Welcome to Bausch and Lomb’s monthly research update.
With our background in clinical ophthalmic research, mainly of the anterior eye, Bausch and Lomb have asked us to produce an independent report of some of the interesting findings coming out of the research journals each month. As a busy practitioner, this should allow you to keep more up-to-date with cutting edge clinical research and allow you to locate the articles when you want to know more about a topic highlighted.

Professor James Wolffsohn is Head of Optometry at Aston University. James’ research and teaching interests mainly revolve around intraocular lenses, contact lenses, low vision and the measurement of accommodation. He has published over 100 peer reviewed academic papers, written books on Low Vision and Imaging and has given numerous international presentations. James is also a past President of the British Contact Lens Association.

Amy Sheppard is a research fellow, working with the Anterior Eye group at Aston University. Qualifying as an optometrist in 2004, Amy spent three years in full-time practice in the UK before joining Aston University’s Ophthalmic Research Group in 2007 to undertake a PhD on in vivo analysis of phakic accommodation.

Issue 10
The following key clinical peer reviewed journals will be reviewed:

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Accuracy of autorefraction following LASIK refractive surgery

This retrospective study of 250 consecutive eyes undergoing LASIK for myopia or myopic astigmatism investigated the factors that affect the accuracy of pre- and post-operative autorefractor readings. Following LASIK, autorefractometry was less accurate, compared to subjective refraction, particularly for eyes with higher levels of pre-operative myopia and/or small excimer laser optical zones. For optical zones of 5.0-5.5 mm (small), the mean difference in spherical equivalent between LASIK and subjective refraction was -0.61 DS.


Birth weight and ocular biometric measures

The Australian Twins Eye Study has examined 1498 twins aged 5-80 years and explored the association between birth weight and various ocular biometric measures. Lower birth weight was found to be associated with shorter axial lengths and more steeply curved corneas. No links between birth weight and refraction, anterior chamber depth, interpupillary distance, intraocular pressure or optic disc geometry were identified.


Subconjunctival Ranibizumab for primary pterygia: a pilot study

Mandalos et al. investigated the efficacy of a single subconjunctival injection of ranibizumab (trade name Lucentis) 0.3 mg for the treatment of pterygia. No regression of pterygium vessels or reduction in the number of vessels staining positive for VEGF A was observed following the injection, compared to untreated pterygia.

*Cornea (2010) 29: 1373-1379*
Acute anterior uveitis (AAU) recurrence related to gender and laterality

The clinical records of 207 patients with AAU associated with HLA-B27 or axial spondyloarthritis were examined in this study, to identify factors linked with a recurrence of the condition. Recurrences of AAU were found to occur most frequently in males (P = 0.03) and previously affected eyes, with 69% of subsequent episodes developing in the previously affected eye. *British Journal of Ophthalmology* (2010) 94: 1643-1647

Trends in fungal keratitis between 1999 and 2008

This retrospective study examined all cases of fungal keratitis presenting at a single institution over a 10 year time period. 78 eyes of 76 patients were examined. The main predisposing factors for fungal keratitis were contact lens use (36%), trauma (22%) and history of penetrating keratoplasty (15%). In 2005-6, approximately 40% of fungal keratitis cases were associated with soft contact lens wear, whereas in 2007-8, this had reduced to 10%. The authors attribute the rise in cases from 2004-6 to the ReNu with Moistureloc solution outbreak. *Cornea* (2010) 29: 1406-1411

High-resolution spectral domain optical coherence tomography (HR-SOCT) for the visualisation of contact lens to cornea relationships

Gonzalez-Meijome et al. describe the application of HR-SOCT for the visualisation of corneato-contact lens relationships with advanced contact lens designs (e.g. for corneal ectasia and post-refractive surgery). The authors suggest that this technology could be more widely applied to improve contact lens fitting, especially for semi-scleral lenses, RGP's and lenses for ocular pathology. *Cornea* (2010) 29: 1359-1367
Removal of biofilm from contact lens cases

This study evaluated the efficacy of different methods of contact lens case cleaning practices. Mechanical rubbing and rinsing the case with solution was the most effective method in reducing biofilm, and the authors advise that this practice should be encouraged amongst patients. Rinsing the case alone provided minimal efficacy in removing biofilm, and should be discouraged.


