated systematic review including GRADE assessments. British Journal of Dermatology, 181(1), 65-79.

[26]. Shemer, A., Shiri, J., Mashiah, J., Farhi, R., & Gupta, A. K. (2016). Topical minocycline foam for moderate to severe acne vulgaris: Phase 2 randomized double-blind, vehicle-controlled study results. Journal of the American Academy of Dermatology, 74(6), 1251-1252.

[27]. Gold, L. S., Del Rosso, J. Q., Kircik, L., Bhatia, N. D., Hooper, D., Nahm, W. K., & Stuart, I. (2020). Minocycline 1.5% foam for the topical treatment of moderate to severe papulopustular rosacea: results of 2 phase 3, randomized, clinical trials. Journal of the American Academy of Dermatology, 82(5), 1166-1173.

[28]. Webster, G., Draelos, Z. D., Graber, E., Lee, M. S., Dhawan, S., Salman, M., & Magrath, G. N. (2020). A multicentre, randomized, double-masked, parallel group, vehicle-controlled phase IIb study to evaluate the safety and efficacy of 1% and 3% topical minocycline gel in patients with papulopustular rosacea. British Journal of Dermatology, 183(3), 471-479.

[29]. OLIVIER, C., ROBERT, P. D., DAIHUNG, D., URBÀ, G., CATALIN, M. P., HYWEL, W., ... & Cheng, H. (2010). Retrospective analysis of the association between Demodex infestation and rosacea. Archives of dermatology, 146(8), 896-902.

[30]. Forton, F. M. N., & De Maertelaer, V. (2020). Treatment of rosacea and demodicosis with benzyl benzoate: effects of different doses on Demodex density and clinical symptoms. Journal of the European Academy of Dermatology and Venereology, 34(2), 365-369.

[31]. Forton, F. M., & De Maertelaer, V. (2022). Effectiveness of benzyl benzoate treatment on clinical symptoms and Demodex density over time in patients with rosacea and demodicosis: a real life retrospective follow-up study comparing low-and high-dose regimens. Journal of Dermatological Treatment, 33(1), 456-465.

ISSN:1624-1940
DOI 10.6084/m9.figshare.26310923
http://magellanes.com/

[32]. Kim, M. S., Chang, S. E., Haw, S., Bak, H., Kim, Y. J., & Lee, M. W. (2013). Tranexamic acid solution soaking is an excellent approach for rosacea patients: a preliminary observation in six patients. The Journal of Dermatology, 40(1), 70-71.

[33]. Bageorgou, F., Vasalou, V., Tzanetakou, V., & Kontochristopoulos, G. (2019). The new therapeutic choice of tranexamic acid solution in treatment of erythematotelangiectatic rosacea. Journal of Cosmetic Dermatology, 18(2), 563-567.

[34]. Thiboutot, D., Anderson, R., Cook-Bolden, F., Draelos, Z., Gallo, R. L., Granstein, R. D., ... & Tan, J. (2020). Standard management options for rosacea: The 2019 update by the National Rosacea Society Expert Committee. Journal of the American Academy of Dermatology, 82(6), 1501-1510.

[35]. Chen, L., & Tsai, T. F. (2018). The role of β-blockers in dermatological treatment: a review. Journal of the European Academy of Dermatology and Venereology, 32(3), 363-371.

[36]. Kim, B. Y., Moon, H. R., & Ryu, H. J. (2019). Comparative efficacy of short-pulsed intense pulsed light and pulsed dye laser to treat rosacea. Journal of Cosmetic and Laser Therapy, 21(5), 291-296.

[37]. Anzengruber, F., Czernielewski, J., Conrad, C., Feldmeyer, L., Yawalkar, N., Häusermann, P., ... & Navarini, A. A. (2017). Swiss S1 guideline for the treatment of rosacea. Journal of the European Academy of Dermatology and Venereology, 31(11), 1775-1791.

[38]. Fan, L., Yin, R., Lan, T., & Hamblin, M. R. (2018). Photodynamic therapy for rosacea in Chinese patients. Photodiagnosis and photodynamic therapy, 24, 82-87.

[39]. Suggs, A. K., Macri, A., Richmond, H., Munavalli, G., & Friedman, P. M. (2020). Treatment of erythematotelangiectatic rosacea with pulsed-dye laser and oxymetazoline 1.0% cream: A retrospective study. Lasers in Surgery and Medicine, 52(1), 38-43.

[40]. Deaver Peterson, J., & Katz, T. M. (2019). Open-label study assessing the efficacy and tolerability of topical skin care and sun protection alone and in combination with intense pulsed light therapy. Journal of Cosmetic Dermatology, 18(6), 1758-1764.

[41]. Kim, M. J., Kim, J. H., Cheon, H. I., Hur, M. S., Han, S. H., Lee, Y. W., ... & Ahn, K. J. (2019). Assessment of skin physiology change and safety after intradermal injections with botulinum toxin: a randomized, double-blind, placebo-controlled, split-face pilot study in rosacea patients with facial erythema. Dermatologic Surgery, 45(9), 1155-1162.

[42]. Al-Niaimi, F., Glagoleva, E., & Araviiskaia, E. (2020). Pulsed dye laser followed by intradermal botulinum toxin type-A in the treatment of rosacea-associated erythema and flushing. Dermatologic Therapy, 33(6), e13976.