

Chorioretinal thickness tracks disease activity in clinical ANCA vasculitis

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Background

ANCA-associated vasculitis (AAV) is a systemic inflammatory disease characterised by autoimmune-mediated injury of small blood vessels. A non-invasive means of detecting this microvascular injury would be of major clinical value. The eye can act as a window to the systemic microvasculature. Retinal optical coherence tomography (OCT) provides cross-sectional imaging of the retina and highly vascularised choroid with near-histological resolution. Histology shows that choroidal thinning is due to microvascular rarefaction. We have shown that systemic inflammation associates with choroidal thinning in chronic kidney disease.¹ We hypothesised that OCT metrics would reflect disease activity in AAV and be modified with treatment.

Methods

We prospectively recruited 40 patients with active AAV and 40 age- and sex-matched healthy volunteers. We excluded participants with diabetes, previous eye disease or eye surgery. AAV patients were studied prior to receiving immunosuppressive treatment and again in disease remission, defined by a Birmingham Vasculitis Activity Score (BVAS) of 0 for a least 2 months whilst on low dose steroid. Healthy volunteers underwent a single scan at baseline. All subjects underwent imaging with the Heidelberg SPECTRALIS® Spectral-Domain OCT device. Choroidal thickness was measured by a masked operator at 2mm nasal to fovea (location I), sub-foveal (location II) and 2mm temporal to the fovea (location III), figure 1.

Results

AAV patients had a mean (+/-SD) age of 60±14 years, 20 (50%) were male and 24 (60%) were PR3+. Median (range) BVAS at entry was 13 (3-21). 30 (75%) patients were new presentations and 26 (65%) had renal involvement. Mean (±SD) choroidal thickness was thinner in active AAV patients compared to health: location I 202±84 vs. 248±76µm; location II 279±90 vs. 331±69µm; location III 276±90 vs. 309±65µm; all p<0.05. Choroidal thickness correlated negatively with baseline BVAS, r=0.57, p<0.05. Following disease remission, choroidal thickness increased by ~10% compared to active disease, p<0.01 at all three locations, Figure 1.

Conclusions

Active AAV is associated with choroidal thinning compared to health. This improves with successful treatment. Retinal OCT may represent a novel means of assessing disease activity and treatment response in AAV. Larger studies will explore these findings further.