Medical Retina

RETINAL PIGMENT EPITHELIUM – BRUCH´S MEMBRANE COMPLEX VOLUME ANALYSIS, A ROLE IN COMPLEMENTING FUNDUS PHOTOGRAPH-BASED AMD GRADING OF AGE-RELATED MACULAR DEGENERATION

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BACKGROUND AND OBJECTIVE: To assess the agreement of OCT algorithm-based Retinal pigment epithelium – Bruch´s membrane complex volume (RBV) with fundus photograph-based Age-related macular degeneration (AMD) grading.

PATIENTS AND METHODS: Digital color fundus photographs (CFP) and spectral domain optical coherence tomography (SD-OCT) images were acquired from 96 elderly subjects. CFPs were graded according to Age-Related Eye Disease Study (AREDS) classification. SD-OCT image segmentation and RBV data calculation were done with Orion^{TM} software. Univariate and multivariate analyses were performed to find out whether AMD lesion features associated with higher RBVs.

RESULTS: RBV correlated with AMD grading (rs 0.338, p=0.001), the correlation was slightly stronger in eyes with early AMD (n=52) [rs 0.432, p=0.001]. RBV was higher in subjects with early AMD compared with those with no AMD lesions evident in fundus photographs (1.05±0.20 vs. 0.96±0.13 mm3, p=0.023). Late AMD eyes showed a decrease in RBV values. In multivariate analysis higher RBVs were associated with total drusen area and pigmentation in fundus photographs, whereas depigmentation was associated with lower RBV.

DISCUSSION: RBV correlate with AMD grading status. This association is strongest in patients with moderate, non-late AMD grades. RBV is more comprehensive measurement of the key area of AMD pathogenesis, compared to sole drusen volume analysis. RBV measurements were independent on grader variations, and in patients with drusen and pigmentation, but no depigmentation, the RBV could be used as an independent tool to quantify early AMD lesion volumes independently of a human observer bias.