



LASER VÀ ÁNH SÁNG TRONG ĐIỀU TRỊ HỒNG BAN SAU MỤN

ThS.BS. Nguyễn Duy Quân

Khoa Thẩm mỹ da – Bệnh viện Da liễu TPHCM

NỘI DUNG

1. Sinh bệnh học

2. Các phương pháp điều trị

**3. LASER/ánh sáng trong điều trị hồng
ban sau mụn**

THUẬT NGỮ

Table I. Gaps in and recommendations for identifying and classifying acne sequelae and their impact on patients, based on a consensus

Gaps

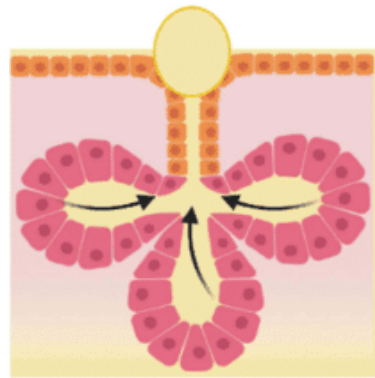
- The term “postinflammatory” when describing hyperpigmentation in acne is a misnomer (11/12)
- The term “postinflammatory” when describing erythema in acne is a misnomer (12/12)
- Scarring is the single acne sequela that has the greatest impact on patients’ quality of life (11/13)
- If present, macular hyperpigmentation (10/12) in patients with darker skin phototypes (Fitzpatrick scale IV-VI), macular erythema (10/11), and scarring regardless of skin phototype (13/13) are some acne sequelae that have the greatest impact on patients’ quality of life
- The following are common (>50%) concerns reported by patients specifically with regard to acne sequelae: long-term or permanent duration (13/13); appearance (13/13); availability of options to treat them (11/13); and unmet expectations (eg, anticipated completely “perfect” skin; 10/13)

