Free Paper Abstracts

Intraocular Lens Power Calculation Using New Optical Technique

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Purpose: To evaluate the precision, reproducibility and applicability of a new optical method based on the partial coherence interferometry technique for intraocular lens (IOL) power calculation.

Methods: Prospective comparison of measurements made using the IOLMaster (Carl Zeiss) and the Ultrasonic Digital 2000 (Alcon) ultrasonic equipments during IOL calculations. Altogether 153 eyes of 80 persons (130 phakic, 2 pseudophakic and 2 aphakic eyes) were examined.

Results: The reproducibility of the IOLMaster measurements was very high: the coefficient of variation of 5 repeated measurements was 2.7% in case of axial eye length and 2.6% for anterior chamber depth. Even these values were significantly lower when measured using the IOLMaster measurements were considered in a mean of 0.01 mm for the axial length and 0.04 mm for the anterior chamber depth. The percentage error was larger and no consistent pattern was observed. The authors discuss possible reasons for the different results using the two methods and conclude that the ultrasonic measurements may be disturbed by factors not affecting the optical technique. The IOLMaster measurements could not be successfully performed in 1.9% of the axial eye length measurements, 4% of the anterior chamber depth measurements and 1% of the keratometry measurements. Major reasons for failure were axial eye length measurements were cases of posterior central cortical cataract, dense cataract, nystagmus, and high myopia.

Conclusions: The results showed that IOL calculation is easy and precise with the IOLMaster. A major advantage is that it is a non-contact method, so no anesthesia is required and there is no danger of infection.

GLUCOSE-6-PHOSPHATE DEHYDRGENASE AND CARBONIC ANHYDRASE ACTIVITY LEVELS IN ERYTHROCYTES OF CATARACTOUS PATIENTS

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Purpose: To evaluate the activity levels of glucose-6-phosphate dehydrogenase (G6PD) and carbonyl anhydride (CA) in erythrocytes of normal and cataractous patients, to look for a possible correlation between cataractogenesis and the enzyme activities.

Methods: A sample of venous blood was taken from 66 consecutive cases of idiopathic cataracts and 30 severe matched healthy controls. G6PD, CA activity levels were assessed using standard methods. The data were analyzed statistically by using standard t test for significance.

Results: G6PD activity levels were 5,63±2,37 (mean±SD) EU/gHb in the controls whereas 2,7±1,38 EU/gHb in the cataractous patients. The decrease of activity level was statistically significant [P<0.01]. CA activity levels were 244,49±25,07 (mean±SD) EU/gHb, 234,03±37,23 EU/gHb in the controls and the cataractous cases, respectively. The results did not reach statistical significance [P>0.05].

Conclusions: It is suggested that decrease of the G6PD activity in the erythrocyte which may accompany in the lens might play a role in the cataractogenesis. The insignificant decrease in CA activity does not seem to induce cataract formation.

Molecular Mechanism of Glistening Formation in Soft IOLs

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Recent years have seen a growing number of a soft intraocular lens (IOL) implanted for cataract surgery, in contrast to the conventional hard IOLs composed of glassy polymers such as poly(methyl methacrylate). The foldable AcrySof IOL having excellent optical properties allows minimal incision of the scleral surface and excellent convergence after implantation, including reduced postoperative astigmatism and inflammation. However, recent papers describe the formation of glistening in an AcrySof IOL at the early stage of implantation. The glistening is characterized by the appearance of particle-like microvacuoles distributing over the lens optics. Although glistening is considered to affect contrast sensitivity and refraction, the detailed mechanism of glistening formation has not been fully understood yet. We made an attempt at gaining deeper insights into the effect of a temperature change on the network structure and glistening formation of an AcrySof IOL. The swelling and the morphological alterations of the bulk polymer were studied as a function of temperature. In this paper, we will demonstrate that the polymer exhibits micro-phase separation upon small changes in the temperature, forming the glistening-like vacuoles distributed over the bulk polymer.

Cataract Surgery under Topical Anaesthesia: Patient Anxiety and Perception of Pain

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Objective: To study the effect of sedation during cataract surgery on patient anxiety levels and perception of pain. Design: Prospective randomised controlled study. Participants: 100 consecutive unmedicated patients undergoing cataract surgery by one experienced surgeon. Intervention: Clear corneal temporal subconjunctival infiltration was performed under topical anaesthesia. Patients were randomised to 2 groups, the first received intravenous Midazolam (0.015mg/kg body weight) and the second did not receive any sedation. Main outcome measures: Patient anxiety scores using 6-item short form of State-Trait Anxiety Inventory, pain levels using Visual Analogue Scale (0-10), and patient overall satisfaction with the operative experience (scale 0-4). Results: All operations were uncomplicated and no side effects were noted from the use of sedation. Anxiety scores were significantly higher on arrival to hospital compared to just before commencement and conclusion of surgery. (p<0.05) in either group. Patients were less anxious after administration of midazolam but this did not achieve statistical significance. Mean pain score was 0.29 (range 0-5) in the sedation group and 0.38 (0-4) in the no sedation group, this difference was not significant. Patients were equally satisfied in first [3.84, 1-4] and second group [3.88, 1-4]. Conclusions: Patient undergoing cataract surgery under topical anaesthesia are highly satisfied and report minimal perception of pain during surgery. Anxiety levels diminish after arrival to hospital possibly due to reassurance by experienced nursing staff and this seems to be also helped by intravenous sedation with midazolam.