Pre- and Post-POAG Rates of Visual Field Progression in the Ocular Hypertension Treatment Study (OHTS)

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Purpose

To compare the rate of visual field (VF) loss (mean deviation dB/year) before and after POAG diagnosis.

Methods

Participants

- 282 participants developed POAG in OHTS 1 and 2.
- VF tests (HFA 30-2 and 24-2 test strategies) were completed every 6 months for ≈12 years in OHTS 1 and OHTS 2 (1994-2008).
- VF tests (24-2) were completed at 20-year visit in OHTS 3 (2016-2022).

Diagnosis of POAG

- Reproducible optic disc deterioration and/or VF abnormality as determined by masked readers in the Reading Centers.
- Attribution of change to POAG by a masked Endpoint Committee.

Statistical Analyses

- At least 5 VFs over at least 3 years prior to or after POAG were required to calculate slope coefficient for mean deviation (dB/yr).
- At least 6 VFs over 6 years were required to calculate MD dB/yr for participants who did not develop POAG.
- Slope coefficients were calculated for each eye separately by simple linear regression.

Results

Table 1. Eyes that developed POAG and subset of eyes with 5 or more VFs over 3 yrs for calculation of pre and/or post-POAG MD slopes

	Eyes that developed Optic Disc POAG only	Eyes that developed VF POAG with/without optic disc POAG	All POAG eyes
N of eyes	155	214	369
N of eyes ≥ 5 VFs for ≥ 3 years prior to POAG	151	186	337
N of eyes ≥ 5 VFs for ≥ 3 years after POAG	112	168	280

Figure 1. Spaghetti plot of mean deviation (dB) from baseline to last VF in eyes that developed VF POAG shows marked variability in trajectory.

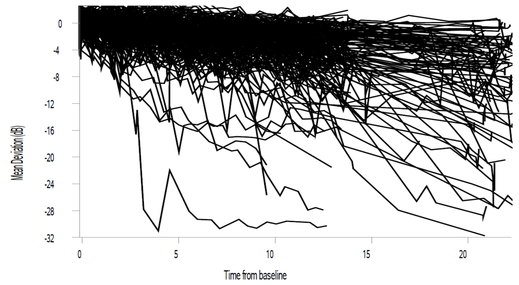


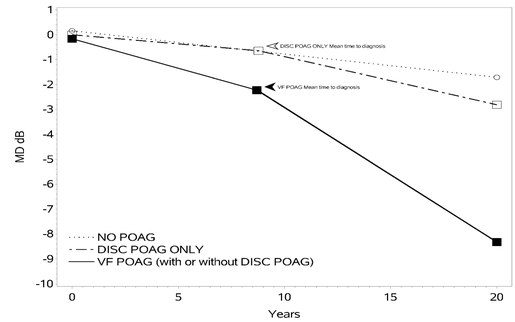
Table 2. MD slope (dB/yr) from baseline to POAG diagnosis and from POAG diagnosis to last VF test.

	Pre-POAG Slope Mean MD dB/year				Post-POAG Slope Mean MD dB/year				
	N Eyes	Visual Fields per eye Mean (SD)	Slope MD dB/year Mean (SD)	Years Baseline to POAG (SD)	N Eyes	Visual Fields per eye Mean (SD)	Slope MD dB/year Mean (SD)	Years POAG to last visit (SD)	P-value for difference between pre- and post-POAG slopes
Disc POAG without VF POAG	151	16.0 (5.8)	-0.07 (0.2)	8.1 (3.1)	112	11.4 (5.4)	-0.19 (0.4)	8.5 (4.7)	0.0008
VF POAG with or without Disc POAG	186	15.7 (6.1)	-0.24 (0.3)	7.9 (3.1)	168	12.4 (6.0)	-0.54 (0.7)	9.2 (4.9)	0.0001
All POAG	337	15.8 (6.0)	-0.16 (0.3)	8.0 (3.1)	280	12.1 (5.8)	-0.40 (0.6)	8.9 (4.8)	0.0001

Post-POAG MD slopes in eyes that developed VF POAG (n=168) shows 41% "rapid progression".

• Worse than or equal to -0.5 dB/yr	69	41%
• Worse than or equal to -1.0 dB/yr	35	21%
• Worse than or equal to -2.0 dB/yr	9	5.4%

Figure 2. Schematic of predicted mean MD slope (dB/yr) projected from baseline to 20 yrs.



Conclusions

- Among eyes that developed POAG, the rate of change in MD dB/year increased substantially after the diagnosis of POAG.
- The slope of VF loss after the diagnosis of POAG appeared linear through 20 years.

Limitations

- Follow-up between OHTS 2 and 3 discontinued
- Focal changes in VF were not analyzed
- OCT not performed until OHTS 3

Commercial Relationships: Gordon, **Mae** None; **Huecker, Julia** None; **Brandt, James** None; **Heuer, Dale** None; **Higginbotham, Eve** None; **Parrish II, Richard** None; **Johnson, Chris** None; **Keltner, John** None; **Kass, Michael** None.

Support: Supported by NEI (R34 EY023633) and unrestricted grant from RPB.

Supported By Research to Prevent Blindness

National Eye Institute, National Institutes of Health