Recommendations

- The prefix “acne-induced” should be used to describe acne sequelae to differentiate the cause from other dermatologic conditions (13/13)
 - Acne-induced scars are volumetric changes (hypertrophic or atrophic) that occur on the skin as a result of primary acne lesions and may be permanent or may resolve over time or with treatment (12/13)
 - Residual dark marks or spots that occur on the skin as a result of acne lesions are more appropriately described as “macular hyperpigmentation” than “postinflammatory hyperpigmentation” (13/13)
 - Residual redness that occurs on the skin as a result of acne lesions is more appropriately described as “macular erythema” than “postinflammatory erythema” (12/12)
 - Macular erythema is a common sequela of acne (11/12)
 - Severe, inflammatory acne is a particular risk factor for acne-induced macular erythema (11/12)
 - Acne-induced macular erythema is typically more visible in patients with lighter skin phototypes (Fitzpatrick scale I-III) (11/12)
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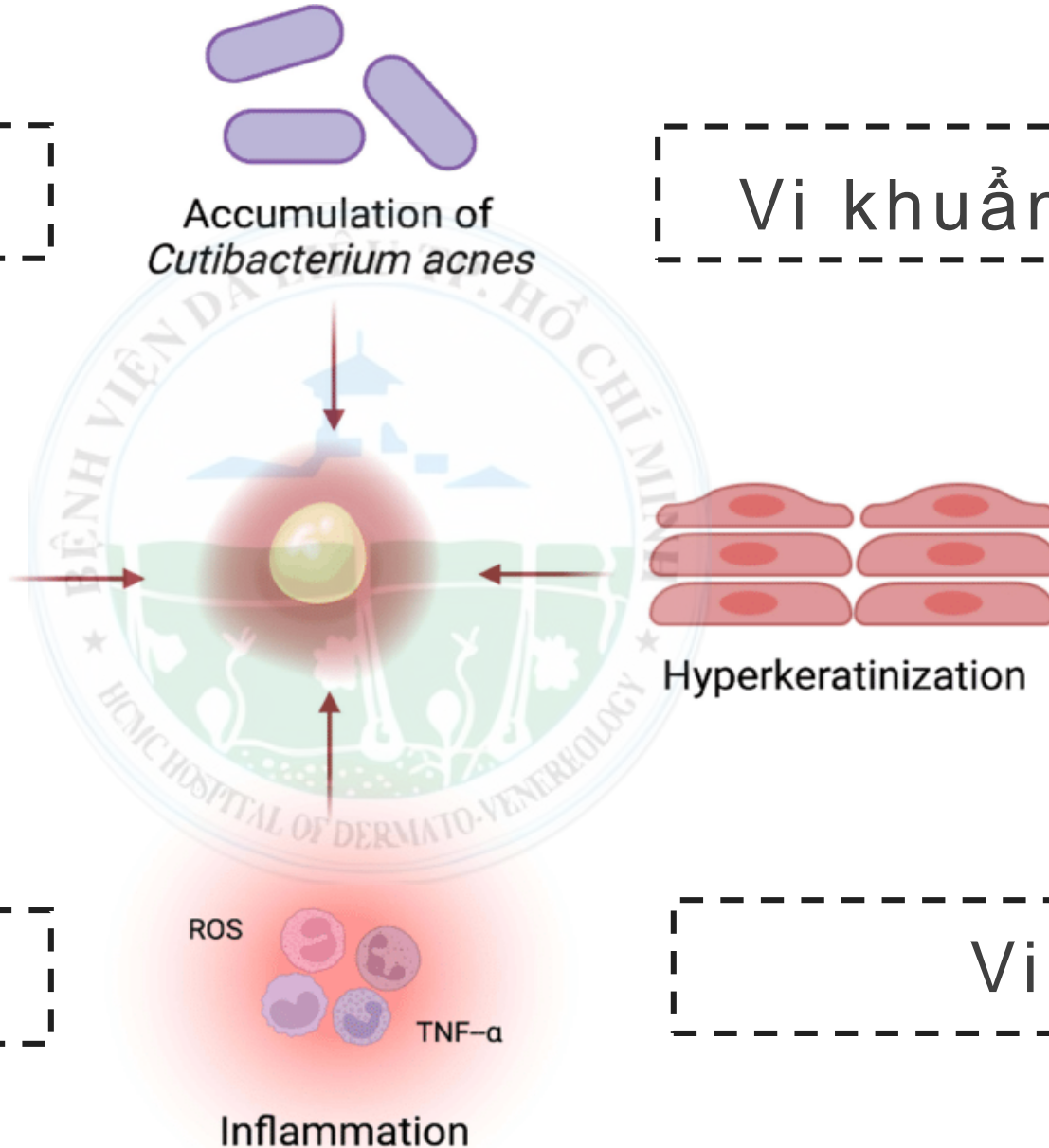
SINH BỆNH HỌC

