Welcome to the 25th edition of the Eye Health Research Review.

This will be my last as lead commentator as health issues have forced the decision to retire at the end of the year. I am very grateful to the guest commentators: Drs Graham Wilson and Stephen Guest for their sub-specialist editions. I have enjoyed the intellectual stimulus, but as you have probably noticed, writing does not come naturally to me.

In this edition I have taken the liberty of expanding the catchment to include some of my general medical reading, as well as revisiting some areas of particular interest to me. A new commentator will bring a new viewpoint, different interests and hopefully improved syntax, to the benefit of the publication.

If you investigate nothing else after this edition, I commend Dr Atul Gawande’s “TED” talk covering much of his “Checklist Manifesto.”

We ophthalmologists are lucky to have a fascinating, emotionally satisfying, constantly changing speciality . . . enjoy it.

I hope you find the papers in this issue useful in your practice and I welcome your comments and feedback.

Kind regards,

Dr Keith Gross
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Self-reported calcium supplementation and age-related macular degeneration

Authors: Kakigi CL et al.

Summary: These researchers analysed 2007–2008 National Health and Nutrition Examination Survey (NHANES) data from 3191 participants aged ≥40 years to examine the association between age-related macular degeneration (AMD) assessed by fundus photography and self-reported calcium supplement intake. The 248 participants (7.8%) who were diagnosed with AMD were older, on average, than those without AMD (67.2 years vs 55.8 years). In analyses adjusted for potential confounding variables, study participants who self-reported consumption of more than 800 mg daily of supplementary calcium were more likely to be diagnosed with AMD compared with those reporting no calcium supplementation (odds ratio [OR] 1.85; 95% CI, 1.25 to 2.75). The association between self-reported supplementary calcium intake and AMD was stronger in participants aged ≥68 years than in younger individuals (OR 2.63; 95% CI, 1.52 to 4.54). There was no clear dose-response association between the quintiles of self-reported supplementary calcium intake and AMD.

Comment: I almost ignored this article, given the problems with trial numbers and self-reported medication, and also the large number of recent articles proposing connections between different ophthalmic diseases and a wide range of different medications and supplements.

Coincidentally, I came across the article below, identifying for the first time tiny lumps of calcium phosphate (with cholesterol cores) lying beneath the retinal pigment epithelium in AMD (? an initiating factor) – acting as a scaffold to which proteins adhere. A promising avenue for research, possibly treatment in the future, and fitting well with the risks from high cholesterol and ? calcium supplementation.

http://www.pnas.org/content/112/5/1565.abstract?sid=592c5a84-a6b6-490f-a49d-44d170967e86

Quality of vision after bilateral multifocal intraocular lens implantation: a randomized trial - AT LISA 809M versus AcrySof ReSTOR SN6AD1

Authors: Maurino V et al.

Summary: In this study, 188 patients were randomised preoperatively to bilateral implantation with the AT LISA 809M IOL or the AcrySof ReSTOR SN6AD1 multifocal intraocular lens (IOL). Postoperative outcomes were assessed to 4 months after second eye surgery. Rasch-adjusted quality of vision (QoV) scores for frequency, severity, and bothersomeness of visual symptoms did not differ significantly between the IOL groups; median scores for these QoV subscales were 20, 22, and 14 for the AT LISA 809M IOL group, respectively, and 32, 22, and 14 for the ReSTOR SN6AD1 IOL group, respectively. Halo was the most prominent dysphotopsia symptom, with 6% in both IOL groups reporting halo symptoms as very bothersome. Complete spectacle independence was achieved in 69 of 84 (82.1%) AT LISA 809M recipients and 66 of 85 (77.6%) ReSTOR SN6AD1 recipients (p=0.37). Preferred reading distance was slightly nearer for the AT LISA 809M IOL. There were no statistically significant differences in any of the other secondary outcome measures.

Comment: A comparison of visual satisfaction with 2 leading multifocal intraocular lenses, mostly of interest for the clear reports of visual dissatisfaction with both lenses (exVioL, 23, 37–44% reported bothersome halo at 4–8 months postoperation (6% very bothersome). Whilst 80% reported independence from glasses, 25–29% reported glare as at least a little a bother, and 6% reported focusing difficulties.

A recent comparison between mini-monovision and multifocal lenses has also confirmed the greater spectacle independence of the multifocals, but in return for considerably more dysphotopsia (Labiris G et al. J Cataract Refract Surg. 2015;41(1):53-7).

