

The 308nm Excimer Light - targeted phototherapy for responsive dermatoses

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Phototherapy is an important treatment modality offered by dermatologists. The terms targeted phototherapy refer to ultraviolet light treatment that is targeted at the affected skin only. The 308 nm excimer light is an example of a targeted phototherapy device. Other phototherapy devices that are capable of targeting affected skin include the excimer laser and UV light sources with improved hand-held delivery systems.

Targeted phototherapy

Targeted phototherapy has several advantages over conventional phototherapy:

1. Only affected areas are treated, sparing normal tissue, thereby reducing the incidence of side effects, including the potential risk of skin cancer.
2. Quick delivery of energy, therefore shortened duration of treatment per session. The treatment time is measured in seconds rather than minutes eg. the starting dose for vitiligo is delivered in just 2 seconds.
3. Delivery of higher doses of energy (super-erythemogenic doses) selectively to the lesions, because uninvolved skin is not exposed, resulting in enhanced efficacy, faster response, shortened total duration of treatment, less frequent visits to the facility and less inconvenience to the patient.
4. The handpiece allows treatment of difficult areas such as the scalp, nose, genitalia, ears and oral mucosa.
5. Easy administration for children who may be intimidated by larger devices.
6. Targeted phototherapy machines occupy less space.

Mechanism of action

The mechanism of action of excimer light is similar to narrow band UVB in that it induces DNA damage and pyrimidine dimer formation in epidermal and dermal cells and induces apoptosis.

Other notable effects on the skin include an alteration of cytokine production, local immunosuppression, stimulation of melanocyte stimulating hormone, increased melanocyte proliferation and melanogenesis.

Clinical studies show that the excimer laser and excimer light are equivalent in terms of efficacy and safety. One major advantage of excimer light compared to laser is that the former does not require replacement of xenon chloride gas, resulting in significantly lower running costs.

The newest generation excimer light device is now equipped with built-in protocols for psoriasis, eczema, vitiligo, alopecia areata and mycosis fungoides. Doses are suggested by the device and adjustments are made depending on the response to the last treatment.

In addition, special oral adaptors are available for treatment of mouth lesions such as oral lichen planus.

Treatment

Treatment with excimer light may be performed once, twice or three times a week.

Response depends on the total number of treatments rather than its frequency.

Side effects include sunburn type reactions but these are uncommon if recommended protocols are adhered to.

The performance of the minimal erythema dose test is useful in the early stages of use of excimer light devices. However, with user experience, the determination of skin phototype is usually enough to administer treatment.



Indications

INDICATIONS OF EXCIMER LIGHT

- Psoriasis
- Atopic dermatitis
- Eczema
- Vitiligo
- Alopecia areata
- Lichen planus
- Mycosis fungoides
- Lymphomatoid papulosis
- Hypopigmented stretch marks
- Hypopigmented scars

Author's experience

The author has been using an excimer laser (Pharos, USA) since 2007. This was replaced with the Quantel excimer light in 2011 and most recently (2015) with the ExSys 308 excimer light from German Medical Engineering (GME). The main disadvantage of the excimer laser was its running cost. It was subject to frequent breakdown and required expensive xenon chloride gas every 10 months.

The ExSys 308 is equipped with automatic protocols for the most common indications, making the selection of treatment doses simple and easy to administer. The device has a small compact design and fits on a table top or a cart. The handpiece is connected to the base by means of a fibreoptic cable. The handpiece has a large treatment area of 50mm x 35mm which is customisable by selecting treatment tips of varying sizes. The power density is 100Mw/cm², resulting in short treatment times of 1-3 seconds for vitiligo and 2-7 seconds for psoriasis. It is capable of reaching a maximum dose of 6000mj/cm². The measurement of minimal erythema dose is automated.

A unique feature is the availability of oral adaptors for the treatment of oral lesions such as lichen planus.

Treatment is performed once a week. MED tests are no longer performed in the practice as it is more convenient to use skin phototype to determine the dose administered.

Patients with psoriasis are encouraged to continue using topical medications such as Dovobet (Betamethasone/ Calcipotriol) and salicylic acid or urea based emollients.

Vitiligo treatment is often combined with needling and topical antioxidants (Vitix - superoxide dismutase/pseudocatalase).

Conclusion

Excimer light represents a significant advance in the delivery of UV light to affected areas of psoriasis, eczema, vitiligo, alopecia areata, lichen planus and other responsive dermatoses and forms an important component of the dermatologist's armamentarium of phototherapy devices.

Reference:

Mysore V. Targeted phototherapy. *Indian J Dermatol Venereol Leprol* 2009;75:119-25.



Figure 1: 308nm excimer light (ExSys, German Medical Engineering)



Figure 2: Handpiece with customisable tips

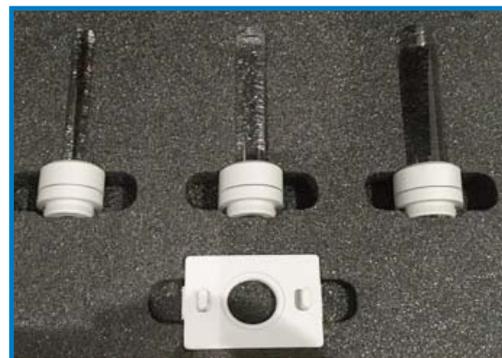


Figure 3: Oral adaptors in various sizes to treat oral lesions such as lichen planus

Examples of patients treated with the ExSys 308 excimer light

BEFORE



AFTER



Figure 4: After 4 treatments with excimer light (ExSys 308)



Figure 5: Psoriasis, after (R) 4 treatments with excimer light (ExSys 308)



Figure 6: Psoriasis after 2 treatments with excimer light (ExSys 308)



Figure 7: Almost complete repigmentation was achieved in 16 treatment with excimer light (ExSys 308) combined with needling and vitix gel. The colour match is excellent.



Examples of patients treated with the ExSys 308 excimer light

BEFORE



AFTER



Figure 8: After just 2 treatment, the vitiligo area has achieved more than 60% cover. The treatment was combined with vitix gel.



Figure 9: Vitiligo after 13 treatment with excimer light (ExSys 308), needling and vitix gel.



Figure 10: Alopecia areata after 5 treatments of excimer light (ExSys 308) combined with intralesional steroids.



Figure 11: Treatment of oral lichen planus with the oral applicator, showing results after just two treatment sessions.