10:30 AM 1.5 hours | Room 225 A-B
P-02 | **Papers: Ocular Disease #2**
ALCON LOGO | Moderator: Mark Dunbar, OD, FAAO

10:30 AM. **DIAGNOSIS PATTERNS AND PREVALENCE OF DIABETIC MACULAR EDEMA: RESULTS FROM THE 2005-2008 NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY** (120573)
Richard J. Madonna, MA, OD, FAAO, State University of New York (SUNY) College of Optometry, Neil Bressler, MD, Johns Hopkins University Wilmer Eye Institute, Rohit Varma, MD, MPH, University of Southern California, Quan Doan, PharmD, Michelle Gleeson, PhD, Outcomes Insights Inc.

RESULTS: 4265 subjects (weighted frequency [WF]: 94,176,420) had no diabetes; 760 (WF: 11,889,391) had diabetes without eye disease, 272 (WF: 3,735,895) had diabetic retinopathy (DR) with no DME, and 54 (WF: 560,500) had DME. 73% of subjects with DR (but not DME) and 55% with DME reported they had not been told by a doctor that diabetes had affected their eyes or that they had DR. 69% of diabetes subjects reported they had not seen a diabetes specialist in the past year and 38% reported not having a dilated eye exam in the past year. High HgbA1C (odds ratio [OR]=1.5), ≥10 yrs of diabetes (OR=10.9 vs <10 yrs of diabetes) and African-American race (OR=2.8 vs Non-Hispanic white) were associated with DME (P<0.05).
PURPOSE: To examine diagnosis patterns, prevalence, and risk factors associated with diabetic macular edema (DME) in a representative sample of the US.
METHODS: 5391 participants in the National Health and Nutritional Examination Survey (NHANES) had exams and fundus photographs from 2005-2008. Weighted frequencies and proportions were estimated, accounting for study design, sampling techniques and survey non-response. Race-specific prevalences and factors associated with DME were calculated using frequency distributions and regression analyses.
CONCLUSIONS: These data indicate that many diabetic patients may be unaware they have DR or DME. African-Americans, patients with high HgbA1C, and patients with diabetes for ≥10 yrs are at elevated risk for DR and DME. Attention should be paid to these patients to inform them of their risk of diabetic eye disease and the need for annual eye exams and appropriate follow-up for potential treatment.
ADDITIONAL COMMENTS: This study was sponsored by Genentech, Inc.

10:45 AM. **INCIDENCE OF CLINICAL & SUBCLINICAL CYSTOID MACULAR EDEMA IN DIABETIC & NON-DIABETIC PATIENTS AFTER CATARACT SURGERY BY MEANS OF OCT** (120206)
Aditi Pradeep Moghe, MOptom, United Arab Emirates

RESULTS: There was no significant change found between foveal thickness measured pre-operatively and post-operatively 1st and 4th week in diabetic and non-diabetic group but significant increase of total macular volume was found at post op 4th week when compared with baseline in non-diabetic (p=<0.001) and diabetic group (p=0.035). There was a significant co-relation found in foveal thickness and visual acuity in diabetic patients at 4th week of surgery.

PURPOSE: To evaluate the incidence of clinical and subclinical cystoid macular edema in diabetic and non-diabetic patients after phacoemulsification cataract surgery by means of Optical Coherence Tomography.
METHODS: A total of 30 eyes of 30 patients (15 diabetic and 15 non-diabetic) aged between 50 and 80 diagnosed to have cataract were enrolled. Patients were investigated for absence of any evidence of macular edema with OCT before surgery. After undergoing cataract extraction with phacoemulsification with foldable IOL implant, OCT was again carried out at post op 1st week and 4th week to know the foveal thickness and total macular volume. Similarly, the distance visual acuity was recorded at post-op 1st and 4th week on Snellen's visual acuity chart. The comparison was done between VA and OCT readings obtained in non-diabetic and diabetic patients to know the incidence of CME.
CONCLUSIONS: This study has shown a low incidence of subclinical CME following phaco-emulsification cataract surgery. OCT showed increased macular volume in both groups of patients in a small percentage of cases.
ADDITIONAL COMMENTS: I would like to acknowledge Dr. Nitin Prabhudesai (MBBS,MS,VR consultant) and all team of Bharati Vidyapeeth School Of optometry, India

11:00 AM. **ORAL CIS-RETINOID (QLT091001) IMPROVES VISION IN EARLY-ONSET RETINITIS PIGMENTOSA (RP) DUE TO RPE65 OR LRAT MUTATIONS** (120346)
Ava K. Bittner, OD, FAAO, Johns Hopkins University Wilmer Eye Institute, Anthony Moore, MD, Moorfields Eye Hospital, Eberhart Zrenner, MD, Institute for Eye Research, Samuel Jacobson, MD, PhD, University of Pennsylvania, Gerald Fishman, The Chicago Lighthouse

