CLINICAL

INSTRUMENTS



A hot new treatment for MGD

Bill Harvey tries out a new approach to the management of meibomian gland dysfunction

ractitioners have to deal with meibomian gland dysfunction (MGD) on a daily basis. It is a major cause of evaporative dry eye symptoms and there are many approaches to its management. These range from the direct expression of meibum from blocked glands in practice, and the use of heat and pressure (typically through a mask) to soften and expel meibum, through to omega-3 supplementation and the use of a variety of drugs such as tetracyclines to reduce the bacterial load or cyclosporine to influence inflammation.

The persistent nature of the condition and the need for good compliance with the currently accepted treatment options makes MGD a stubborn problem to address. Any treatment that might be applied by a practitioner and offer a longer term solution should be viewed with interest. Intense pulsed light (IPL) therapy has been used for some years in the cosmetics industry for removal of skin lesions such as telangiectasia, port-wine stains and haemangiomas. The technique has also been used in the management of severe facial erythema in patients with acne rosacea. In these patients, it was noticed that there also appeared to be some improvement in their MGD and it is from this serendipitous finding that an IPL treatment tailored for MGD was developed.



THE E-EYE

The E-Eye (UK distributor Grafton Optical) is a desktop unit with a handheld applicator (figures 1 and 2) capable of delivering multiple homogenously sculpted light pulses to the area around the lids with a spectral range of 580 to 1,200nm. The wavelength dictates the penetration of the radiation into tissues and also the thermal energy release at the point of interest. The theory behind the E-Eye is that the high energy pulse applied to the areas around the meibomian glands stimulates the glands to function more efficiently.

The exact nature of the mechanism is not fully understood. The manufacturers explain that the pulses act upon the parasympathetic innervation (figure 3) of the glands so stimulating meibum secretion. One paper¹ conjectures that the mechanism may be more to do with causing localised thrombosis (as happens in the treatment of erythema) so reducing the accumulation of inflammatory triggers. There may also be some impact from the infrared component of the pulse affecting the mitochondria and reducing their output of reactive oxygen species.

What does seem certain – the clinical trials so far have found that the impact from a single treatment lasts far too long for it simply to be related to heating of the meibum. Furthermore, there appears to be a cumulative benefit from repeat treatments, with maximum impact achieved after three or sometimes four applications.

TREATMENTS

The E-Eye base unit comes with a replaceable pulse producing unit in the hand set (requires replacement after every 500 treatments – figure 4) and a set of patient packs (figure 5). Each patient pack includes protective goggles (for patient and practitioner), a consent form, an activation card which needs to be fitted to the main unit for the treatment course to proceed, a 'flashing intended gel' (figure 6) which acts in a similar way to the surface gel used during ultrasound, and a set of face shields. These range from small stickers to place over moles or freckles, up to large cards to place over beards (figure 7). The energy pulse from



the unit is so intense that there may be collateral injury to susceptible tissues and a beard may actually become singed.

Because of the intensity of the IPL, there are a number of questions that need to be gone through before a patient may be considered suitable for the treatment. Contraindications to the treatment include:

- History of light allergy.
- Use of photosensitising drugs.
- Facial sunburn within the last month.
- Facial skin infection.
- Use of tanning products.

Once this checklist has been gone through, the patient needs to sign the consent form. The machine is then ready to use and again offers a second safety checklist on screen (figure 8) – only when the operator confirms that all the pre-safety checks have been completed is the machine then ready to use. The pulse is produced through the end of the hand unit (figure 9) and there is a green light to indicate when it is fully charged and ready to use (figure 10).

Patient preparation is, as always, essential. Protective goggles must be worn throughout the procedure (figure 11). As treatments extend to the outer canthus, it is more convenient not to use the head strap. The contact gel must then be liberally applied (figure 12) and smoothed (figure 13) ready for the application of the pulses. The hand unit is placed in a series of locations in the sequence shown in figure 14. At each position, the trigger is pressed and the pulse of radiant energy delivered to the required location (figures 15 and 16). Most cases benefit from lower lid treatment but in a very few cases of severe MGD, upper lid treatment may be undertaken. For this, it is necessary to fit the patient with a protective shell, similar to a scleral lens, which slides under the upper lid and protects the globe.

SUCCESS

The treatment is such that 'normal meibomian gland function is resumed within a couple of hours' according to the manufacturer. Certainly, our patient confirmed an improvement in their symptoms immediately after treatment. As IPL produces a cumulative impact upon target tissues, the patient is advised of the need for three or occasionally four treatment sessions, the second after 15 days and the third after 45 days. An optional 75-day treatment might be useful in some cases.

Early indications suggest the treatment to be very effective and also reduces the impact of poor compliance. In one of the first major trials of the technique, Jennifer Craig's group found improvement after 45 days in the treatment group and suggested the E-Eye shows therapeutic potential.

Already found in a few UK practices, I suggest anyone interested in branching into dry eye management as a speciality service should take a look at the E-Eye. •

Further information at www.graftonoptical.com.

REFERENCE

1 Craig JP, Chen Y-H, Turnbull PRK. Prospective trial of intense pulsed light for the treatment of meibomian gland dysfunction. *Invest Ophthalmol Vis Sci.* 2015;56:1965–1970.