The immediate problem is the level of expectation in patients buying these expensive premium lenses.

Reference: Ophthalmology. 2015;122(4):700-10

Abstract

Femtosecond laser-assisted cataract surgery versus standard phacoemulsification cataract surgery: outcomes and safety in more than 4000 cases at a single center

Authors: Abell RG et al.

Summary: In this study, 1852 eyes underwent femtosecond laser-assisted cataract surgery (study group) and 2228 eyes underwent conventional phacoemulsification cataract surgery (control group). Patient demographics were similar between groups. Vacuum/docking attempts, surface recognition adjustments, treatment, and vacuum time were significantly improved during the laser procedure in the study group.

Anterior capsule tears occurred in 1.84% of eyes in the study group and 0.22% of eyes in the control group (p<0.0001). There was no difference in the incidence of anterior capsule tears between the first and second half of laser-assisted cases. Anterior capsulotomy tags occurred in 1.62% of study group eyes. The incidence of posterior capsule tears did not differ significantly between the groups (study group: 0.43% vs control group: 0.18%). Femtosecond cataract surgery was associated with a higher incidence of posterior capsule tears did not differ significantly between the groups (study group: 0.43% vs control group: 0.18%). Femtosecond cataract surgery was associated with a higher incidence of significant intraoperative corneal haze and miosis and a significantly lower effective phacoemulsification time (p<0.001).

Comment: A summary of articles have been published recently updating the Femto vs Phaco debate. Anterior capsule tears remain a particular problem and are investigated further in a pig model (http://joeq.ee/OCN4AS). Despite a wide range of capsule strengths, the Femto capsules are on average weaker than manual capsulorhexis. This may be inherent in the posture stamp capsulorhexis process and the two articles suggest two things to me.

1) My existing cataract technique will see me out, and

2) I need to wait a few years before considering Femto cataract surgery for myself!

Would I use one, if I had access? Undoubtedly.

Do I believe it is superior? Not yet.


Abstract

Scanning ultrasound removes amyloid-β and restores memory in an Alzheimer's disease mouse model

Authors: Leinenga G, Götz J

Summary: Using a mouse model of Alzheimer's disease (AD), this article describes how repeated scanning ultrasound (SUS) treatments of the mouse brain removed amyloid-β (Aβ) peptide and restored memory function, without requiring any additional therapeutic agent such as anti-Aβ antibody. Spinning disc confocal microscopy and high-resolution three-dimensional reconstruction revealed extensive internalisation of Aβ into the lysosomes of activated microglia in mouse brains subjected to SUS, with no concomitant increase in the number of microglia. Pindic burden was reduced in SUS-treated AD mice compared with sham-treated controls, and cleaned plaques were observed in 75% of SUS-treated mice. Treated AD mice also displayed improved performance on three memory tasks: the Y-maze, the novel object recognition test, and the active place avoidance task.

Comment: A fascinating treatment for demented mice, with the potential to revolutionise the treatment of Alzheimer’s. Although I wonder which ethical committee will be the first to authorise human studies.

As a registrar in what had better be an “un-named” Eye Hospital, a “senior” consultant decided that focused ultrasound would be a good treatment for vitreous floaters. In those days you did what you were told, and there were no ethics committees. I remember the feeling of responsibility as junior staff reported burned fingers from holding this thing on eyes for 15 minutes at a time. I left before I had to work for him, and I never did hear the results of the trial!

Reference: Sci Transl Med. 2015;7(278):278ra33

Abstract

Comparison of 1-day versus 1-hour application of topical neomycin/ polymixin-B before cataract surgery

Authors: Li B et al.

Summary: This investigation compared the efficacy of two prophylactic topical antibiotic regimens before cataract surgery, both using povidone-iodine, in reducing preoperative conjunctival bacterial load. Eyes were treated with topical antibiotics and their conjunctival sac flush irrigated using 10 mL of povidone-iodine 1.0%. All eyes were randomised to receive either 4 applications of topical neomycin sulfate 3500 IU/mL plus polymixin-B sulfates 6000 IU/mL within 1 hour preoperatively (Group 1; 64 eyes) or on the day before surgery (Group 2; 69 eyes). Conjunctival specimens were obtained at 4 timepoints: (1) untreated fellow eye (control), (2) surgery eye (after antibiotic prophylaxis but before povidone-iodine irrigation), (3) after povidone-iodine, and (4) at the conclusion of surgery. The antibiotic regimens demonstrated equivalent efficacy in reducing the aerobic and microaerophilic conjunctival flora (Group 1, p=0.028; Group 2, p=0.000), but had no significant effect on anaerobic bacteria (Group 1, p=0.201; Group 2, p=0.117). Flush irrigation of the conjunctival sac using 10.0 mL povidone-iodine 1.0% significantly decreased the conjunctival bacterial load in both groups.

