Treatment of rosacea with dual-band wavelength intense pulsed light in a single shot

Tratamento de rosácea com duas faixas de comprimento de onda de luz intensa pulsada num mesmo disparo

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ABSTRACT

Introduction: Rosacea is a chronic disease that usually manifests as flushing, persistent facial erythema, telangiectasia, papules and pustules. Intense Pulsed Light (IPL) is reported for treatment of vascular lesions of facial telangiectasias rosacea.

Objective: To assess clinical and dermoscopy improvement of facial erythema and flushing, and the clearing of vessels to dermoscopic after using IPL.

Methods: Nine patients were selected, with facial telangiectasic rosacea, aged between 36 and 59 years, with skin types I to III, without any treatment in the past six months. The treatment consisted in applications of the Intense Pulsed Light(IPL) with dual-band, 535-680 nm and 860-1200 nm, in one single shot. To favor the target hemoglobin, there is a greater protection for the skin. Three sessions were conducted within the interval of 1 month.

Results: After treatment, 87.5% of patients noticed reduction in flushing and telangiectasia. Adverse events were minimal and transient. To date no treatment was complete for telangiectasia rosacea.

Conclusions: This study demonstrated that treatment with IPL technology using "dual-band" is effective in obtaining a large (>75%) clinical improvement in 50% of patients and moderate improvement (51% to 75%) in 28.6% of patients.

Keywords: rosacea; intense pulsed light therapy; telangiectasia, erythema

RESUMO

Introdução: A rosácea é doença crônica que geralmente se manifesta como flushing, eritema facial persistente, telangiectasias, pápulas e pústulas. A luz intensa pulsada é usada para tratamento de lesões vasculares de rosácea telangiectásica facial.

Objetivos: Avaliar a melhora clínica e dermatoscópica do eritema facial e rubor, e o clareamento dos vasos à dermatoscopia após o uso de luz intensa pulsada.

Métodos: Foram selecionados nove pacientes, com rosácea telangiectásica facial, com idade entre 36 e 59 anos, e fototipo I a III, sem qualquer tipo de tratamento nos últimos seis meses. O tratamento consiste em aplicações da luz intensa pulsada com dual-band, 535-680nm e 860-1200nm, no mesmo disparo. Por favorecer o alvo da hemoglobina, há maior proteção para a epiderme. Foram realizadas três sessões a intervalos de um mês.

Resultados: Após o tratamento, 87,5% dos pacientes notaram redução de flushing e telangiectasia, e os médicos avaliadores, grande (> 75%) melhora clínica em 50% dos pacientes e melhora moderada (51%-75%) em 28,6%. Os efeitos adversos foram mínimos e transitórios.

Conclusões: Até o momento nenhum tratamento mostrou-se completo para a rosácea telangiectásica. Este estudo demonstrou que o tratamento com luz intensa pulsada utilizando a tecnologia dual band é eficaz no tratamento da rosácea.

Palavras-chave: rosácea; terapia de luz pulsada intensa; telangiectasia, eritema
INTRODUCTION

Rosacea is a chronic disease that usually manifests as flushing, persistent facial erythema, telangiectasia, papules and pustules. Intense Pulsed Light (IPL) is described for the treatment of vascular lesions of facial telangiectasic rosacea.\(^1\)

Intense Pulsed Light is a polychromatic, non-coherent light of broad electromagnetic spectrum, capable of emitting wavelengths between 390nm and 1,200nm.\(^2\)

Its principle is based on the absorption of photons by endogenous or exogenous chromophores within the skin. This energy transfer to these target-chromophores generates heat and subsequent destruction of specific structures of the skin through a process called selective photothermolysis. The wavelength should be selected depending on the target-chromophore's peak absorption and the pulse's duration, which should be shorter than the thermal relaxation time. This limits the diffusion of heat and minimizes the damage to the surrounding structures.\(^3\)

The possibility of using different combinations of wavelength, pulse duration, time lapse between shots and fluences allows the use of IPL devices to treat various dermatological conditions, including rosacea.\(^2\)

Rosacea is a chronic dermatosis of unknown etiology characterized by erythema, telangiectasia, papules and pustules.\(^4,5\)

In the present study, the authors used the Omnimax\(^\circledR\) platform (Sharp Light, Israel), which contains the IPL tip with double absorption band for hemoglobin (535-680 and 860-1,200nm).

