Appraisal of HD-OCT guided progression analysis parameters detecting glaucomatous progression
Sebastián Banegas-Argota, Alfonso Antón-Lopez, Antonio Morilla-Grasa, Marco Bogado, Javier Moreno-Montañas

1Institut Catalá de Retina, Barcelona - Spain, 2Clínica Universidad de Navarra, Pamplona - Spain

Purpose: To appraise performance and diagnostic agreement for detection of glaucomatous progression of HD-OCT Guided Progression Analysis (GPA) parameters with HFA II GPA and expert assessment of optic disc stereophotographs.

Methods: Observational cohort study that included 166 eyes from 103 individuals followed for an average of 29.36 ± 8 months. At baseline, 37.3% of the eyes were classified as glaucomatous, 59.1% of the eyes were classified as suspects, and 3.6% as healthy eyes. Eyes with any other ocular disease except for mild cataract were excluded. Images were obtained every 6 to 12 month with Cirrus Optic Disc Cube algorithm 200x200, along with the optic disc stereophotographs and standard automated perimetry visual fields (VF). Progression was determined in (VF) with HFA GPA II software, in OCT images with GPA and by masked assessment of optic disc stereophotographs by expert graders. Main outcome measures were sensitivity, specificity, likelihood ratio of positive test result (LR+), likelihood ratio of negative test result (LR-) and area under the receiver operating characteristic curve (AROC) for detection of glaucoma progression using OCT’s GPA and HFA II GPA. The assessment of optic disc stereophotographs was used as reference standard. Agreement among the different methods was reported using the Kappa coefficient (K), PABAK (prevalence-adjusted bias-adjusted kappa) and GWET’S AC1, overall percentage agreement (OPA), percentage of positive agreement (Ppos), percentage of negative agreement (Pneg) between optic disc photographs and OCT and VF were calculated.
**Results:** Progression by stereophotographs during the follow-up period was found in 7 of the 166 eyes (4.2%). OCT’s GPA Thickness Map parameter detected 3 of these eyes obtaining the highest sensitivity (42.9%) followed by VF GPA event parameter (VFeV) with 28.6%. The highest specificity was found with Superior Thickness and Inferior Thickness, obtaining 96.2% and 95% respectively. Both HFA II GPA parameters obtained a specificity of 89.9%. The larger AROC calculated, (0.593) was for VFeV, followed by Map Thickness with 0.592. The highest LR+ (2.8) was obtained with VFeV and Inf.thickness, while the lowest LR- values (0.8) were computed with VFeV and Thickness Map. (K) between stereophotographs and OCT and VF was low with values of 0.04 and 0.05 respectively. PABAK, GWET AC1, OPA and Pneg reflected better agreement between stereophotographs and OCT parameters than by photos-VF parameters. Ppos outcomes were higher with VFeV than photos. VFeV showed better agreement with OCT’s than VFtrend parameter.

**Conclusion:** OCT parameters differ in diagnostic agreement and performance for detection of progression, these disparities should be consider when analyzing OCT scans. In most agreement measures, better outcomes were obtained between OCT GPA parameters and expert-assessed of optic disc stereophotographs than between OCT and VF GPA parameters or VF parameters and stereophotos.