Phototherapy to treat eczema

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Phototherapy or light therapy refers to the use of ultraviolet (UV) light to treat moderate to severe eczema in adults (and sometimes in school-aged children) in cases where topical therapies alone have not been effective. Phototherapy is a second-line treatment option that is usually only available at a specialist clinic or hospital.

To be considered for phototherapy treatment, you first need to be referred to a consultant dermatologist who may prescribe a course of phototherapy. Your phototherapy treatment will then be supervised by a trained healthcare professional (a dermatology nurse or occasionally a physiotherapist).

WHAT IS PHOTOTHERAPY?

During phototherapy treatment, the patient stands inside a specially designed cabinet (or uses smaller hand and foot cabinets) containing fluorescent tubes that administer UV light to the skin.

In nature, UV radiation is part of the electromagnetic (light) spectrum that reaches the earth from the sun. UV wavelengths are classified as UVA, UVB or UVC. The latter has the shortest rays, and is mostly absorbed by the ozone layer, so does not reach the earth. However, both UVA and UVB penetrate the atmosphere (90% UVA and 10% UVB). UV light is important for health (vitamin D production) and is responsible for tanning, but over-exposure causes premature skin aging. Excessive UV radiation causes skin cell damage that can lead to skin cancer.

HOW DOES PHOTOTHERAPY WORK?

Natural sunlight can help reduce symptoms in eczema for some people. For others, symptoms may become worse. Both UVA and UVB light are used as treatments in phototherapy.

Although phototherapy treatment can be beneficial in the treatment of eczema, with improved symptoms and a reduction in the need for topical steroids, eczema symptoms can recur for some patients once phototherapy is stopped.

UV light in eczema appears to have an effect on the immune system. In particular, it seems to reduce the number of white cells (T-cells) in the skin. They are responsible for causing inflammation and are known to play an important part in the eczematous process, making your skin red, itchy and sore. A reduced number of white cells results in less inflammation and an associated improvement in any areas of eczema.

Improvement with phototherapy happens gradually after several weeks of regular treatments. There is a reduction of itching and the eczema slowly clears as treatments continue. Once there is absence of itching and clearance of most, if not all, of the active eczema, a controlled period of reducing the frequency of treatments is often used successfully to 'wean the patient off', thereby reducing any likelihood of an early flare, and inducing remission. It is important to attend treatment sessions regularly in order to optimise the chances of success.

WHAT ARE THE DIFFERENT TYPES OF PHOTOTHERAPY?

There are three types of phototherapy used in the treatment of atopic eczema – broadband UVB, narrowband UVB and UVA. Sometimes other wavelengths of light, known as UVA1, or combined treatment with UVA and UVB may be used, but these are less commonly available.

Broadband UVB (type B UV light) phototherapy

This is the original phototherapy treatment and has been used for 80 years. The length of treatment increases at each visit unless the skin becomes pink. Broadband UVB is not very effective at clearing skin conditions such as eczema and has now largely been replaced with a different type of UVB called narrowband UVB (often called TL0-1).

Narrowband UVB (TL-01) phototherapy

In narrowband phototherapy, the light tubes produce a narrow part of the UVB spectrum – two wavelengths between 311 and 313 nm (nanometres) – which penetrates more effectively into the skin than the older broadband sources and is able to reduce inflammation and itching and improve the

flare of eczema. The dose of UV given at each treatment is also higher compared to the broadband dose because many of the unwanted wavelengths that cause burning are excluded. Once clearance is achieved, narrowband UVB can often induce a longer period of clear skin. A course of treatment to clear eczema involves two or three appointments per week (a total of 20–40 treatments, depending on response). The time spent in the machine at the beginning is very short and gradually increases at each visit.

