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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 lens materials
• compatible with the corneal epithelium
• 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 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 colleagues4 and 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 a 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.

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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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Hyaluronan in human tears before and after exposure to contact lens care solution

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Hyaluronan (HA), one of the natural lubricants of the eye, provides ocular hydration and contributes to stabilisation of precorneal tear film and has been shown to be retained and released by contact lenses.

While it has been reported that decreased HA concentrations may result from contact lens wear, the HA concentrations in tear film have not yet been evaluated after wear of contact lenses that have been soaked in a multi-purpose solution (MPS) containing HA.

This study evaluated the concentration of HA in tear film of contact lens wearers and non-contact lens wearers. It also determines if use of Biotrue Multi-purpose solution containing HA can affect the concentration of HA in tears.

Methods

Twenty-five subjects matched for age and gender (12 habitual lens wearers and 13 non-lens wearers) participated in this randomised, single-masked, contralateral study. Contact lens wearers were divided into two test groups, one wearing control lenses (sensiflcon A) rinsed with Sensitear, one wearing contact lenses (sensiflcon A) soaked overnight in Biotrue MPS for 14 hours.

Continuous variables were analysed by a linear regression model with log HA as the outcome variable. Categorial variables were analysed with a repeated measures ANOVA model with log HA as the outcome variable.

A repeated measurement ANOVA model was used to evaluate differences in HA concentrations. Comparisons with p-values ≤0.05 were considered statistically different.

Results

HA concentrations obtained in this study ranged from undetected to 3018 ng HA/ml tears which is in range with previously reported measurements.

No statistical differences in baseline HA were noted between lens wearers and non-lens wearers in this study population.

Similarly, there was no statistical difference between saline rinsed control lenses and baseline. Gender and dichotomised dry eye status were not significantly associated with HA concentration.

There was a significant negative association between age and HA concentration (the older the subject, the lower the HA concentration), with contact lens wear contributing most to this association.

An increase in HA concentration was observed in tears collected from eyes that had worn contact lenses soaked in Biotrue MPS compared to baseline (p = 0.009), and compared to those with saline rinsed control contact lenses (p = 0.031) (Figure 2).

Conclusions

This study shows that after wearing sensiflcon A contact lenses soaked in Biotrue Multi-purpose solution, an HA-containing care system, the HA concentration in tear film was significantly higher than baseline or after wearing lenses rinsed with saline. The duration of HA increase was not evaluated.

This study also suggests that there may be no significant differences in tear film HA concentration between contact lens wearers and non-contact lens wearers.

Experiencing manufacturing progression before and after computerisation was exciting and made me realise the advances that can be achieved through technology.

Implementation was challenging and information booklets were key to successful use. The need to fully understand new product features often meant considerable time was spent studying, to grasp key points and avert the risk of under- or non-use.

Customer service and technical support feedback highlighted the importance of instruction for practitioners, who might feel hesitant during busy periods to fully embrace these new technologies, perhaps dabbling in a product and not fully optimising business opportunities.

How can industry better assist end-users with information to avert such scenarios? This is a challenge being undertaken by Innovative Contacts.

Hearing orthokeratology covered in a complete range with Global OrthoK Vision (GOV) single vision, multifocal myopic and hyperopic designs, plus innovative Contacts ‘Forge’, custom sphere, toric and quadrant designs, is impressive but could be seen as daunting.

We consider it imperative to help practitioners become confident to explore more lucrative ranges, by providing technical fitment aids.

EyeSpace’ lens design software is to be launched soon, aimed at corneal topography analysis for optimum RGP simulated fitting.

Tools such as EyeSpace and a wide variety of online learning packages will help practitioners overcome many barriers.

Popular information options can include written and pictorial step-by-step guides, web links, tutorial webinars, FAQs, blogs, flow charts, workshops and customer service technical phone support.

These tools will help improve product knowledge while encouraging use, maximising initial success and giving business efficiencies to all parties with minimum patient inconvenience.

Everyone’s aim is to provide patients with leading products and services for best eye care health and comfortable lifestyle vision correction options.

Gaining business growth through technology while achieving some internet purchasing insulation is also important and can create an exciting opportunity for our great industry.

It is vital to start or modify now an existing business model for such growth, as it takes time to reposition practices faced with an increasingly competitive future.

Purchasing the latest equipment, technologies and products is all part of the business differentiation story, which if not fully embraced may result in missed opportunities.

With industry and practitioners joining forces to optimise and implement optometric advances, we can ensure personal growth and rewards while still maximising business success.

Hyaluronan in human tears before and after exposure to contact lens care solution

Hyaluronan concentrations at baseline and collected from eyes that had worn contact lenses soaked in Biotrue MPS and in saline rinsed controls

Concentration of HA in tears at baseline and collected from eyes that had worn contact lenses soaked in Biotrue MPS and in saline rinsed controls

Continuous variables were analysed by a linear regression model with log HA as the outcome variable. Categorial variables were analysed with a repeated measures ANOVA model with log HA as the outcome variable.

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Biotrue multi-purpose solution is formulated to work like the eye with the highest inspired innovations. It works like the eyes to help contact lenses stay clean and moist for all day comfort.

Synergy in optometrists and industry working together

Kendrew Smith
Director, Innovative Contacts

Clinical judgment and SICS

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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 afforded us a few strategies in reducing the appearance of SICS:

1. rinsing with Sensitive Eyes Saline
2. basepuncturing
3. application of fluorescein
4. left lens off
5. left lens on
6. adding a diagnostic dye, neither is observable without the aid of a key point and avert the risk of under- or non-use.

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