Tăng hoạt tuyến bã



Increased sebum production

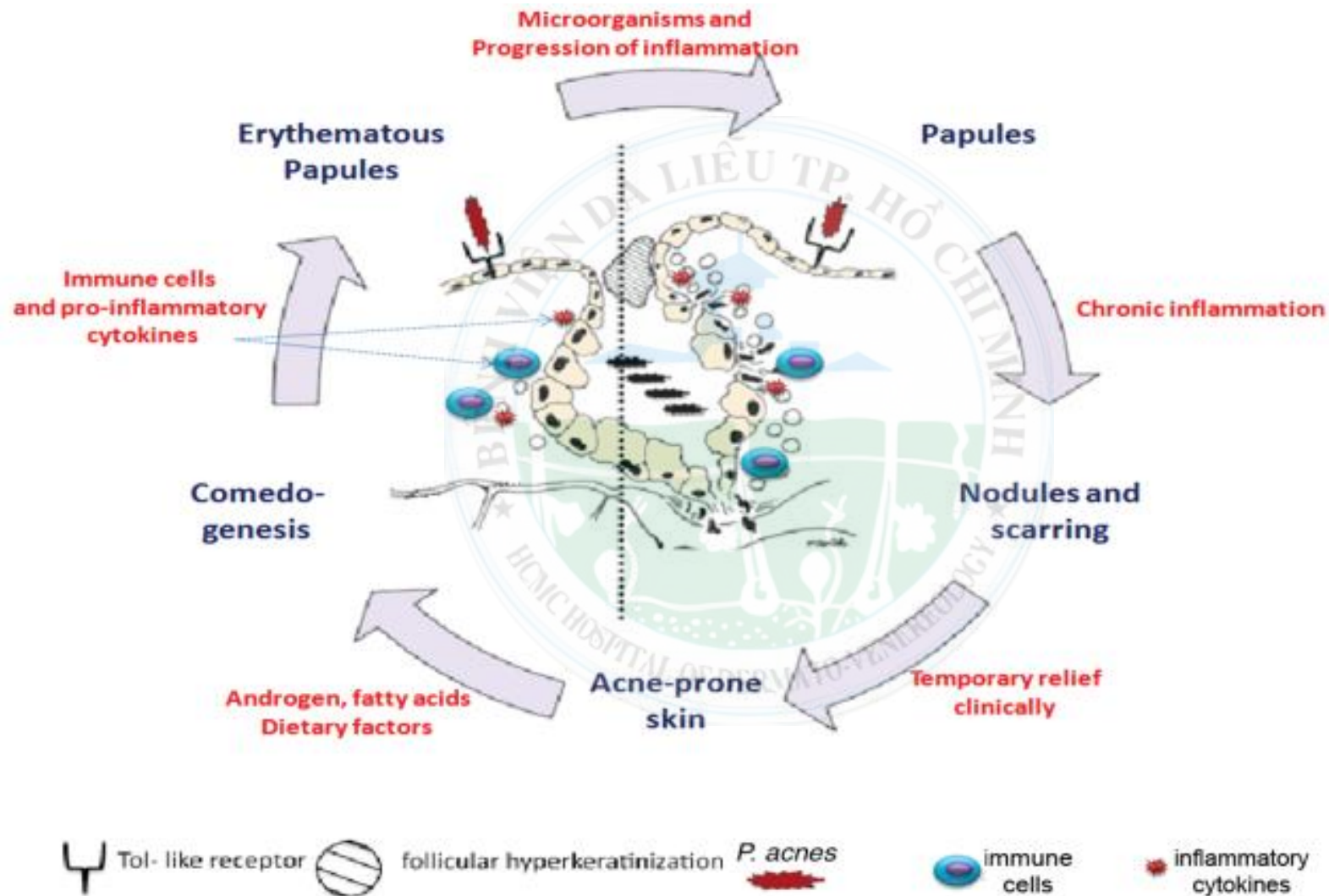
Tăng sừng



Vi khuẩn C.acnes

Viêm

Hiện tượng viêm: sớm, kéo dài



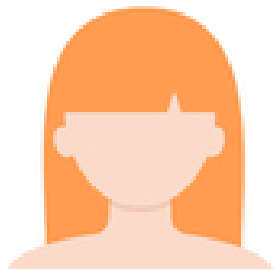


Nature Reviews | **Disease Primers**

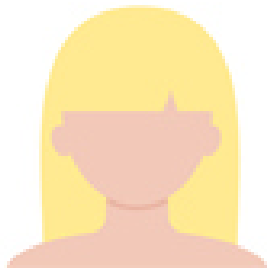
- Hóa chất trung gian gây dẫn mạch

- Quá trình lành thương

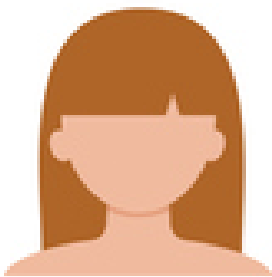
Tuchayi, *et al.* Acne vulgaris. *Nat Rev Dis Primers* 1, 15029 (2015).
<https://doi.org/10.1038/nrdp.2015.29>



