Purpose: To compare the morphological neovascular network changes after anti-vascular endothelial growth factor (anti-VEGF) therapy in treatment-naive and treated patients with age-related macular degeneration (AMD), by means of optical coherence tomography angiography (OCTA).

Methods: Consecutive patients with neovascular AMD underwent multimodal imaging, including OCTA (AngioPlex, CIRRUS HD-OCT model 5000; Carl Zeiss Meditec, Inc, Dublin, OH) at baseline and in the three following months. Treatment naive AMD patients undergoing anti-VEGF induction phase were included in Group A, while previously treated patients were included in Group B. Two independent masked readers performed a qualitative and quantitative assessment. Qualitative analysis of OCTA choriocapillaris images at baseline and at each follow up visit consisted in morphological criteria from recent literature: visualization of a high flow network, of a feeder vessel, small ramifications, large vessels, anastomotic arcade, as well as the presence of a dark halo. Quantitative analysis of CNV size was performed on the same segmentation, using a free image analysis software (Image J, open-source Imaging Processing software, 2.0.0-rc-43/1.51K).

OCTA changes were then correlated with best-corrected visual acuity (BCVA) and exudation signs on structural spectral domain (SD-OCT). Inter-reader agreement was also investigated.

Results: Twenty-five eyes of twenty-four patients were enrolled: 13 eyes of AMD treatment-naive patients and 12 eyes of AMD patients treated by anti-VEGF therapy were included (mean age 78.91). Mean follow-up was of 3 ± 1 months. Baseline overall BVCA was 62.66 letters (Snellen equivalent = 20/50).

Qualitative analysis. At each visit a high flow network in the choriocapillaris segmentation was visualized in all cases (25/25). None of the morphological criteria (listed above) did change in a statistically significant manner in either group during follow up (p>0.12 and 1)

Quantitative analysis. Group A showed a statistically significant decrease in lesion area (p=) from baseline to month 3. Conversely, in group B no significant change in lesion area was observed during anti-VEGF therapy. Moreover, a slight increase of lesion area in group B was noted, which was not always associated with persisted of exudative signs on SD-OCT.

Conclusion: Qualitative OCTA analysis of anti-VEGF treatment-response in patients during the loading phase versus previously treated patients and followed according to a PRN regimen shows individual morphological changes, which do not differ statistically in the two categories. Quantitative OCTA analysis does however provide interesting insights on the therapeutic response in immature, versus mature, neovascular membranes.

References:

The authors have no financial disclosures.