DRY EYE

What's in a drop

Bill Harvey catches up with Andrew Matheson and asks about what goes into a newly launched dry eye drop

A new dry eye drop, MeiboTears has just been launched in the UK by TLC. It forms part of an eye-care range which includes TLC lid hygiene wipes, TLC Heathy Eyes chewable orange flavoured macular supplement and MeiboClean tea tree lid hygiene foam (figure 1). These products are further complemented by the Meibo-Mask heat/cold mask. With such a range of products available, I was keen to find out what is in the new drop and why is a drop alone often insufficient in dry eye management.

FIGURE 1 The TLC family

FIGURE 4 Instillation of MeiboTears – it is important to ensure the patient is confident with instillation before leaving the practice

MEIBOTEARS

The formulation of the new drops (figure 2) includes some key components and it is important for practitioners to understand the role of ingredients in such products. They include:

FIGURE 2 MeiboTears

- Hyaluronic acid: until the late 1970s, hyaluronic acid (HA) was described as a 'goo' molecule, a ubiquitous carbohydrate polymer that is part of the extracellular matrix. It is distributed widely throughout connective, epithelial, and neural tissues and, along with lubricin, is one of the fluid's main lubricating components. For example, it is found in the synovial fluid around our joints. It is ideal for topical lubrication of the ocular surface as it boasts non-Newtonian properties and does not follow Newton's law of viscosity which predicts constant viscosity independent of stress. In non-Newtonian fluids, viscosity can change when under force to either more liquid or more solid. Ketchup, for example, becomes runnier when shaken and is thus a non-Newtonian fluid. Applied to the eye surface, HA will mimic the tear films' viscoelastic behaviour in relation to shear forces. A plant-derived alternative is hydroxypropyl-guar (HP-Guar), an ingredient that behaves like a gelling agent on contact with the tears.[1] So, HA helps to ensure reduced ocular desiccation due to the longer lasting retention time on the eye between blinks coupled with a very low shear force required on blinking giving lasting smear-free vision.
- Phospholipid liposomes: phospholipid liposomes improve the stability of the tear film lipid layer helping reduce evaporation in dry atmospheric conditions, for example in air-conditioned environments or when using computers. Matheson points out: 'We now appreciate that almost all dry eye sufferers benefit from an improved lipid layer.'[2] The purpose of thin bipolar phospholipid layer is to hold the hydrophobic meibomian oils in place overlying the aqueous layer of the tears, reducing tear break-up time and hence evaporation (figure 3). Matheson continues: 'The phospholipids in MeiboTears greatly assist in this process, by supplementing natures natural phospholipids which are often reduced in dry eye. We find patients who previously used both a conventional dry eye drop and a liposomal spray usually find MeiboTears alone more than suffices to replace the actions of both products (figure 4).'

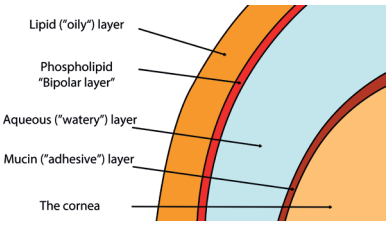

FIGURE 3 Schematic representation of the pre-ocular tear film

Other components to be aware of when reviewing a topical agent include any preservative (such as benzalkonium chloride), a buffer, to maintain constancy of pH, and ingredients affecting the tonicity of the fluid. A hypotonic drop is likely to help address raised osmolarity, a key factor in much dry eye disease. Matheson explains: 'MeiboTears is isotonic, buffered to a pH of 7.2. The preservative used is polyhexanide (often known as PHMB), which is much less irritating than the chlorhexidine, thiomerosal, benzalkonium chloride and phenoxyethanol. No components of animal origin are used.'

LID MANAGEMENT

It is important to remember that addressing dry eye usually involves more than symptomatic relief through tear replacement. For example, lid treatment may include the use of an eye mask and dedicated cleaning agents. 'I supply suitable patients with either MeiboClean tea tree lid cleaning foam or Soothing TLC lid cleaning wipes,' says Matheson. 'A hot compress before the lid hygiene using the MeiboMask makes the lid cleaning many times more effective.

'A second MeiboMask, cooled in the fridge or freezer and applied after lid hygiene, ensures that any slight swelling or bulbar redness that can sometimes occur after using a hot compress is reversed. This is important as inflammation plays an important part in the dry eye cycle. The cooled MeiboMask is also great for treating allergic chemosis.'

Andrew Matheson is a therapeutic optometrist specialising in dry eye, medical retina and glaucoma treatment in independent practice in Hampshire and director of Ocular Solutions, the wholesale division of Matheson Optometrists. He will be authoring a series on specialised optometric techniques this autumn in *Optician*.

REFERENCES

1 Purslow C. All dry eye drops are not created equal. *Optician*, 05.11.15.
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FIGURE 5 MeiboMask being worn