COMPARISON OF SHORT-WAVELENGTH BLUE-LIGHT AUTOFLUORESCENCE AND CONVENTIONAL BLUE-LIGHT AUTOFLUORESCENCE IN GEOGRAPHIC ATROPHY


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Purpose: To systematically compare the intermodality and interreader agreement for two blue-light confocal fundus autofluorescence (FAF) systems. Methods: Thirty eyes (21 patients) with a diagnosis of geographic atrophy (GA) were enrolled. Eyes were imaged using two confocal blue-light FAF devices: (i) Spectralis device with a 488 nm illumination wavelength (488-FAF); (ii) EIDON device with 450 nm excitation wavelength and the capability for "color" FAF imaging including both the individual red and green components of the emission spectrum. Furthermore, a third imaging modality (REFC-450-FAF image) isolating and highlighting the red emission fluorescence component (REFC) was obtained and graded. Results: The 95% coefficient of variability (CR; 1.35 mm² for the 488-FAF-based grading, 8.13 mm² for the 450-FAF-based grading, and 1.08 mm² for the REFC-450-FAF-based grading), the coefficient of variation (CV; 1.11 for 488-FAF, 2.05 for 450-FAF, 0.92 for REFC-450-FAF) and the intraclass correlation coefficient (ICC; 0.994 for 488-FAF, 0.711 for 450-FAF, 0.997 for REFC-450-FAF) indicated that 450-FAF- and REFC-450-based grading have the lowest and highest interreader agreements, respectively. The GA area was larger for 488-FAF images [median (IQR): 2.1 mm² (0.8-6.4 mm²)] than for 450-FAF images [median (IQR): 1.0 mm² (0.3-4.3 mm²); p=0.0001]. There was no significant difference in lesion area measurement between 488-FAF- and REFC-450-FAF-based grading (median (IQR): 2.6 mm² (0.8-6.8 mm²); p=1.0). Conclusions: The increased excitation of short-wavelength GEFC-emitting fluorophores may alter the reliability of the 450-FAF to detect the GA. However, the isolation of the REFC from the 450-FAF images allowed for an accurate and reproducible quantification of GA. Financial Disclosure: E. Borrelli: none; M.G. Nittala: none; N.S. Abdelfattah: none J. Lei: none; A.H. Hariri: none; F. Wenying: none; M. Cozzi: none; V. Sarao: none; P. Lanzetta: Financial support – Bayer, Centervue, Genentech, Novartis, Roche; G. Staurenghi: Financial support – Novartis, Alcon, Bayer, Allergan, Boehringer Ingelheim, Genentech, Roche, Zeiss Meditec, Heidelberg Engineering, Optos, Centervue; S.R. Sadda: Financial support – Allergan, Centervue, Carl Zeiss Meditec, Genentech, Iconic, Novartis, Optos, Optovue, Regeneron, Thrombogenics.