

periocular tissues compares by age. We sought to characterize the OSM of the conjunctiva, eyelid margin and periocular skin in both children and adults.

**Methods:** Prospective, cross-sectional study using 16S sequencing to evaluate the OSM. Comparisons were made in bacterial yield and composition by sampling location (periocular skin, eyelid margin, or conjunctiva). 16S sequencing was performed using Illumina MiSeq 250 and analyzed using Qiime. Statistical analysis was performed using a two-sided *t* test and Monte Carlo permutations.

**Results:** Thirty patients (15 children [mean, 3.7 years], 15 adults [mean, 60.4 years]) were sampled. The periocular skin, eyelid margin and conjunctiva were all distinct in adults ( $P = 0.028$ ); however in children, no significant difference was found between periocular skin and eyelid margin or eyelid margin and ocular surface. When comparing the periocular skin microbiome in adults to children, there was a greater abundance of Firmicutes ( $P = 0.004$ ) and a lower abundance of Proteobacteria ( $P < 0.0001$ ).

**Discussion:** The microbiome of the ocular surface in children is similar to the microbiomes of the eyelid margin and periocular skin, whereas the adult OSM showed distinct compositional differences between the periocular skin, eyelid margin and conjunctiva. This finding implies that there is tutoring of the host immune system and the microbial ecosystem with aging.

**Conclusions:** Age plays an important role in the evolution of distinct microbiomes at different periocular and ocular anatomic sites.

#### 067 Utilizing optical coherence tomography for objective

**assessment of ocular torsion.** Haci Ugur Celik, Kara M. Cavuoto, Maja Kostic, Worawalun Honglerntnapakul, Craig A. McKeown, Hilda Capo

**Introduction:** To evaluate ocular torsion objectively with optical coherence tomography (OCT).

**Methods:** Patients with subjective torsion by double Maddox rod (DMR) underwent imaging with the iVue OCT device.  $6 \times 6$  scans of the optic nerve and macula of both eyes were obtained and overlaid. Objective torsion was assessed utilizing the disc-foveal angle (DFA), which was defined as the angle between a horizontal line through the disc center and the line connecting the fovea and disc center. The angle was measured with the scale option in Adobe Photoshop CS program for Macintosh. The objective torsion was analyzed using the sum and difference of the degrees of torsion in both eyes.

**Results:** Twelve patients were enrolled. The mean age was  $49.58 \pm 18.72$  years. All patients had excyclotorsion, except for one. The range, of torsion via DMR was  $7.5^\circ$  of incyclotorsion to  $40^\circ$  of excyclotorsion. The range, of torsion via DFA was  $2^\circ$  of excyclotorsion to  $45.3^\circ$ . The Wilcoxon signed-rank test found the comparison between the DMR and DFA summation was statistically significant ( $P = 0.002$ ); however there was no significant correlation between the DMR and DFA difference (Kendall's Tau = 0.188, Spearman's rank correlation = 0.238) or DMR and DFA summation (Kendall's tau = 0.326, Spearman's rank correlation = 0.452).

**Discussion:** The tendency is to measure less excyclotorsion by DMR. This may be related to the normal anatomic position of the fovea. Discrepancies between the objective and subjective torsion may be attributed to sensory adaptation and fusional amplitudes.

**Conclusions:** Initial findings suggest that utilizing the DFA may be an objective method to analyze torsion; however more data is needed for confirmation.

**068 Early recurrence of retinopathy of prematurity after initial intravitreal ranibizumab monotherapy—experience from a tertiary referral center in Abu Dhabi, UAE.** Tin T. Chan, Abeer A. Al Ali, Ahmed A. ElBarky, Fiona F. Dean, Fatima F. Habroosh, Manal M. Alzaabi, Rawdha R. Al Nuaimi

**Introduction:** To evaluate recurrence rate of retinopathy of prematurity (ROP) after initial intravitreal ranibizumab injection (IVR) monotherapy for infants with type 1 retinopathy of prematurity (zone I and posterior zone II) and threshold disease.

**Methods:** A retrospective study of electronic medical files was performed on 38 infants (75 eyes) seen between May 2013 to July 2017. They received initial intravitreal ranibizumab monotherapy (IVR) only for type 1 or threshold disease retinopathy of prematurity (ROP). All babies received 0.25mg/0.025ml (IVR) 1.75 to 2.00 mm posterior to the limbus.

**Results:** Success rate, measured by ROP resolution post-initial IVR injection monotherapy was 61.3 % (46/75 eyes) in 23 infants, whereas 38.7 % (29/75 eyes) of 15 infants had an early recurrence. The early (first) recurrence occurred 5-8 weeks post initial monotherapy of IVR injection (mean, 7 weeks). The second recurrence in 4/15 eyes was 1-8 weeks post-treatment (mean, 4.2 weeks) and 1 eye had third recurrence 8 weeks post-treatment. Mean follow-up was 12 months post IVR.

**Discussion:** Early recurrence after initial injection occurs in 38.7 % of infants and the mean onset of recurrence is 7 weeks. None of the infants developed recurrence after 52 post menstrual age (PMA). Recurrence with intravitreal bevacizumab injection is reported to occur at 16 weeks or later but in our study using intravitreal ranibizumab monotherapy, recurrence of ROP occurred earlier.

**Conclusions:** We highly recommend a stringent follow-up protocol to look for recurrences post IVR injection, especially in the initial 3-month period.

**069 Ophthalmologic disorders and risk factors in children with autism spectrum disorder (ASD).** Melinda Y. Chang, Nandini Gandhi, Mary O'Hara

**Introduction:** Autism spectrum disorder (ASD) is increasingly prevalent, estimated to occur in 1.68% of children in the United States. Little is known about the risk factors and types of ophthalmologic disorders in this population.

**Methods:** We conducted a retrospective chart review of all children (0-17 years old) with an ICD diagnosis of ASD seen at a single university over a 10-year period (2007-2017). In patients evaluated at the university eye clinic, demographic data, birth history, co-morbidities, and ophthalmologic findings were recorded. Multiple logistic regression was used to identify risk factors for ophthalmologic disorders.

**Results:** 2,555 children with ASD were seen at the university during this time period, and 380 (15%) were evaluated in the ophthalmology clinic. Eye exam revealed an ophthalmic diagnosis in 71% of children, of which the most common were significant refractive error (42%), strabismus (32%), and amblyopia (22%). Optic neuropathy occurred in 14 (4%) children. Cerebral palsy (CP) was a significant risk factor for refractive error (OR 3.22;  $P = 0.016$ ), strabismus (OR 3.59;  $P = 0.012$ ), amblyopia (OR 3.49;  $p = 0.0097$ ), and optic neuropathy (OR 14.0;  $P = 0.0009$ ).

**Discussion:** Ophthalmic disorders occurred in 71% of children with ASD, and the rates of significant refractive error, amblyopia, strabismus, and optic neuropathy exceeded those of the general pediatric population. ASD and CP may have additive risk for the aforementioned disorders.