

EXECUTIVE SUMMARY

Fractionated 1064-nm Picosecond Laser with Holographic Optics vs. Fractional CO₂ for Atrophic Acne Scars

Yuan Y, He Y, Fang J, Zhang M, Wu Q. Comparison of the fractionated Nd:YAG 1064-nm picosecond laser with holographic optics and the fractional CO₂ laser in atrophic acne scar treatment: a prospective, randomized, split-face study. *International Journal of Dermatology*. 2025;64(1):85–91. First published online June 24, 2024. DOI: 10.1111/ijd.17296. PMID: 38924534.

Key Research Question

Can a non-ablative fractionated 1064-nm picosecond laser with holographic optics improve atrophic acne scars as effectively as fractional CO₂ while producing fewer adverse effects?

Study Design

This prospective, randomized, split-face study compared a fractionated non-ablative 1064-nm Nd:YAG picosecond laser using holographic optics with fractional CO₂. Opposite sides of each participant's face received the two treatments, allowing each participant to serve as their own control. Three treatment sessions were performed two months apart, with final evaluation three months after the last treatment.

Key Findings

Outcome	Verified Finding
Post-treatment ECCA	Mean ECCA scores did not differ significantly between treatment sides ($P = .209$). This does not prove equivalence.
Physician-rated improvement	The four-point clinical improvement assessment significantly favored fractional CO ₂ ($P = .001$).
Patient perspective	Patient evaluation of improvement and subjective satisfaction were reported as consistent with the physicians' four-point assessment; exact numerical values were not available in the accessible abstract.
Adverse effects	The fractionated 1064-nm picosecond-treated side experienced significantly fewer adverse effects than the fractional CO ₂ side ($P < .001$).

Evidence Interpretation

The results are best interpreted as an efficacy-versus-tolerability tradeoff. Fractional CO₂ produced stronger physician-rated clinical improvement, while the fractionated picosecond protocol produced fewer adverse effects. The absence of a significant ECCA difference should not be interpreted as proof that the treatments were equivalent.

Strengths

The prospective randomized split-face design reduces between-patient variability because the two modalities are compared within the same participant. Multiple perspectives were assessed, including ECCA, physician assessment, patient assessment, satisfaction, preference and adverse effects.

Limitations

The treatments are fundamentally different modalities, including laser medium, wavelength, ablative versus non-ablative tissue interaction and fractional delivery architecture, so the study does not isolate pulse duration. The accessible abstract did not provide enough information to verify sample size/demographics, exact laser models and settings, numerical patient-preference results or individual adverse-event rates. Final follow-up was three months after the third treatment, limiting conclusions about very long-term durability.

Funding / Conflicts

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PLBG Evidence-Based Takeaway

In this prospective, randomized, split-face study, both fractionated 1064-nm picosecond treatment with holographic optics and fractional CO₂ improved atrophic acne scars. Mean post-treatment ECCA scores were not significantly different between treatment sides, but physician-rated clinical improvement significantly favored fractional CO₂, with patient assessments and satisfaction showing a consistent direction. Conversely, the picosecond-treated side experienced significantly fewer adverse effects. The findings therefore suggest an efficacy-versus-tolerability tradeoff between the tested protocols rather than universal superiority of either laser modality.