Eye

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Effects of hydroxychloroquine therapy on choroidal volume and choroidal vascularity index

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Abstract

Purpose

To determine changes in choroidal volume (CV) and choroidal vascularity index (CVI) in patients on hydroxychloroquine (HCQ) therapy.

Methods

Retrospective analysis of patients on HCQ therapy. CV and CVI were assessed below the central foveal region on spectral-domain optical coherence tomography using an automatic denoising and localization algorithm. CV and CVI were compared with age-matched controls. Regression analyses were performed to generate associations between CV and CVI with demographics and HCQ treatment parameters.

Associations were assessed using a generalized estimating equation model adjusted for intra-subject inter-eye correlations.

Results

A total of 137 adult patients (23 males and 114 females) were included. Mean age was 45.6 ± 13.7 years and most patients identified as Caucasian (79%). Total duration of HCQ therapy ranged from 3 months to 20 years. Daily HCQ intake varied from 150–600 mg (mean = 304 mg), while cumulative doses ranged from 18–2,800 g. At presentation, the median CV was 0.51 (IQR:0.356–0.747) mm, and median CVI was 0.559 (IQR:0.528–0.578). Increased cumulative HCQ dose was associated with decreased CV ($p = 0.006$). Compared to age-matched controls, CV, CVI, and luminal area were significantly lower in the study group ($p = 0.0003$, 0.0001, and 0.0002).

Conclusion

In this study, we present a novel analysis of key biomarkers which predate the occurrence of HCQ retinopathy. Choroidal volume and vascularity index are significantly reduced in patients on HCQ therapy, especially at higher cumulative doses. These findings suggest new tools to guide medical decision-making for patients receiving HCQ therapy for rheumatologic diseases.