Acne is one of the most frequent skin diseases. The estimated prevalence of acne in adolescents living in Western industrialized countries ranges between 50% and 95% and the only moderate or severe manifestations represent the 20–35% of the total. At present, systemic isotretinoin is considered the first-choice treatment for severe acne for clinical effectiveness, prevention of scarring and quick improvement of a patient’s QOL. Systemic antibiotics are recommended for the treatment of severe papulo-pustular acne. Visible light monotherapy is not recommended for the treatment of conglobate acne even if blue light monotherapy could be considered for the treatment of mild to moderate papulo-pustular acne, but with a low strength of recommendation.

However, the efficacy of a novel treatment with LED blue light device (415/446 nm), using specific photo-converter chromophores contained in a gel (LED/gel), has been described in the treatment of acne, but never combined with systemic drugs. Our objective is to describe the efficacy and safety of the combination of LED/gel with systemic drugs such as low-dose isotretinoin or tetracycline in moderate to severe acne in patients not eligible to standard dose of retinoids or in whom a tetracycline combined with topical drugs could not be sufficient.

**WAY OF ACTION**

The chromophore gel-assisted light therapy is based on photophysical reactions between a photoconverter gel and a blue light. A thin layer of a topical Photo Converter Gel containing specific chromophores (light-absorbing molecules mainly composed of eosin), which are not absorbed by the skin, is topically applied to the targeted skin area.

The gel is subsequently illuminated by a Multi LED Blue Light Device with specific photoconverter CROMOPHORES (LED/gel), coherently blue light with an absorbing wavelength of 450–460 nm. This creates an energy shifting of fluorescent energy shifting the light from shorter blue wavelengths to longer wavelengths within the blue, green, yellow, orange, and red spectrum (400 to 650nm). Compared to blue light, which has limited skin penetration these wavelengths have the capacity to penetrate to various depths of the skin and to stimulate the skin tissues and cells (red light for example can reach deeper sebaceous glands and may have an anti-inflammatory effect through cytokine release).

Afterwards, the exhausted photoconverter gel is fully removed by cleansing just after the illumination period.

**RESULTS**

Efficacy evaluations at week 6 and 12 were performed. No patients discontinued the study. A few days after treatment and a slight sensation of burning during treatment was evident. This was attributed to light energy irrigation. No UV light or infrared light is emitted or generated. 80% of patients treated achieved at week 12 the primary endpoint of a reduction of at least 2 grades in the IGA scale. In 50% this reduction was evident from week 6. This fast clinical improvement, most of all when using low doses of isotretinoin, seems to be related to the contribution of biophysical therapy. No severe adverse events were reported during the treatment, with special reference to photosensitivity manifestations, and a good tolerance of the treatment was referred by patients.

**CONCLUSIONS**

A LED blue light device with specific photoconverter chromophores combined with systemic drugs: efficacy and safety in the treatment of moderate to severe acne.

**PATIENTS AND METHODS**

**CASE STUDY:** 10 patients affected by severe papulo-pustular or conglobate acne (6 males and 4 females) were treated.

**INCLUSION CRITERIA:**
- IGA 3–4 (severe papulo-pustular or conglobate acne)
- Absence of previous acne treatments
- Patients not eligible to standard dose of retinoids or refusal of a standard dosage therapy with isotretinoin for collateral effects or not reaching clearance with tetracyclines added to topical therapy
- No isotretinoin or tetracycline systemic treatments in last 12 months
- No topical retinoid treatments in last 6 months
- No use of drugs known to increase photosensitivity
- No use of corticosteroids within last 6 months
- No pregnancy or breast-feeding

**MATERIALS AND METHODS**

Baseline grading of acne was performed according to the Investigator’s Global Assessment (IGA) scale. Each patient received 6 weeks of treatment, once weekly with two treatments in the same day with a time interval of 2 hours and using one box of gel a week splitting material need for one-session treatment in two.

On the first day of light therapy the patients started systemic treatment too that was regularly continued after the end of biophotonic cycle. Efficacy evaluations at week 6 and 12 were performed.

**EFFICACY AND SAFETY**

Some patients reported treatment-related adverse events of varying degrees, but never severe or impairing the therapy, as transient erythema rarely lasting more than 36 hrs, skin hyperpigmentation of a few days and a slight sensation of burning during the treatment; no one reported hair colour lightening. No patients discontinued the study. Efficacy evaluations at week 6 and 12 were performed using IGA scale.