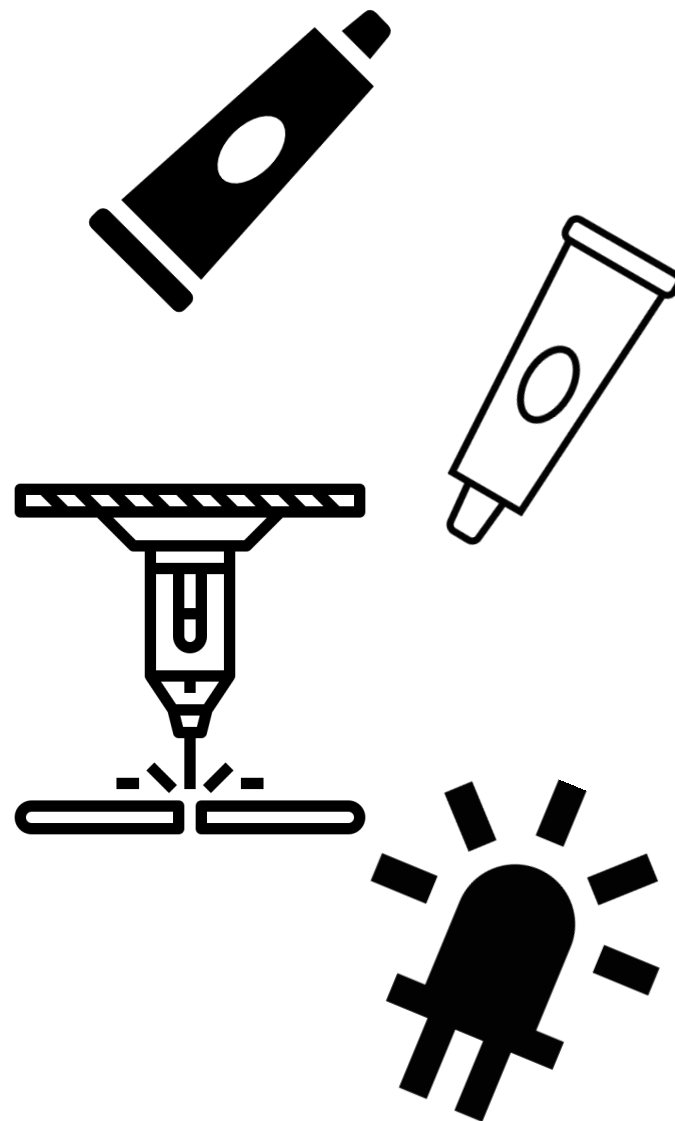
Type 1

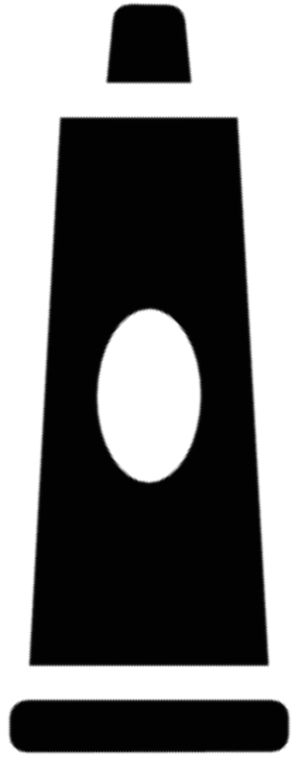


Type 2

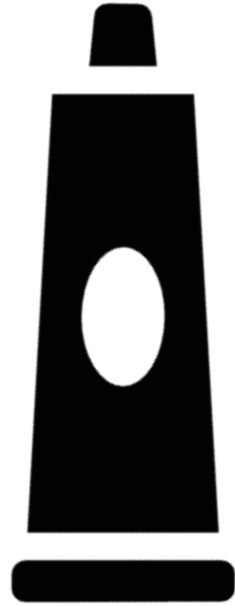


Type 3





**Oxymetazoline
1.5%**



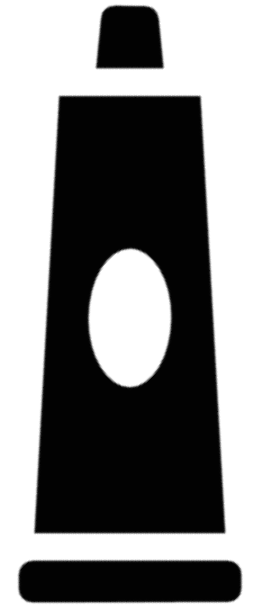
**Tranexamic
acid 5%**



Vitamin C



**Brimonidine
ttrate 0.2%**



**Glyceryl-octyl-ascorbic
acid
Ascorbyl 2- phosphate 6-
palmitate
DL-a-tocopherol**

LED



IPL



LASER



Post-acne erythema treatment: A systematic review of the literature

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Chọn từ **5796** nghiên cứu

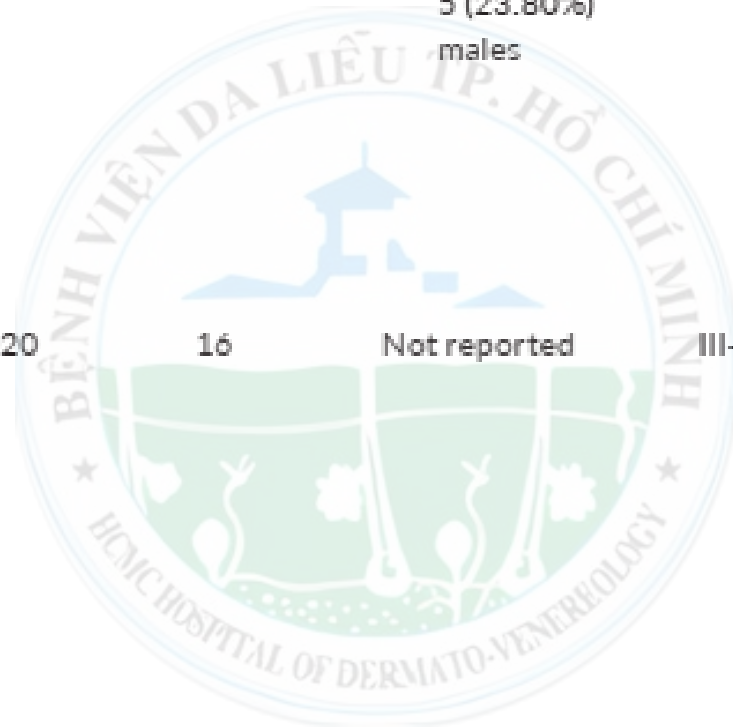
18 nghiên cứu liên quan

LASER/ ÁNH SÁNG là phương pháp phổ biến nhất

Abstract

Post-acne erythema (PAE) is a common sequela of acne inflammation, and it refers to telangiectasia and erythematous lesions remaining after the acne treatment. Although some PAE lesions may improve over time, persisting PAE might be esthetically undesirable for patients. The efficacy of various treatment options for PAE has been investigated in many studies but there exists no gold standard treatment modality. In this study, we aimed to give a systematic literature review on various treatment options for PAE, the advantage of each modality, and compare their efficacy, safety, and feasibility. By using the selected keywords, we carried out a systematic search for articles published from the inception to 28 April 2021 in PubMed/Medline and Embase databases. Of the 5796 initially retrieved articles, 18 of them were fully eligible to be enrolled in our study. In this study, we found that light and laser-based devices were the most frequently