METHODS

Nine volunteers were selected (8 women and 1 man, aged between 36 and 59 years, with Fitzpatrick skin phototypes I-III). The following inclusion criteria were established: patients with telangiectasic rosacea (erythema, flushing, telangiectasia) without ambulatorial dermatological treatment for the previous six months. Exclusion criteria were: immunosuppression, neurological or immunological diseases, pregnancy, any local sign of infection or inflammatory skin disease, previous formation of hypertrophic scars or keloids, current use of aspirin or nonsteroidal anti-inflammatory, exposure to UV radiation in the previous six months. Exclusion criteria were: immunosuppression, neurological or immunological diseases, pregnancy, any local sign of infection or inflammatory skin disease, previous formation of hypertrophic scars or keloids, current use of aspirin or nonsteroidal anti-inflammatory, exposure to UV radiation in the previous six months. Exclusion criteria were: immunosuppression, neurological or immunological diseases, pregnancy, any local sign of infection or inflammatory skin disease, previous formation of hypertrophic scars or keloids, current use of aspirin or nonsteroidal anti-inflammatory, exposure to UV radiation in the previous six months.

The study patients answered the questionnaire using a scale based on the guidelines of the National Rosacea Society Expert Committee,\(^6\) in which a comparative assessment of the treatment's efficacy was carried out for the following variables: texture, burning sensation, telangiectasia, flushing and erythema.

The symptoms with most obvious improvements were erythema and telangiectasia, for which seven of the patients reported significant improvement. Opinions about the skin's texture and flushing were mostly positive, indicating there had been mild,
moderate or intense improvement of the picture. *Burning sensation* was reported by 50% of patients (Graph 1).

Two physicians also individually evaluated the results through before and after the treatment photographs. The following scale was used: <25%, 25 to 50%, 51 to 75% and >75% improvement. In this analysis, the results were evaluated considering the general appearance of the patient, without differentiating the signals.

Of the analyzed cases, 50% were classified as having had more than 75% of improvement in the overall clinical picture, followed by the second highest improvement rating (51-75%), which has been achieved by 28.6% of patients who underwent treatment with IPL. Only 3 of the 14 analyzed photographs received ratings lower than 50% of clinical improvement (Figures 1 to 4) (Graph 2).

The results of only 8 patients were analyzed, as there was one desistance after the initial selection, due to pain and discomfort during the procedure.

**DISCUSSION**

A proven effective and safe treatment option for rosacea is the use of light-based technology. The present study was based on the use of phototherapy with IPL operated within two light band ranges for facial rosacea in one single shot.
Intense pulsed light technology was designed to treat vascular and pigmented lesions, however it has other applications, such as hair removal and photorejuvenation. The fact that it can generate single or multiple synchronized pulses, coupled with the possibility of varying the duration of these shots, makes it a very versatile tool. \(^5\)

In the literature, Mark et al. \(^7\) demonstrated reductions of 29% in telangiectasia and 21% in erythema after 5 sessions of IPL using a 515nm filter and single pulses with duration of 3ms. Similarly to what was done in the present study, Taub et al. performed a trial with approximately 500 patients, who underwent sessions of IPL or laser associated with bipolar radiofrequency. Based on medical evaluations, one month after the third sessions the patients had their erythema reduced to 1.21 from 2.38, and telangiectasia to 0.86 from 1.64 (maximum rating = 3). Moreover, they obtained an evident improvement in the skin’s texture. \(^8\) As compared to that trial, the present study yielded similar outcomes, with a significant improvement in symptoms of erythema, telangiectasia and in the skin’s texture after the sessions.

With a smaller sample (34 patients), another article has demonstrated the efficacy of IPL. After 4 sessions, the erythema and severity scores, as well as the photographic evaluation improved significantly, with the results being maintained in a reassessment carried out six months after, with minimal and transient side effects. \(^5\)

In another study, the analysis of 60 patients bearers of telangiectasia associated with rosacea who underwent treatment with IPL using a wide wavelength spectrum (ranging from 515 to 1,200nm) and different filters (515, 550, 570 and 590nm) during a period of approximately 2 years, it was possible to observe improvement in 77.8% of the lesions. \(^9\)

**CONCLUSIONS**

The present evaluation showed that the IPL treatment was effective in obtaining intense improvement (>75%) in the clinical aspect of 50% of patients, and moderate improvement (51-75%) in 28.6% of patients, with minimal and transient side effects.

Treatment with IPL increases the amount of superficial collagen and elastic fibers in the dermis. This is due to the selective absorption of light by the water contents in the tissues, increasing the conduction of heat around the collagen, therefore increasing its production. Furthermore, there is increased production of fibroblasts by the photothermal effect. This mechanism explains the better results reported by patients younger than 40, as evidenced by Lim et al. \(^1\)

By using this laser type, it is possible to destroy abnormal blood vessels, reduce the inflammation and the number of active sebaceous glands, in addition to block the altered keratinization process. All these effects contribute to the overall improvement of the rosacea’s clinical picture. \(^8\)
REFERENCES


