Abstracts

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Corneal biomechanics, thickness and optic disc morphology in children with optic disc tilt

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Central cortical thickness (CCT) may be a surrogate marker for glaucoma susceptibility. Structural changes in the optic nerve head have been shown to precede or even predict functional deficits in glaucoma, while correlations between CCT and various optic nerve head morphological parameters have been demonstrated. CCT is significantly correlated with retinal nerve fibre layer (RNFL) thickness in both normal subjects and ocular hypertensives, and a thin RNFL may predispose to glaucoma. Larger optic discs are also more susceptible to glaucomatous damage, and in a study on 212 eyes of 137 adult primary open angle glaucoma (POAC) patients described an inverse relationship between CCT and disc size. Similarly, on other study described negative correlations between CCT and disc area, rim area, rim volume and RNFL area in 208 normal adult patients. In another study it was however found that large discs were instead associated with thicker CCT in a population of 180 normal adult subjects.

The Reichert Ocular Response Analyser (ORA; Reichert Ophthalmic Instruments, Depew, New York) is a recently introduced device that measures the biomechanical properties of the cornea in vivo. The principal biomechanical parameter measured by the ORA is corneal hysteresis (CH). Low values of CH are often generally described to indicate a "soft" or "floppy" cornea-it is perhaps more accurate to say that a lower CH suggests that the viscous properties of the "visco-elastic" character are more prominent. CR is correlated with CCT, such that a thicker cornea has a larger CH, **or** greater dampening properties, and it has also been proposed that CH may likewise be a surrogate marker of glaucoma susceptibility through a relationship with the resistance of the optic nerve head to intraocular pressure (IOP) related deformation. Lower CR but not CCT was associated with visual-field progression in glaucomatous eyes.

The purpose of this study was to determine the associations between corneal biomechanical parameters as measured by the Reichert Ocular Response Analyser (ORA) and disc morphology and retinal nerve fibre layer thickness (RNFL) measured by the Heidelberg Retinal Tomograph (HAT) II in Singaporean children.

This is a cross-sectional study conducted on a subset of children enrolled in the Singapore Cohort Study of the Risk Factors of Myopia (SCORM). Corneal hysteresis (CH), corneal resistance factor (CRE) and central corneal thickness (CCT) were measured with the ORA. Optic disc morphology and ANFL thickness were assessed by the HRT II, Cycloplegic refraction and ultrasound A-scans were also performed, and disc tilt was assayed from stereo photographs.

102 subjects (mean age 12.01 (SD 0.57) years; range 11-14 years) were included in the study. The mean CH was 12.00 (1.40) mm Hg, the mean CRF was 11.99 (1.65) mm Hg, and the mean CCT was 581.12 (33.53) µm. Eyes with tilted discs had significantly longer axial lengths and more myopic refraction than eyes without tilted discs. There were no significant correlations between CH, CRF or CCT and the HAT II parameters, after the application of the Bonferroni correction. When stratified for disc tilt, however, the global disc area was significantly correlated with CCT ($r = -.49$, $p = 0.001$).

Authors concluded with the remarks that the corneal biomechanical properties as measured with the ORA do not vary with optic disc parameters or RNFL Central corneal thickness is correlated with disc area in Singaporean schoolchildren with tilled discs. This relationship may influence glaucoma risk in myopic subjects.

Correlation of lens density measured using the Pentacam Scheimpflug system with the Lens Opacities Classification System Ill grading score and visual acuity in age-related nuclear cataract

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Cataract is a major public health issue, since it is the most prevalent condition afflicting patients who attend an optometric practice; according to the World Health Organization, it is one of the principal causes of blindness worldwide. Accordingly, reliable assessment of cataract is indispensable to anyone engaged in an epidemiological study or a clinical trial. Studies of cataract classification and quantitative measurement are vital for investigating the possible risk factors of cataract formation and evaluating the performance of anti-cataract drugs. Clinically, the methods used for cataract assessment may be divided into two types, subjective and objective. The former includes the Lens Opacities Classification System (LOCS), the Wisconsin system, the Wilmer system and the Oxford system. The latter, based on Scheimpflug photography or slit-lamp imagery includes the Oxford Scheimpflug, the Topcon SL45, the Zeiss Scheimpiflug video camera and the Nidek EAS-1000" which had been used in clinical practice.

LOCS HI is well recognised as an age-related cataract grading scheme and is widely used for clinical and research study. Some studies have shown a good reproducibility with this method for cataract grading. However, it suffers, as do all other subjective assessments, from limitations rooted in observer bias and doubts concerning interobserver and intraobserver reliability.