used treatments for PAE. Generally, pulsed-dye lasers were the most commonly used laser devices for PAE. Neodymium:yttrium aluminum-garnet lasers were the second most commonly used modalities in treating PAE. Topical treatments such as oxymetazoline, tranexamic acid, and brimonidine tartrate are promising treatments in reducing PAE lesions. In our study, no severe side effects were found. In conclusion, both laser devices and topical agents seem to be effective for PAE lesions; however, further randomized clinical trials are needed in this field.

Reference and the first author	Study design	Publication year	Patient number	Gender	Fitzpatrick	Study group
Light and laser therapy						
Wanitphakdeedecha et al. ¹⁴	Split-face, randomized controlled trial pilot study	2020	21	16 (76.19%) females and 5 (23.80%) males	III-V	Patients face was divided To half and each half randomly Received treatment with 577-nm HOPSL treatment (QuadroStar PRO™, Asclepion Laser Technologies) using the scanner handpiece, 1 mm spot size, 80% coverage, 12-15 J/cm ² , 30 ms, 2 passes or no treatment
Wen et al. ¹¹	A randomized split-face, investigator-blinded study	2020	16	Not reported	III-V	Each participants' face was divided to two sides. One side was treated with a 755 nm picosecond alexandrite laser with a fixed spot size of 6 mm, fluence of 0.71 J/cm ² , pulse repetition of 5 Hz, and two to three passes were applied. The untreated side of the face acted as a control
Sarac et al. ¹²	Clinical trial	2020	40	24 (60%) females and 16 (40%) males	II-IV	577 nm pro-yellow laser with a fluence of 22 J/cm ² in the basic mode



