

Posterboard#: A0443

Abstract Number: 5143 - A0443

AuthorBlock: *Yanhui Ma¹, Sunny Kwok², Jun Liu^{2,1}, Sayoko E. Moroi¹*

¹Department of Ophthalmology and Visual Sciences, The Ohio State University, Columbus, Ohio, United States; ²Department of Biomedical Engineering, The Ohio State University, Columbus, Ohio, United States;

DisclosureBlock: Yanhui Ma, None; Sunny Kwok, None; Jun Liu, None; Sayoko E. Moroi, None;

Purpose

Intraocular pressure (IOP) is determined by aqueous humor dynamics (AHD) with the variables of aqueous humor flow, episcleral venous pressure, outflow facility through the trabecular meshwork, and uveoscleral flow. Among these variables, all but uveoscleral flow can be measured. Our purpose is to characterize uveoscleral flow from ultrasound biomicroscopy (UBM) by analyzing pixel intensity distributions in the anterior perilimbal sclera and ciliary body.

Methods

Subjects with ocular hypertension or open-angle glaucoma were enrolled. A standardized UBM protocol was established to acquire longitudinal images at nasal and temporal meridians with a 50 MHz probe (Quantel Medical) in supine position under topical anesthesia. Using B-mode images, the anterior sclera and ciliary body were manually segmented. Pixel intensity gradient along the central A-line was analyzed to delineate the intensity change at the transition band from sclera to ciliary body using custom algorithms. The average pixel intensity values within the ciliary body and anterior sclera regions were assessed, and the ratio between them was calculated. As part of the AHD protocol, IOP was measured using Ocular Response Analyzer.

Results

Three subjects were imaged at baseline and two (#1 and #3, Table 1) were imaged again after one-week daily nighttime treatment with latanoprost 0.005% (Greenstone LLC). The intensity gradient plot along the central A-line showed a dip in the curve at the sclera-ciliary body transition zone (Fig.1). Ratios between the average pixel intensity in the ciliary body and the average pixel intensity in the anterior sclera under baseline conditions were 0.78, 0.78, and 0.85. With latanoprost treatment, there was an increase in the

pixel intensity ratio (0.81 and 0.96) on the repeated UBM images of subjects #1 and #3, and their respective IOP reduction was 20% and 24%.

Conclusions

Our preliminary results show promise to develop a semi-quantitative method to assess uveoscleral flow from UBM images. With additional subjects, we anticipate the ability to determine if this proof-of-concept approach demonstrates a correlation between IOP reduction from latanoprost and an increase in the pixel intensity ratio of the ciliary body to anterior sclera regions.