Comment: This article is another challenge to my ophthalmic prejudices. I have for years used 2 days of treatment with topical antibiotics (chloramphenicol) and NSAID (Acular®) before cataract surgery. The evidence has supported povidone-iodine and intracameral rather than topical antibiotics. However, most of us use topical antibiotics as well, and I have not felt that antibiotics just before surgery would have time to be effective.

I believed that I was stronger ground with Acular drops (benefits including cystoid macular oedema, peri-operative miosis, and postoperative pain). Any benefit from postoperative use in routine patients is now under challenge (Br J Ophthalmol. 2015;99(6):654-8, doi:10.1136/bjophthal-2014-305803), although other authors confirm benefit in higher-risk patients (e.g. diabetics, prostaglandin analogues users, etc.).

Three-part blog on retirement

Author: Pinto JB

Summary: This three-part blog is written by John B. Pinto, president of J. Pinto & Associates Inc., an ophthalmic practice management consulting firm in San Diego, California. Each part describes the retirement experience of an ophthalmologist and offers the reader an opportunity to reflect about the importance of preparing for retirement.

Comment: This blog series first caught my eye for the common sense: “Everything, at this stage in life, . . . depends on your partner, your health and your bank account”.

I was hooked in Part 2 by his comments on professional relationships and the generational changes he has seen. Identifying the patterns in other practices is hugely reassuring, and leads on to forgiveness of others, not so much for the others, but for one’s own benefit.

Advice on planning for retirement comes a bit late for me, but does support the path I have followed for some years, and will help others.


DO NO HARM: Stories of life, death, and brain surgery

Author: Marsh H

Summary: This leading English neurosurgeon, Henry Marsh, has written a raw and honest account of his long career.

Comment: A fascinating and occasionally disturbing look at an alternative surgical specialty where the stakes are even higher. Remarkably well written (and received) for a first book. The character and personality of the man shine through, particularly in his distress over surgical failures, his work in the Ukraine and his intolerance of hospital bureaucrats!

Film introduction: https://www.youtube.com/watch?v=1eMY2stqMr8

He was the subject of a “Your life in their hands” (2004) documentary, something I remember only too well from my mentor John Pearce’s edition in 1984.

Word of advice: you do not want the patient going on to the papers on how much better the second operation under the registrar was (lens power adjustment).


The Checklist Manifesto

Author: Gawande A

Summary: This book details the experiences of the renowned American surgeon, Atul Gawande. The main point of the book is that well-designed checklists can improve outcomes in a wide variety of fields, from medicine and disaster recovery to general practice and the military.

Comment: The author is a member of the Harvard surgical faculty, a gifted storyteller (staff writer for the New Yorker), an enquiring mind and a caring individual.

I am biased, having read his books over the years and learnt from them all (see below). I have been a reluctant convert to checklists since 2003 (and my one, and only, “Never Event” – a wrong lens implant – Royal College of Ophthalmologists Quarterly Bulletin, College News, Winter 2014, Dr M Hingorani).

The book is an enjoyable read, and the subject matter one of the greater insights in medicine in the 20th century. The initial worldwide (including Auckland) WHO trials showed reduction in complications of 35% and in mortality of 47%.


Being mortal: Medicine and what matters in the end

Author: Gawande A

Summary: This book considers how medicine can not only improve life but also the process of its ending. Gawande addresses his profession’s ultimate limitation, arguing that quality of life is the desired goal for patients and families.

Comment: It seems that no sooner do we come to terms with the mortality of our grandparents and parents, than we are forced to the first realisation of our own inevitable decline and eventual death.

As the sage said: “We are all dying”. In a surprisingly amusing read, Dr Gawande takes us through a number of possible “end games” which we will all recognise (and fear). With considerable insight, he explores “alternative pathways” and identifies what matters most ‘in the end’.

I am grateful for the opportunity, in our busy professional lives, to investigate what really matters for Sue and me.


To New Zealand health care professionals.

The Starship paediatric ophthalmology team would like your support for future studies and they are trying to raise funds.

For more information please contact Shuan Dai at shuandai@me.com

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