Kim et al. ¹⁶	Case report	2020	1	Female	Not reported	595-nm picosecond-domain neodymium:yttriumaluminum-garnet (Nd:YAG) laser
Mathew et al. ⁹	Retrospective observational study	2018	33	26 (78.78%) females and 7 (21.21%) males	III-IV	Vascular mode of IPL. 560-nm. Fluence ranged from 25 to 46 J/cm ² , pulse width ranged from 4.5 to 5 ms. Pulse delay was kept at 10-20 ms
Ito et al. ¹⁷	Case reports	2017	2	2 (100%) females	Not mentioned	3-step BBL treatment. The modified approach comprised of treatment with a cutoff filter of 420 nm and a pulse duration of 150 ms (step 1), a cutoff filter of 590 nm and a pulse duration of 200 ms (step 2), and a cutoff filter of 590 nm and a pulse duration of 12 s (step 3)
Panchaprateep et al. ⁷	Prospective study	2015	25	8 (32%) females and 17 (68%) males	III-V	Q-switched Nd:YAG laser 585-nm, spot size 5 mm, pulse duration 5-10 ns, fluence 0.30-0.55 J/cm ² and 2-4 passes
Park et al. ⁸	Split-face, evaluator-blinded, randomized pilot study	2014	12	10 (83.33%) females and 2 (16.66%) males	Not reported	Sides of the face were randomized to receive treatment with a fractional laser 1550-nm, erbium glass fractional laser or a PDL

Cindy Bae-Harboe et al. ¹³	Case report	2013	2	1 (50%) female 1 (50%) male	Not reported	Case 1: pulsed-dye laser 595 nm; at a fluence of 6.50 J/cm ² , 3 ms pulse duration, 10 mm spot size, two passes Case 2: pulsed-dye laser, single pass at a fluence of 5.75 J/cm ² , 1.5 ms pulse duration, and 10 mm spot size
Yoon et al. ³	Single-blinded prospective trial	2008	20	15 (75%) females and 5 (25%) males	III-IV	Pulsed-dye laser wavelength 595 nm, spot size 7 mm, pulse duration 10 ms, and fluence 9.5-11 J/cm ²
Glaich et al. ¹⁵	Case report	2007	2	2 (100%) females	I IV	Case 1: Fractional photothermolysis pulse energies ranging from 20 to 24 mJ and total densities of 1000 to 1250 MTZs/cm ² Case 2: Fractional photothermolysis energies ranging from 6 to 8 mJ and total densities of 2000 to 2500 MTZs/cm ²

Laser/ ánh sáng được sử dụng: pulse-dye laser 595nm, IPL, yellow laser 755 nm, fractional laser 1550nm, Q-switched Nd:Yag 585nm, picosecond Nd:Yag 595nm, picosecond alexandrite 755nm

Fitzpatrick type: III – V

Tác dụng phụ: không, hồng ban, phù nề thoáng qua, tăng giảm sắc tố có phục hồi



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- Hiện tượng viêm
- Quá trình lành thương

Hiệu quả điều trị hồng ban, sử dụng phổ biến nhất: **PDL**

Cải thiện hồng ban, tăng sắc tố, giảm nhờn: **IPL**

Hứa hẹn: **Er:Glass 1550nm > PDL (?), pro-yellow laser > PDL**
(?)

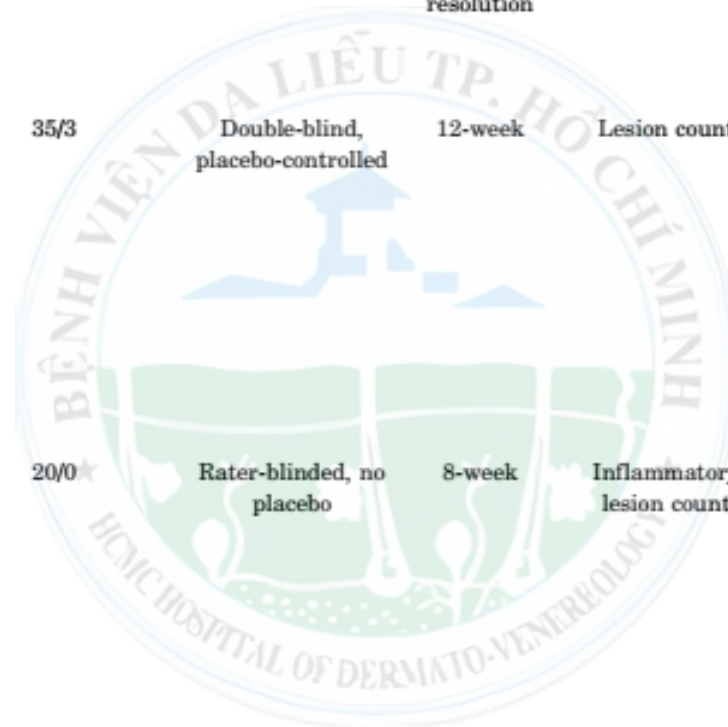
Cần thêm nhiều nghiên cứu: **laser Q-switched, laser pico**

