

The Combination of Photodynamic With Minocycline **Significantly Improved Clinical Efficacy and Quality Of Life** **In Moderate To Severe Facial Acne**

Acne vulgaris is a chronic inflammatory disease of the pilosebaceous unit resulting from androgen-induced increased sebum production, altered keratinization, inflammation, and bacterial colonization of hair follicles on the face, neck, chest, and back by *Propionibacterium acnes*¹. It affects 85% of young people (aged 12–24 years)². Several forms of treatment have been offered for moderate to severe acne including topical and systemic medications. Oral isotretinoin is the current mainstay of systemic therapy; however, it has acknowledged adverse reactions, teratogenicity, and psychological effects, which may restrict its use³. Though controversial, oral antibiotics are still first-line choice in patients with severe inflammatory acne⁴. Minocycline is a semisynthetic, second-generation tetracycline used for a variety of infectious diseases and acne, it is considered to have a superior efficacy in the treatment of inflammatory acne⁵. Photodynamic therapy (PDT) is an emerging modality in the treatment of acne, in which photosensitizers are applied to the skin to produce reactive oxygen species, and, in the setting of light activation, destroy cells that have absorbed the photosensitizer⁶.

A prospective, randomized, controlled clinical trial, published in Dec 2017, and was approved by the Institutional Review Board of Chines PLA General Hospital and was conducted in conformity to the Declaration of Helsinki. A total of 95 patients were randomly assigned to the minocycline plus PDT group or minocycline-alone group using computer-generated random numbers, which were packaged in envelopes. Male and female patients aged 15 to 35 years with moderate to severe facial acne vulgaris were enrolled. Moderate to severe acne was defined by the Investigator Global Assessment (IGA) scale of 3 or 4⁷. Patients were to have ≥ 10 inflammatory lesions (papules, pustules, or nodules) and ≥ 10 non-inflammatory lesions (open and closed comedones) on the face. Eligible patients in the minocycline group took the minocycline hydrochloride capsule 100mg/d for 4 weeks, whereas patients in the minocycline plus PDT group received PDT apart from taking minocycline as patients in the minocycline group. Patients received 4 PDT treatments once a week at weeks 0, 1, 2, and 3. Efficacy was assessed by the IGA score, standardized counts of inflammatory and non-inflammatory lesions, the Dermatology Life Quality Index (DLQI), and reduction rate of acne lesions. Evaluations were conducted before study, and 2, 4, 6, and 8 weeks after first treatment. The primary end point was efficacy of photodynamic therapy combined with minocycline for treatment of moderate to severe facial acne vulgaris, and the secondary end points was Influence on quality of life (QOL) and safety evaluation⁸.

There were no statistically significant differences in characteristics between 2 treatment groups at baseline. Minocycline plus PDT treatment led to a greater mean percentage reduction from baseline in lesion counts versus minocycline alone at 8 weeks for both

inflammatory (-74.4% vs -53.3%; $P < 0.001$) and non-inflammatory lesions (-61.7% vs -42.4%; $P < 0.001$). More patients treated with minocycline plus PDT achieved IGA score < 2 at study end (week 8: 30/48 vs 20/47; $P < 0.05$). Patients treated with minocycline plus PDT got significant lower DLQI at 8 weeks (4.4 vs 6.3; $P < 0.001$). Adverse events were mild and manageable⁸.

In conclusion; compared with minocycline alone, the combination of PDT with minocycline significantly improved clinical efficacy and QOL in moderate to severe facial acne patients. Light therapies (especially the PDT) are playing a more and more important role in acne treatment. It offers an alternative to patients who seek topical treatments, a quicker onset of action, nonserious side effects, and decreased antibiotic resistance rates. In future, the using of PDT as a single therapy in acne treatment should be studied.

References:

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