Pentacam, a recently developed camera based on the Scheimpflug principle, captures images of the anterior eye segment in order to create a precise, three-dimensional view, and uses the digitally acquired data to evaluate the parameters of lens, cornea and anterior chamber. The purpose of this study was to investigate the relationship between lens density measured with Pentacam and LOCS III grading score as well as that between lens density and visual acuity in age-related nuclear cataract patients, with a view to evaluating the relative merits of the different approaches for the assessment of age-related nuclear cataract.

Lens density and grading score were evaluated in 138 cases (180 eyes) with age-related nuclear cataract. LogMAR visual acuity was tested with the Early Treatment Diabetic Retinopathy Study chart. The correlations between lens density value and LOCS Ill nuclear opacity (NO) and nuclear colour (NC) grading score and that between lens density value and IogMAR visual acuity were analysed.

There was a linear increasing relationship between lens density value and LOCS Ill grading score in nuclear cataract patients. Lens density value had a stronger significant correlation with LOCS Ill NO score than that with NC score. The correlation between the nuclear lens density value and logMAR visual acuity was stronger than that between NO score and logMAR visual acuity or between NC score and logMAR visual acuity.

Authors concluded with the remarks that the lens density as a quantitative and objective parameter can present the degree of NO and associated visual impairment due to nuclear cataract. The LOCS Ill criterion as an economic cataract grading system provides data that are in satisfactory concordance with the results obtained using the Pentacam Scheimpflug system.

Second-line therapy with dorzolamide / timolol or latanoprost/timolol fixed combination versus adding dorzolamide/timolol fixed combination to latanoprost monotherapy

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Latanoprost (Xalatan, Pfizer, New York) was introduced in 1996 as the first ocular $F_2\alpha$ prostaglandin analog. Because of its generally improved efficacy compared with the prior first-line medicine, rimolol maleate, this class of medicine has become a commonly prescribed monotherapy in the United States and Europe. Nonetheless, despite the superior efficacy of prostaglandins, many glaucoma patients remain incompletely controlled and may need additional therapy to further reduce the intraocular pressure (lOP). However, which medicine or preparation is best suited as second-line therapy remains controversial.

In the United States second-line therapy is not uniform, and physicians prescribed in the following order of frequency: beta-blocker (46%), prostaglandins (23%), dorzolamide/timolol fixed combination (12%), dorzolamide (11%) and brimonidine (9%).' In contrast, as a third-line therapy, *75%* of respondents prescribed the combination of a prostaglandin and the dorzolamide/timolol fixed combination.

Europe has more fixed combinations available to help simplify therapy. Consequently, second-line therapy more frequently involves changing from latanoprost to a fixed combination, which includes most commonly the dorzolamide or a prostaglandin-

based fixed combination. Unfortunately, the additional ocular hypotensive efficacy with a fixed combination, over latanoprost alone, may not be sufficient to control some patients. Consequently; the question arises: would a dorzolamide/timolol fixed combination be a more effective addition to latanoprost than changing to a fixed combination alone?

The purpose of this study was to evaluate open-angle glaucoma patients, who were insufficiently controlled on latanoprost monotherapy, to determine the 24 h intraocular pressure (lOP) efficacy and safety when changing them to dorzolamide/ timolol (DTFC) or latanoprost/timolol fixed combination (LTFC) or adding DTFC.

Consecutive adults with primary open-angle or exfoliative glaucoma who exhibit a mean baseline lOP >21 mm Hg on latanoprost monotherapy were randomised for 3 months to: DTFC, LTFC or DTFC and latanoprost. Patients were then crossed over to the next treatment for periods 2 and 3. At the end of the latanoprost run-in and after each 3-month treatment period, patients underwent 24 h lOP monitoring.

Thirty one patients completed this study. All three adjunctive therapies significantly reduced the lOP at each time point and for the mean 24 h curve, except at 18:00 and 02:00 with DTFC and 02:00 with LTFC. When the three treatments were compared directly, the DTFC and latanoprost therapy demonstrated lower lOPs versus the other treatment groups, including: the mean 24 h pressure, maximum as well as minimum levels and individual time points following a modified Bonferroni correction ($p<0.0032$).

Authors concluded with the remarks that this study showed DTFC, LTFC and the addition of DTFC to latanoprost significantly decrease the lOP compared with latanoprost alone, but the latter therapy regime yields the greatest lOP reduction.