RESULTS: After treatment, 8 subjects (47%) had >20% improvement in GVF from baseline at 2 consecutive visits in 1 or both eyes. Average GVF area improved from baseline by 22% (p=0.03)* at day 7, 16% at day 14 (p=0.13), and 18% at day 30 (p=0.096). In an evaluable subject subset (n=14, meeting GVF test criteria), average GVF area improved from baseline by 34% at day 7 (p=0.005)*, 29% at day 14 (p=0.02)*, and 23% at day 30 (p=0.07). In 11 subjects (65%) VA improved over baseline in at least 1 eye by ≥5 ETDRS letters. Subjects self-reported improvements in areas such as night vision. QLT091001 was well-tolerated with an acceptable safety profile. [*statistically significant]
PURPOSE: To assess visual outcomes and safety after treatment with QLT091001 in subjects with early-onset RP due to mutations in RPE65 or LRAT.
METHODS: In an international, multi-center open-label Phase Ib study, 17 subjects (mean age 29 yrs) received a 40 mg/m2 dose of oral QLT091001 once daily for 7 days. Key outcome measures were Goldmann visual field (GVF) and best-corrected visual acuity (BCVA, letters), with post-treatment follow-up at 7, 14, and 30 days.
CONCLUSIONS: Early and clinically meaningful improvements in VA and GVF were observed after a single course of QLT091001. Optometrists have an important role in screening their early-onset RP patients for these mutations to identify future trial participants for important new therapies.

ADDITIONAL COMMENTS: QLT Inc. sponsored and funded the clinical study. Clinical trial registry number: clinicaltrials.gov: NCT01014052

11:15 AM. **FAST AND ACCURATE EYE TRACKING FOR OCT IMAGING** (120379)

Austin Roorda, PhD, Christy Sheehy, BS, Pavan Tiruveedhula, MS, University of California Berkeley, Kari Vienola, BS, Rotterdam Ophthalmic Institute, Qiang Yang, PhD, Montana State University

RESULTS: The stability of the OCT scanner after tracking was measured to be on a cellular scale (SD of 0.7 arcmin or ~3.5 microns). This real-time tracking enabled collection and averaging of multiple B-scans of exactly the same location. It also allowed for imaging of densely sampled large and small volumes of the retina with minimal eye motion artifacts. Finally, it enabled the recording of motion-corrected videos of a small volume of retina.

PURPOSE: To develop a system to track the eye and overcome eye motion distortions that are common to OCT and other scanning-based ophthalmic imaging modalities.

METHODS: The system integrates two custom-built instruments; a tracking scanning laser ophthalmoscope (TSLO) and a 1050 nm swept source OCT system. By analyzing the distortion of each scanned frame in the TSLO, eye motion can be tracked at rates much higher than the 30 Hz frame rate of the system. Two voltage outputs that are proportional to the horizontal and vertical eye motion signals are output and summed with the drive signals for the OCT scanners. Data collection involves (i) identifying an imaging target location with TSLO, (ii) enabling the real-time tracking, (iii) engaging the tracking outputs with the OCT system and (iv) collecting imaging data from both systems simultaneously.

CONCLUSIONS: Fast and accurate tracking of eye motion helps to overcome a major hurdle affecting the performance and utility of OCT systems. With eye tracking, the time required to acquire an image is no longer an issue, facilitating effective image averaging as well as other advanced data collection (eg phase-resolved Doppler OCT or functional imaging).

ADDITIONAL COMMENTS: Funding: NIH EY014375 (AR, PT, QY, DWA); T32 EY007043 (CW); Macula Vision Research Foundation (AR, CS); CORR (JFD); Dutch MS Foundation (JFD).

11:45 AM. **IMAGING THE RETINAL CAPILLARY LAYERS USING ADAPTIVE OPTICS** (120588)

Dean A. VanNasdale, OD, PhD, FAAO, The Ohio State University College of Optometry, Yuen Ping Toco Chui, BSc, MSc, FAAO, Stephen A. Burns, PhD, FAAO, Indiana University School of Optometry

RESULTS: Apparently complete networks can be visualized using either aperture. Optimal focusing revealed up to four capillary layers depending on the retinal location. Larger apertures allow detection of more scattered light, decreasing the contrast of high frequency, specular features such as photoreceptors & nerve fiber layer. The vessel wall & red blood cell contrast were not severely degraded with a larger aperture. This, with

the lower gain on the detector resulted in improved detectability of capillary walls & blood flow, resulting in extraction of the capillary network with as few as 14 frames of data (0.5 sec/location). A large confocal aperture could image both outer-retinal capillary layers with a single focus plane. Where the nerve fiber layer was thick it was not possible to visualize both outer and inner capillary layers with a single focal plane.
PURPOSE: To image the multilaminar retinal capillary network using adaptive optics scanning laser ophthalmoscopy (AOSLO). To determine whether capillary networks can be differentiated by acquiring through focus image series for 2 different apertures.
METHODS: High-resolution AOSLO images were acquired in 3 normal subjects at retinal locations that include an inner & outer capillary plexus. Focal depth was systematically changed to generate through focus datasets for 2 confocal aperture sizes, 100 & 500 microns (2x & 10x the Airy disc diameter respectively). For each focal plane, 50-200 images were captured at 28 Hz. Capillary networks were extracted from video sequences by computing pixelwise intensity variances among registered frames.
CONCLUSIONS: Large aperture AOSLO imaging allows rapid determination of the capillary network. Careful choice of focal planes allows multiple capillary layers to be imaged using a single plane of focus, expediting the creation capillary network maps. When information on separate layers is needed, through focus measures and use of the maximum signal allows separation of the layers.
ADDITIONAL COMMENTS: Supported by NIH grants K23-EY017886 to DAV; R01-EY14375, R01-EY04395, and P30EY019008 to SAB