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.

**Issue 15**

The following key clinical peer reviewed journals will be reviewed:

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Professor James Wolfssohn 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.
Lifetime economic burden of keratoconus

In this interesting article, Rebenitsch et al. estimate the expected lifetime cost of treatment for keratoconus, compared to myopia. They included costs of clinic visits; contact lenses; fitting fees; surgical interventions and possible complications. The expected lifetime cost associated with keratoconus treatment was $25,000 ± $16,000 higher than that for myopia. The major factor influencing lifetime cost for keratoconus treatment was the probability of corneal transplant.


Prevalence and impact of ocular allergy in the UK

Over 1900 consecutive patients at optometry practices within the West Midlands were surveyed regarding ocular allergy. The mean age of the respondents was 47.7 ± 23.2 years, with 8 % reporting that they experienced ocular allergy. Ocular allergy symptoms were experienced on average for 3.4 months per year, with the peak months being June and July. Only 11% of ocular allergy sufferers consulted an optometrist for advice on their symptoms; 73 % had bought medication over the counter and 53 % had visited their GP. 83 % of the ocular allergy sufferers indicated that they would be interested in visiting a specialist clinic in ocular allergy, and would pay a mean fee of £15.50.

*Contact Lens and Anterior Eye* 2011 34(3): 133-138

Suture-related corneal infections following penetrating keratoplasty (PK)

This retrospective review examined the incidence and characteristics of suture-related corneal infections following PK. Of the 487 PK eyes included in the study, 5 developed postoperative suture-related corneal infections, giving an occurrence rate of 1%. Of these 5 eyes, 1 required a repeat PK as a result of the infection, and 2 eventually became phtisical. The mean interval between surgery and infection was 8 months. The authors state that the incidence of suture-related corneal infection may be lower than previously reported, but patients should be informed of the possible symptoms to aid early clinical recognition due to the potentially serious morbidity.

*Clinical and Experimental Optometry* 2011: 94(2) 212-218

www.academyofvisioncare.com
Simulated versus real astigmatic defocus

Arne et al. examined the effect of real and simulated (with trial lenses) spherical and astigmatic defocus on visual acuity (VA). Interestingly, real and simulated spherical defocus reduced VAs by the same amount. However, simulated astigmatic defocus reduced VA significantly more than real astigmatic defocus. The visual system appears more tolerant to “real” blur compared to simulated blur; the authors propose a range of possible explanations.

*Optometry and Vision Science* 2011 88(5): 562-569

Transient axial length increases following near work in myopes and emmetropes

Axial length is known to increase slightly with accommodation, and is thought by some to be an important factor relating to the development and progression of myopia. Here, Woodman et al. measured axial length with the IOLMaster in 20 myopes (further classified as late onset; early onset; progressing or stable) and 20 emmetropes, before and after a 30 minute reading task at 5 D accommodative demand. Transient axial length increases were observed in all groups following the reading task, with the early onset and progressing myopes exhibiting axial length changes that were significantly greater than the emmetropic group.


Face-to-face upright seated positioning for cataract surgery

Lee et al. describe a technique for cataract surgery in patients who are unable to lie flat in the conventional face-to-ceiling position. The approach involves patients being seated in a standard operating chair, elevated up to 80 degrees from horizontal, with the surgical microscope rotated 45-60 degrees to vertical, whilst the surgeon faces the patient. Clear corneal incisions are made inferiorly, temporally or infero-temporally. The authors report results of the technique in 32 eyes, and suggest it may be a suitable approach for experienced surgeons to use in patients who cannot lie flat or are unsuitable for general anaesthetic.

*Journal of Cataract and Refractive Surgery* 2011 37(5): 805-809
Pre-operative counselling on visual sensations during phacoemulsification cataract surgery

This study used a cohort of 851 patients undergoing routine cataract surgery, who were randomly assigned to receive pre-operative counselling relating to visual sensations during cataract surgery under local anaesthetic or to undergo surgery without this additional counselling. Following surgery, all patients were interviewed about their experiences, with the results showing that the mean fear score was significantly lower in the counselled group and fewer patients in this group reported being frightened during their operation.

*Journal of Cataract and Refractive Surgery 2011 37(5): 814-818*

Long-term change in corneal astigmatism following sutureless cataract surgery

Hayashi et al. compared 153 eyes that had undergone sutureless phacoemulsification cataract surgery with a horizontal incision more than 10 years ago, with an age-matched non-surgical control group of 153 eyes. Keratometric cylinder was measured at 1 year, 5 years and 10 years post-operatively after baseline. The surgical group showed a long-term against-the-rule change with increasing age, which was similar to that of the control group. The authors suggest that the post-operative against-the-rule change should be taken into consideration at the time of cataract surgery.