Kalantari Y, et al. Post-acne erythema treatment: A systematic review of the literature. J Cosmet Dermatol. 2022 Apr

Wu X, et al. Intense Pulsed Light Therapy Improves Acne-Induced Post-inflammatory Erythema and Hyperpigmentation: A Retrospective Study in Chinese Patients. Dermatol Ther (Heidelb). 2022

LED TRONG MỤN TRỨNG CÁ

Author	Total # of Patients/Drop-Out	Study Design and Biases	Follow-Up	Primary Outcome	Treatment Parameters	Treatment Regimen	Results	Adverse Events
FDA-cleared LED treatments of skin conditions								
Acne vulgaris (8)—Grade of recommendation: B								
Ash et al. [6]	41/5	Rater-blinded, no placebo	12-week	Lesion count	LED-BL (414-nm, 17.6 J/cm ²)* No treatment	Every other day for 8 weeks	50.08% decrease 2.45% increase	None reported
Gold et al. [7]	30/0	Placebo-controlled, split-face	10-day or until resolution	Lesion size	LED-BL (414-nm)* Sham placebo	Four treatments over 2 days	Lesion size—76% decrease Clearance—37% decrease Lesion size—41% decrease Clearance—10%	None reported
Kwon et al. [8]	35/3	Double-blind, placebo-controlled	12-week	Lesion count	LED-BL (420-nm, 6.1 mW/cm ² , 0.91 J/cm ²) and LED-RL (660-nm, 8.1 mW/cm ² , 1.22 J/cm ²) for 2.5 minutes (100% duty cycle) Sham placebo	Twice daily for 4 weeks	Inflammatory lesions—77% decrease Non-inflammatory lesions—54% decrease No significant change from baseline	Mild dryness, erythema, and desquamation
Liu et al. [9]	20/0*	Rater-blinded, no placebo	8-week	Inflammatory lesion count	LED-BL (405-nm, 6.0 mW/cm ² , 7.2 J/cm ²) for 20 minutes. Five regions of face received 20% each of total irradiation LED-RL (630-nm, 9.6 mW/cm ² , 11.52 J/cm ²) for 20 minutes. Five regions of face received 20% each of total irradiation	Twice weekly for 4 weeks	71.4% decrease 19.5% decrease	Skin dryness
Liu et al. [10]	150/0	Split-face, no placebo, no blinding	4-month	Sessions till 90% clearance of inflammatory lesions	5% ALA PDT (633-nm, 105 mW/cm ² , 126 J/cm ²) for 20 minutes IPL (420-nm, 11-15 J/cm ² , 30-40 ms pulses)	Weekly until 90% clearance	3 ± 1.52 sessions 6 ± 2.15 sessions	PDT: Pain, erythema, and edema LED and IPL: Minimal erythema and stinging



