TREATMENT OF MODERATE TO SEVERE INFLAMMATORY ACNE VULGARIS: PHOTODYNAMIC THERAPY WITH 5-AMINOLEVULINIC ACID AND A NOVEL ADVANCED FLUORESCENCE TECHNOLOGY PULSED LIGHT SOURCE

Michael H. Gold MD,[a,b] Julie A. Biron BS,[b] Molly Boring RN BSN MSN FNP-C CCRC,[b]
Tancy M. Bridges RN NP,[b] Virginia L. Bradshaw RN BA MSN NP-C[b]

a. Gold Skin Care Center, Nashville, TN

b. Tennessee Clinical Research Center, Nashville, TN

Abstract

The use of photodynamic therapy (PDT) with 20% 5-aminolevulinic acid (ALA) for the treatment of acne vulgaris has been explored. This study evaluates the safety and efficacy of a new Advanced Fluorescence Technology (AFT) pulsed light source (420-950 nm) for photoactivation in ALA PDT for the treatment of moderate to severe inflammatory facial acne vulgaris. Nineteen subjects received 4 ALA PDT treatments with the AFT pulsed light source. Treatments were spaced 2 weeks apart. ALA was incubated for 15 to 30 minutes. At the end of the fourth treatment, the total reductions in inflammatory and noninflammatory lesion counts were 54.5% and 37.5%, respectively. Median Global Severity Scores suggest a trend toward reduction after several treatments. Investigator and subject assessments show moderate to marked improvement in most patients. The new AFT pulsed light source with ALA PDT appears to be a safe and effective modality for the treatment of moderate to severe inflammatory acne vulgaris.

Introduction

The use of photodynamic therapy (PDT) with 20% 5-aminolevulinic acid (ALA) for the treatment of mild to severe acne vulgaris has been explored by many investigators. The rationale for this approach is based on the update of exogenous ALA by pilosebaceous units, the conversion of ALA to photosensitive protoporphyrin IX (PpIX), the production of porphyrins by *Propionibacterium acnes*, and the photoexitation of PpIX and bacterial porphyrins to form cytotoxic singlet oxygen. A variety of light sources and lasers have been used for photoactivation of ALA-induced PpIX[1-3] and methyl aminolevulinate (MAL) has also been used as photosensitizing agent.[4] A panel of experts has recently agreed that ALA PDT is generally more effective against inflammatory and cystic acne than comedonal acne.[3]

This study evaluates the safety and efficacy of a new pulsed light source (420-950 nm) with Advanced Fluorescent Technology (AFT) for photoactivation in ALA PDT for the treatment of moderate to severe inflammatory acne vulgaris of the face.

Materials and Methods

Nineteen healthy subjects (aged 19 to 46 years, skin types II-VI, all women) with moderate to severe inflammatory acne of the face (at least 20 inflammatory lesions and a Global Severity Score of 2) participated in the study. The study was approved by the Essex Institutional Review Board, Inc., and all subjects gave signed informed consent to treatment. Subjects were excluded if their histories included previous treatment with laser or light devices or ALA to areas to be treated, severe comedonal acne, autoimmune disease, porphyria or allergy to porphyrins, abnormal photosensitivity, mental illness, topical acne medications within the previous 2 weeks, systemic antibiotics or steroids within the previous 4 weeks, systemic retinoids within the previous 6 months, treatment with an investigational drug within the previous 30 days, dermal filler treatments, botulinum toxin, chemical peels, dermabrasion, keloid or scar formation, uncorrected coagulation defects, or any condition which, in the investigator's opinion, would make it unsafe to participate in this study. Pregnancy or unacceptable methods of birth control were also grounds for exclusion.

At the beginning of the study subjects were given a cleanser to use throughout the study and beginning at least 7 days prior to the first study medication application. Subjects were

Figure 1. Reductions in median number of inflammatory (papules, pustules, nodules) and noninflammatory (comedones, open and closed) lesion counts from week 1. Treatments were given on weeks 1, 3, 5, and 7. The greatest reductions occurred after the first treatment in both types of lesions. Improvement appears to level off, then continue for at least 4 weeks after the final treatment. At the end of week 11, the total reductions in inflammatory and noninflammatory lesion counts were 54.5% and 37.5%, respectively.