Clinical judgment and SICS

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Since their introduction in the late 1980s, multipurpose lens care systems (MPS) have become the first choice for contact lens care.[1] Simplicity of use is the most likely reason for their preference but that should not be the sole reason for a successful lens care system, as other important attributes are needed:

- effective against microbes
- non-toxic to user
- fast action cycle
- compatible with the corneal epithelium
- compatible with all lens materials
- establishes stable pre- and post-lens tear films
- enhances comfort: minimising lens deposition, conditioning the lens surface, and maintaining lens hydration
- inexpensive.

The challenge in delivering these attributes is that some may impact others; an increasing effectiveness against microbes may lead to an increase in epithelial toxicity. Finding this balance is a challenge for the manufacturers and we all know that every patient is different in their physiology and their use of the system.

While all of these attributes are important in a lens care system, if each of us were asked to rank them in order of preference, we would be likely to all have a different ranking. Ideally, we would agree that the MPS must maintain the lens's condition and its surface, be efficacious against microbes and not compromise the corneal epithelium.

Delivering an effective MPS has resulted in different approaches by the manufacturers and affords the optometrist a reasonable selection of products for their patients.

A practitioner must consider many aspects of lens maintenance, performance and patient comfort when determining which lens care system is best. It would be a poor clinical decision to assume or decide that MPS are all the same and simply recommend only one.

The interactivity between the lens material and surface with the MPS has given rise to much debate over the past few years. Cases in point are whether the incidence of corneal infiltrates is increasing, and the heated debate on the appearance of solution induced corneal staining (SICS).

SICS is characterised by the observation of superficial punctate staining on lens removal (**Figure 1**). The observation is optimised following two hours of lens wear.[2,3]

This was first reported by Jones and colleagues[4] and its appearance has been repeatedly demonstrated since.[5,6,7] Andrasko has the protocol for the observation of SICS optimised and described on his website (www.stainginggrid.com), along with the extent of the appearance of SICS that has been induced for most lens materials and MPS.

What is not clear is the impact of lens age on SICS. Does its appearance worsen or reduce? There is also debate on whether SICS is symptomatic or asymptomatic and whether that reflects the significance of this finding.[5,7] Some studies suggest SICS is associated with corneal inflammatory responses (infiltrates).[8,9]

There is also an alternative view on this condition, which has resulted in an alternative name, preservative associated transient hyperfluorescence or PATH.[10] This theory suggests the apparent fluorescence is due to the formation of a chemical complex between the preservative (PHMB) and sodium fluorescein.

This chemical complex wrapping around epithelial cells and giving the appearance of corneal staining is in fact not staining. The PATH theory suggests the observation you make on lens removal is an artefact of your instillation of the fluorescein.

What can we make of this situation? What should we do?

There is confusion in the literature regarding this and as a practitioner, we have to provide

Continued page 14

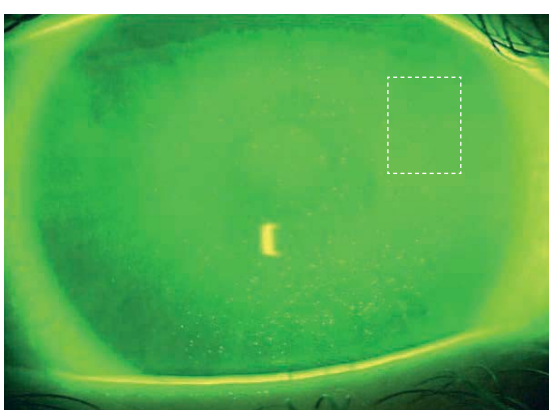

Figure 1. Solution induced corneal staining, superficial punctate staining following lens removal and instillation of sodium fluorescein
Photo: Centre for Contact Lens Research

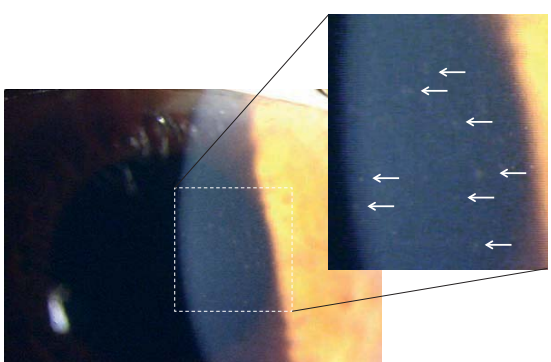

Figure 2. Solution induced corneal staining, following lens removal and prior to the instillation of sodium fluorescein
Photo: Centre for Contact Lens Research

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FROM PAGE 13

appropriate care for our patients and base these decisions on the best evidence available to us.

What is my advice? I have always set the goal of 'do no harm' to my patients and to provide them with the best care possible. This means I select the most appropriate lens material for my patient and that alone may impact my choice of MPS.

During after-care and follow-up visits, I perform a slitlamp assessment under white light with the lens removed and then with fluorescein instilled. When I observe the appearance of white specks with white light (**Figure 2**), which then appear as staining with fluorescein (**Figure 1**), I conclude that I am seeing SICS and not PATH or corneal infiltrates.

It cannot be PATH as it is observable without the aid of a diagnostic dye, neither is it an infiltrate as it is clearly of the anterior epithelium. In this situation I start looking to resolve the problem and nine times out of 10 this requires me to change the MPS rather than the lens material.

I am loath to change a lens material or design that is otherwise performing for the patient. My preference is to change the lens care system to one with demonstrated reduced likelihood of inducing SICS with that lens material.

Reviewing the literature affords us a few strategies in reducing the appearance of SICS:

- change MPS to one that has less SICS with the lens material[11] (see Andrasko staining grid, www.stainginggrid.com)
- wear the lens prior to use of the MPS[12]
- rub and rinse the lens prior to the overnight soaking period.[13]

Minimising any potential physiological compromise intuitively should lead to happier and healthier lens wear and patients.

Ensuring ocular compatibility with the lens care system as well as the lens material must surely address the primary reason for lens discontinuation, which is lens discomfort.[14]

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References available on request to r.riches@optometrists.asn.au