*American Journal of Ophthalmology 2011 151(3): 858-865*

Optimal level of anisometropia for pseudophakic monovision

Hayashi et al. investigated the optimal level of anisometropia required for successful pseudophakic monovision by simulating the effects using spherical lenses in front of the non-dominant eye in patients with monofocal IOLs. Approximately 1.50 D of anisometropia was found to be the optimal level to provide useful near visual acuity without reducing stereopsis significantly.

*Journal of Refractive Surgery 2011 27(5): 332-338*
Patient dissatisfaction following implantation of multifocal IOLs

This retrospective chart review of dissatisfied patients following multifocal IOL implantation identified that the most common symptoms were blurred vision (95% of dissatisfied patients) and photic phenomena (38%). The most significant aetiologies were residual spherical and astigmatic ametropia, posterior capsular opacification and a large pupil size. Eighty-four per cent of eyes were amenable to treatment, with only 4% of dissatisfied multifocal IOL patients requiring a lens exchange.

Journal of Cataract and Refractive Surgery 2011 37(5): 859-865

Risk factors for visual field progression in treated glaucoma

The authors examined intraocular pressure (IOP)-dependent and IOP-independent variables associated with visual field progression in 587 eyes undergoing treatment for glaucoma. Factors including age, sex, race, central corneal thickness, baseline visual field defect, mean follow-up IOP, peak IOP, IOP fluctuation and presence of a disc haemorrhage were examined in these patients, who had all undergone at least 8 visual field tests between 1999 and 2009. Older age, lower central corneal thickness, presence of a disc margin haemorrhage and all IOP variables were associated with continued visual field loss. Peak IOP was found to be a better indicator of progression than mean IOP or fluctuation.

Archives of Ophthalmology 2011 129(5): 562-568

Long-term follow up of patients implanted with I-care phakic IOLs

Sixteen patients (29 eyes) implanted between 2003 and 2006 with the I-care anterior chamber supported phakic IOL for high myopia were examined in this study. Serious corneal endothelial cell loss was observed in a number of participants, with 8 IOL explantations made due to severe endothelial cell loss between 3 and 6 years following implantation. The authors suggest that the IOL is an unsafe method for the correction of high myopia and that patients implanted should be assessed at 6-monthly intervals for endothelial cell density to be monitored.

British Journal of Ophthalmology 2011 95(5): 710-714
Ranibizumab for the treatment of choroidal neovascularisation: an optical coherence tomography (OCT) and multifocal electroretinogram (mfERG) study

Moschos et al. examined the macular function of 15 eyes using OCT and mfERG before, during and after injections of ranibizumab for choroidal neovascularisation associated with AMD. Mean visual acuity was found to significantly increase with time following treatment, whilst the foveal mfERG response also increased. Only a borderline association was found between foveal thickness assessed by OCT, and time. The authors suggest that randomised long-term clinical trials are required to evaluate the clinical benefits of ranibizumab injections for choroidal neovascularisation.

*Clinical and Experimental Optometry* 2011 94(3): 268-275

Reading rehabilitation of patients with AMD

This interesting study assessed the relative efficacy of 3 different training approaches to visual rehabilitation in 30 subjects with AMD. The results indicate that reading speed is most effectively increased in AMD patients using approaches which concentrate on eye movement control rather than techniques that train awareness of preferred retinal locus or reading without eye movement.


Effect of bevacizumab for neovascular AMD on contrast sensitivity

This double-masked study is the first to report the effects of bevacizumab therapy on contrast sensitivity. Sixty five patients with neovascular AMD received intravitreal bevacizumab, whilst 66 received standard care. The bevacizumab group showed a significant improvement in contrast sensitivity compared to the control group, in line with the improvements in visual acuity. Given the link between contrast sensitivity and visual disability, the improvement in contrast sensitivity with bevacizumab therapy is likely to have a positive impact on patient quality of life.

Most fascinating research finding this month...

Is the experience of a training ophthalmologist associated with intraoperative cataract surgery complication rates?
Alonso et al. performed a retrospective case review of 691 phacoemulsification cataract surgical procedures performed by second (228 cases) and third year (463 cases) ophthalmology residents. Comfortingly, no difference was found in the rate of intraoperative complications between second and third year residents.


Most intriguing research paper title this month...

“Thomas Young’s Investigations in Gradient-Index Optics”

Atchison and Charman evaluate Thomas Young’s work from the early 1800s on the subject of gradient refractive indices in the atmosphere and the crystalline lens. They confirm the correctness of much of his work, which was conducted over 200 years ago, well before James Clerk Maxwell described inhomogenous optical media and state that Young’s work deserves wider recognition.

Optometry and Vision Science 2011 88(5): 580-584

Next report
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