UVA phototherapy

This treatment uses longwave UVA light in conjunction with a photosensitising medicine called psoralen – a combination known as PUVA. Psoralen can be taken in tablet form 2–3 hours prior to each treatment, or added as a liquid to a bath of warm water in which the person soaks for 15 minutes. Alternatively, psoralen can be applied directly to small areas of skin as a gel. PUVA treatment is administered to the whole body in a stand-up cabin or can be given to localised areas such as the hands and feet with smaller, compact machines.

HOW LONG AND WHAT DOSAGE IS A COURSE OF PHOTOTHERAPY TREATMENT?

Phototherapy treatment courses are usually given 2–3 times a week for UVB and twice a week for PUVA. Both UVB and PUVA courses last on average around 3 months – maybe longer for severe cases. Shorter courses may also be given. Sometimes, weekly 'maintenance courses' are recommended for a short period after clearance. It is important that you are able to commit to a course of phototherapy as it may take some weeks before you see the benefits of treatment.

UVA and narrowband UVB treatment sessions are administered with a dose of light called Joules. A Joule is a unit of light energy. Your dose (J/cm^2) is individual and will depend on the colour of your skin (or skin type) or – more accurately – by a baseline series of six to ten small test doses of UV to your skin. This skin patch test is called a minimal erythema dose (MED) for UVB and minimal phototoxic dose (MPD) for PUVA. Generally, the dose at which clearance is achieved is up to 5J/cm^2 of UVB and up to 15J/cm^2 for tablet PUVA. However, dosage depends on your skin type, as phototherapy needs to be tailored to the individual and very carefully administered and monitored.

WHEN IS PHOTOTHERAPY USED?

Phototherapy may be used for adults and older children with moderate to severe eczema that is not responding to conventional treatment with topical steroids and emollients. Phototherapy is not usually used in individuals who have UV-sensitive dermatitis/eczema or any other photo-allergic disorder. Patients with these types of eczema are best treated in specialist units.

Narrowband UVB may be helpful for patients with moderate to severe eczema requiring long-term topical steroid use, whereas PUVA is usually more effective for more severe disease that has not responded well to narrowband UVB.

It is important to remember that the total amount of lifetime treatments that can be given is limited because long-term phototherapy poses an increased risk of skin cancer. PUVA should not be used during pregnancy or breastfeeding because of the risk of damage secondary to the psoralen. However, broadband UVB and narrowband UVB can be used in both pregnancy and when breastfeeding.

WHAT ARE THE SIDE EFFECTS?

UVB light treatment is usually well tolerated. However, some patients may experience redness or itching of the skin after treatment. It is important to report any side effects to phototherapy staff so that adjustments can be made to the doses.

Sometimes psoralen tablets can cause nausea – again, adjustments can be made in relation to the type of psoralen tablet to try to prevent this side effect of treatment.

In order to prevent UVA wavelengths entering the eyes and possibly increasing the risk of cataracts in the long term, protective goggles will be provided by the dermatology department to be worn during the actual treatment, and glasses with UV protection need to be worn for 12–24 hours after oral PUVA, though not usually with bath PUVA. (Bath PUVA does cause systemic absorption but it is short term, whereas PUVA tablets mean the whole skin is sensitised to light for 24 hours – hence the need to wear glasses afterwards. Some units ask bath PUVA patients to wear glasses for a short time after treatment, but this is unusual. Since only a small area of the body is made light sensitive with gel PUVA, there is no need to wear glasses after this type of treatment.) The treatment clinic should be able to give advice on the type of sunglasses that are suitable. Clear UV-coatings for non-tinted spectacles are also available.

Despite efforts to prevent burning – by testing the skin's sensitivity to light using controlled incremental doses for each treatment, careful skin assessments and asking about any side effects each visit – occasionally sunburn-type reactions may occur with all types of phototherapy. If this happens, it is important to contact the hospital for appropriate advice.

Phototherapy to treat eczema

Occasionally, eczema may flare at the beginning of a course of phototherapy. This can usually be managed by making adjustments to doses and using topical steroids and emollients to settle the flare. In patients prone to *eczema herpeticum* (eczema infected with the cold-sore virus), phototherapy can sometimes trigger reactivation of the infection, which needs treatment with antiviral tablets (e.g. aciclovir). Patients with a history of cold sores triggered by sunlight should routinely wear sunblock in the phototherapy machine during treatments to prevent any reoccurrence.