LED TRONG MỤN TRÚNG CÁ

Author	Total # of Patients/Drop-Out	Study Design and Biases	Follow-Up	Primary Outcome	Treatment Parameters	Treatment Regimen	Results	Adverse Events
Na et al. [11]	30/2	Split-face, rater-blinded, no placebo	16-week	Lesion count	LED-RL (633-nm, 105 mW/cm ² , 126 J/cm ² , 50% duty cycle) and LED-BL (415-nm, 40 mW/cm ² , 48 J/cm ² , 50% duty cycle) for 40 minutes LED-RL (635-670-nm; 6 mW/cm ² , 5.4 J/cm ² , 100% duty cycle) for 15 minutes No treatment	Twice weekly until 90% clearance Twice a day for 8 weeks	9 ± 3.34 sessions Inflammatory lesions—66% decrease Non-inflammatory lesions—59% decrease Inflammatory lesions—74% increase Non-inflammatory lesions—3% increase	Burning sensation
Nestor et al. [12]	105/13	Double-blinded, no placebo, missing control groups	12-week	Lesion count	LED-BL (445-nm) and LED-RL (630-nm)* LED-BL and LED-RL and 1% salicylic acid/retinol* Topical benzoyl peroxide	N/A	Inflammatory lesions—24.4% decrease Non-inflammatory lesions—19.5% decrease Inflammatory lesions—22.7% decrease Non-inflammatory lesions—4.8% decrease Inflammatory lesions—17.2% decrease Non-inflammatory lesions—6.3% decrease	No adverse events
Sami et al. [13]	45/0	Split-face, rater-blinded, no placebo	1-month following last treatment	Sessions till 90% clearance of inflammatory lesions	PDL (595-nm, 6-8 J/cm ² , 40 ms pulse, 75% duty cycle) IPL (550-1200-nm, 22 J/cm ² , 30 ms pulses) LED-RL (623-nm, 40 mW/cm ² , 48 J/cm ² , 50% duty cycle) and LED-BL (470-nm, 10 mW/cm ² , 12 J/cm ² , 50% duty cycle) for 20 minutes	Weekly until 90% clearance Twice weekly until 90% clearance	4.1 ± 1.39 sessions 6.0 ± 2.05 sessions 10 ± 3.34 sessions	PDL: Mild purpura and PIH LED: No adverse events IPL: Slight stinging and erythema



LED TRONG MỤN TRỨNG CÁ

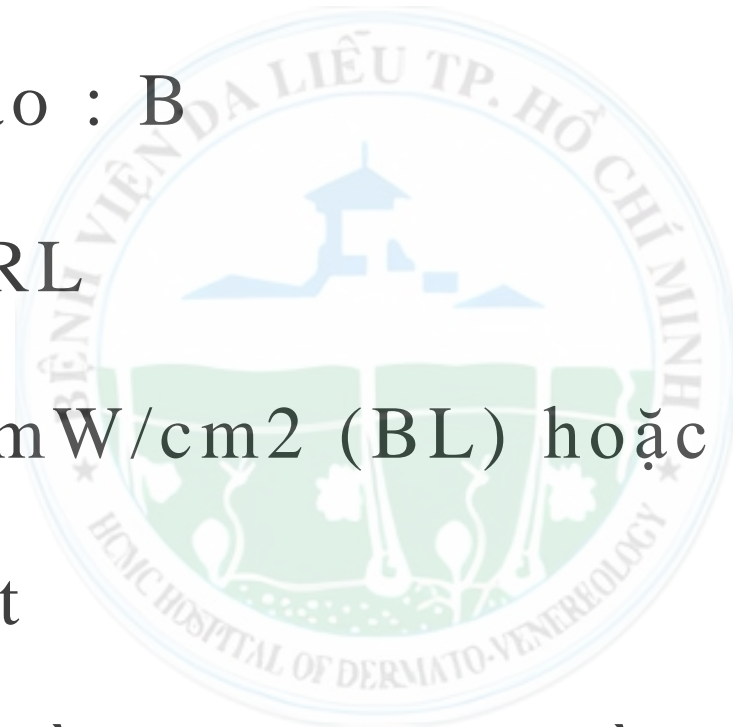
Mức độ khuyến cáo : B

LED-BL và LED-RL

Năng lượng: 6-40mW/cm² (BL) hoặc 8-100mW/cm² (RL)

Thời gian: 20 phút

Tần suất : 2 lần/ tuần trong 4-8 tuần



KẾT LUẬN

Hồng ban là hiện tượng thường gặp sau mụn trứng cá, gây ảnh hưởng không nhỏ đến chất lượng cuộc sống

Cơ chế bệnh sinh phức tạp, bao gồm hiện tượng viêm và quá trình lành thương

PDL, IPL, LED là những thiết bị mang lại hiệu quả cao, cần lưu ý lựa chọn bệnh nhân phù hợp để đảm bảo an toàn

thank
you

