**Longitudinal Analysis of Structural and Functional Glaucoma Progression**

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**Hypothesis:**

Structural change including different generation of OCT (Prototype, OCT1/2, Stratus and Cirrus) and CSLO (HRT) is earlier than functional change for longitudinal glaucomatous progression.

**What are we concerned about in this study?**

1. The description and trend analysis of different parameters during follow up in different groups, including glaucoma, glaucoma suspect and normal subjects.
2. What is the association between functional and structural changes of glaucoma progression in long term follow up.
3. What is the agreement between functional and structural changes with the time progressed.
4. Trend analysis of different parameters during glaucoma progression compared with age-related group (Igor’s normal patients dataset).

**Subjects:**

126 subjects (229 eyes)

**Study Design:**

Prospective Longitudinal

**Statistical Model:**

Linear mixed-effects model adjusting for baseline age and signal to noise ratio (snr) /signal strength (SS)   
**subject, daysfrombaseline, Dx,   
vf, VFI  
oct\_prototype, oct\_1\_2, oct\_stratus, oct\_cirrus,   
mean\_rnfl\_stratus, mean\_rnfl\_cirrus  
mean\_rnfl\_prototype, mean\_rnfl\_oct\_1\_2**

|  |  |
| --- | --- |
| subject | Patients ID number |
| daysfrombaseline | Days from baseline |
| Dx | Diagnosis (n-normal; g-glaucoma; gs-glaucoma suspect) |
| vf | Indicates presence or absence of VF data (0-absence; 1-qualified; 2-disqualified) |
| oct\_prototype | Indicates presence or absence of Prototype OCT data (0-absence; 1-qualified; 2-disqualified) |
| oct\_1\_2 | Indicates presence or absence of OCT 1/2 data (0-absence; 1-qualified; 2-disqualified) |
| oct\_stratus | Indicates presence or absence of Stratus OCT data (0-absence; 1-qualified; 2-disqualified) |
| oct\_cirrus | Indicates presence or absence of Cirrus OCT data (0-absence; 1-qualified; 2-disqualified) |
| MD | Mean deviation |
| PSD | Pattern standard deviation |
| VFI | Visual field index |
| mean\_rnfl\_prototype | Mean RNFL thickness of Prototype OCT |
| mean\_rnfl\_oct\_1\_2 | Mean RNFL thickness of OCT 1/2 |
| mean\_rnfl\_stratus | Mean RNFL thickness of Stratus OCT |
| mean\_rnfl\_cirrus | Mean RNFL thickness of Cirrus OCT |
| rimareamm2\_hrt\_stereo | Rim Area (mm2) |
| cupdiscarearatio\_hrt\_stereo | Cup/Disc Area Ratio |
| cupshapemeasure\_hrt\_stereo | Cup Shape Measure |

**Variable Key:**

|  |  |
| --- | --- |
| subject | Patients ID number |
| gender | M-male; F-female |
| DOB | Date of Birth |
| Age | Age (years) |
| baselinevisit | Baseline visit date |
| visitdate | Visit date |
| eye | OD-right; OS-left |
| daysfrombaseline | Days from baseline |
| yrsfrombaseline | Years from baseline |
| cataract\_surgery | Cataract surgery record (0-before surg; 1-after surg; 2-the history is not sure, but is consistent during f/u period with either surgery or not) |
| Dx | Diagnosis (n-normal; g-glaucoma; gs-glaucoma suspect) |
| VA | Best corrected visual acuity |
| sph\_eq | Spherical Equivalent of refractive error |
| vf | Indicates presence or absence of VF data (0-absence; 1-qualified; 2-disqualified) |
| oct\_prototype | Indicates presence or absence of Prototype OCT data (0-absence; 1-qualified; 2-disqualified) |
| oct\_1\_2 | Indicates presence or absence of OCT 1/2 data (0-absence; 1-qualified; 2-disqualified) |
| oct\_stratus | Indicates presence or absence of Stratus OCT data (0-absence; 1-qualified; 2-disqualified) |
| oct\_cirrus | Indicates presence or absence of Cirrus OCT data (0-absence; 1-qualified; 2-disqualified) |
| hrt\_stereo | Indicates presence or absence of HRT Stereo data (0-absence; 1-qualified) |
| hrt\_GPS | Indicates presence or absence of HRT GPS data (0-absence; 1-qualified) |
| qualified\_for\_GPA | # 1 means they have at least 5 overlapped VF and OCT, which is qualified for GPA data collection |
| MD | Mean deviation |
| PSD | Pattern standard deviation |
| GHT | Glaucoma hemifield test   1. within normal limit 2. borderline 3. outside normal limit 4. general reduction of sensitivity 5. abnormally high sensitivity 6. borderline/general reduction |
| VFI | Visual field index |
| snr\_prototype | Signal to noise ratio of Prototype OCT |
| mean\_rnfl\_prototype | Mean RNFL thickness of Prototype OCT |
| superior\_prototype | Superior quadrant RNFL thickness of Prototype OCT |
| nasal\_prototype | Nasal quadrant RNFL thickness of Prototype OCT |
| inferior\_prototype | Inferior quadrant RNFL thickness of Prototype OCT |
| temporal\_prototype | Temporal quadrant RNFL thickness of Prototype OCT |
| snr\_oct\_1\_2 | Signal to noise ratio of OCT 1/2 |
| mean\_rnfl\_oct\_1\_2 | Mean RNFL thickness of OCT 1/2 |
| superior\_oct\_1\_2 | Superior quadrant RNFL thickness of OCT 1/2 |
| nasal\_oct\_1\_2 | Nasal quadrant RNFL thickness of OCT 1/2 |
| inferior\_oct\_1\_2 | Inferior quadrant RNFL thickness of OCT 1/2 |
| temporal\_oct\_1\_2 | Temporal quadrant RNFL thickness of OCT 1/2 |
| ss\_stratus | Signal strength of Stratus OCT |
| mean\_rnfl\_stratus | Mean RNFL thickness of Stratus OCT |
| superior\_stratus | Superior quadrant RNFL thickness of Stratus OCT |
| nasal\_stratus | Nasal quadrant RNFL thickness of Stratus OCT |
| inferior\_stratus | Inferior quadrant RNFL thickness of Stratus OCT |
| temporal\_stratus | Temporal quadrant RNFL thickness of Stratus OCT |
| ss\_cirrus | Signal strength of Cirrus OCT |
| mean\_rnfl\_cirrus | Mean RNFL thickness of Cirrus OCT |
| superior\_cirrus | Superior quadrant RNFL thickness of Cirrus OCT |
| nasal\_cirrus | Nasal quadrant RNFL thickness of Cirrus OCT |
| inferior\_cirrus | Inferior quadrant RNFL thickness of Cirrus OCT |
| temporal\_cirrus | Temporal quadrant RNFL thickness of Cirrus OCT |
| rimareamm2\_hrt\_stereo | Rim Area (mm2) |
| cupdiscarearatio\_hrt\_stereo | Cup/Disc Area Ratio |
| cupshapemeasure\_hrt\_stereo | Cup Shape Measure |
| Glaucomaprobability\_hrt\_GPS | Global glaucoma probability score |
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