Effect of a new muscarinic antagonist on pupil size and accommodation

Chen et al. describe the effects of a new non-selective muscarinic antagonist, 0.05% racanisodamine, on pupil size and accommodative response in children aged 9-12 years. Objectively measured accommodative responses to near targets were unchanged following instillation of the drug, but pupil size increased significantly, reaching peak size at approximately 120 minutes post-instillation. This topically-applied drug may therefore be useful for pupillary dilation, when maintenance of normal accommodation is required.

*Optometry and Vision Science (2010) 87: 966-970*

Vitamin C and E supplementation in men, and the effect on cataractogenesis

This placebo-controlled trial tested whether long-term dietary supplementation with vitamins C and E on alternate days affected the incidence of age-related cataract amongst 11,545 healthy US males. Following a lengthy treatment period of 8 years, no beneficial or harmful effect of the supplementary regimen on the development of cataract was identified.

Mechanism of action of an ‘accommodating’ intraocular lens (IOL)

Wolffsohn et al. investigated the mechanism of action of the Tetraflex single-optic ‘accommodating’ IOL, in 13 eyes of 8 patients. Objective amplitude of accommodation was compared to changes in anterior chamber depth (anterior segment optical coherence tomography) to identify any forwards movement with ciliary muscle contraction, and aberrometry to identify any flexing of the IOL with accommodative effort. Upon accommodative effort, the implant remained in a relatively fixed position, with minimal anterior axial shift, although ocular aberrations changed with increased stimulus demand. The results suggest that near vision benefits in eyes implanted with the Tetraflex IOL are due to flexure of the implant with ciliary muscle contraction, rather than the originally proposed optic-shift principle.

*Journal of Refractive Surgery (2010) 26: 858-862*

Targeting zero post-operative spherical aberration with implantation of an aspheric IOL

Solomon describes an attempt to achieve zero post-operative spherical aberration in 40 eyes undergoing cataract surgery, using pre-operative corneal spherical aberration measures to select the most appropriate IOL design. Results were good, with minimal residual levels of spherical aberration following the surgery.


IOL stability and refractive outcomes following cataract surgery using a primary posterior continuous curvilinear capsulorhexis (PCCC)

This prospective study compared post-operative IOL position and refractive outcomes in 86 eyes treated with PCCC and 79 eyes treated for cataract without PCCC (control group). No difference was found between groups in best corrected visual acuity up to 6 months post-operatively. The control group showed significant levels of refractive shift and anterior shift of the IOL (attributable to capsular contraction) between 1 day and 6 months post-operatively, whereas no such shifts were identified in the PCCC group. PCCC could therefore be a useful procedure to limit post-operative refractive changes.

Fish/ shellfish consumption and age-related macular degeneration (AMD)

A food frequency questionnaire and retinal photography examination of over 2000 inhabitants of Salisbury (Maryland, USA) aged 65-84 years has established that those with advanced AMD (geographic atrophy or CNV) are significantly less likely to consume fish/ shellfish high in omega 3 fatty acids. Seafood high in zinc (crab and oysters) had no impact on the prevalence of AMD.

*Ophthalmology (2010) 117: 2395-2401*

MOST FASCINATING FINDING:

Kessel et al. investigated the associated between ambient (environmental) temperature, body core temperature, and corneal temperature. Human corneal temperature appeared to peak at 36.5- 37.0 degrees, with an ambient temperature of 32- 34.5 degrees. If there is a causal relationship between ambient temperature and lenticular conditions such as cataract and presbyopia, then global warming could cause an increased incidence of these complaints.

“The Relationship between Body and Ambient Temperature and Corneal Temperature.”

*Kessel et al. Investigative Ophthalmology and Visual Science 51: 6593-6597*

MOST INTRIGUING ARTICALE THIS MONTH:

“Retinal Thickness in the Offspring of Diabetic Pregnancies”


This study examined retinal thickness in children born from diabetic pregnancies, compared to a control group. Thinning of paracentral macular parameters was observed in children from diabetic pregnancies, suggesting that diabetes during pregnancy impacts on retinal development.