As with exposure to natural sunlight, long-term use of UV light therapy can result in accelerated aging of the skin (e.g. freckles and wrinkles). More importantly, there is a potential risk of developing skin cancers. There is a greater long-term risk of developing skin cancer with PUVA compared to UVB, which is why UVB is considered safer in the long term and PUVA is used less frequently.

Men usually cover their genitals with a close-fitting pouch/jock strap unless this area needs treatment. This is because skin in the male genital area is much thinner and sensitive to light and has an increased risk of some skin cancers if exposed to UV light. It is important to cover the same area for each treatment to prevent burning.

After starting a course of treatment, care should be taken to avoid further exposure to UV light. Therefore, it is important not to sunbathe – you should wear sun protection (25 SPF, applied every 2–3 hours) when outside and wear a sunhat on a sunny day. Sun beds are prohibited during a course of phototherapy treatment as they would increase the UV dose and could cause severe burning.

In fact, sun beds should never be used in a tanning salon or bought for home use by people with eczema. They are not an alternative to phototherapy as you are not carefully monitored and there are no controls over the dose of UV light. Sunbeds generally use UVA light but recently the World Health Organisation (WHO) has identified sun beds that produce higher levels of UVB to speed the tanning process. It is important to note that, because of the increased risk of developing skin cancer, the WHO does not recommend the use of sun beds by anyone for cosmetic purposes and only endorses medically supervised light treatment for skin conditions.

DO I STILL USE MY EMOLLIENTS AND TOPICAL TREATMENTS?

You should continue to use emollients during a course of phototherapy. However, you should check with the doctor or nurse that your emollient is suitable as some emollients can block UV light. You may need to use more copious amounts of emollients, especially after treatment, as the skin will be dry. Some people with eczema find phototherapy makes them more itchy, so using emollients for washing and bathing will help. Some phototherapy departments even advise patients to apply emollients at least 30–60 minutes prior to phototherapy treatment, particularly if the skin is dry and uncomfortable.

You may be advised to continue to use topical steroids during a course of phototherapy because of the risk of irritation and flare. If the eczema is improving, the potency of topical corticosteroids will be reduced (as flare management) and the amount or frequency may be reduced depending on the individual and their flare pattern. Topical steroids can be stopped if all eczema has cleared (though the patient will continue using emollients.)

Occasionally, small, localised areas of eczema remain – e.g. on the ankles or wrists – after a course of phototherapy and will require continued treatment with topical steroids.

Topical calcineurin inhibitors (TCIs) – e.g. Elidel and Protopic – are not used on phototherapy days, as they make the skin more sensitive to light, which may increase the risk of burning. Patients may be advised to continue with TCIs on non-treatment days.

It is important to avoid perfumes, deodorants, aftershave lotions and other cosmetics before UV treatment, as some of these products may make you more sensitive to UV light and cause patchy discolouration of the skin, which may take months to fade.

CONCLUSION

Phototherapy is an additional treatment option for people with moderate to severe atopic eczema who have discussed this option at length with their dermatologist, who will prescribe the phototherapy course. In children, the NICE guidelines recommend that phototherapy be used with caution and only for children with severe eczema, where other treatment options have failed and there is a severe negative impact of eczema on quality of life. These children are best managed in a unit where staff are experienced in the treatment of children.

There has been very little clinical research on light therapy as a treatment for eczema and it seems to work better for some people than for others. In those patients who report benefits – although long-term remission is not achieved – phototherapy does give relief of symptoms and induce a period of remission.

FURTHER INFORMATION

The British Association of Dermatologists (BAD) Phototherapy patient information leaflet. Available from: **www.bad.org.uk/site/1223/Default.aspx**