Purpose: To evaluate the influence of hydroxychloroquine treatment in visual field testing and retinal layers thickness after spectral-domain optical coherence tomography (SD-OCT) segmentation.

Methods: Retrospective, cross-sectional study. Patients referred for screening of hydroxychloroquine retinopathy were included. Exclusion criteria included glaucoma and other retinal diseases. All participants underwent complete ophthalmological evaluation, SD-OCT and Humphrey 10-2 visual field testing. A medical chart including weight, height, dosage and duration of hydroxychloroquine treatment was retrieved for each patient. Automatic segmentation provided by the SD-OCT software was used to obtain the thickness for each retinal layer in every 9 ETDRS sectors. For statistical analysis, the 4 inner and 4 outer ETDRS sectors of each retinal layer were aggregated and averaged together. Ganglion cell complex (GCC) was derived as the combination of retinal nerve fiber, inner plexiform and ganglion cell layers. Groups were divided in those with short-term (<5 years) and long term (>=5 years) treatment with hydroxychloroquine.

Results: We included 183 eyes of 93 patients (short-term: 50 eyes; long-term: 133 eyes), mean age 55.99±12.86 years and a marked 84.7% (n=155) female predominance. Patients were being treated for an average of 8.37±5.10 years with a daily dose by real weight of 5.07±1.53 mg/kg, totaling a cumulative dose of 1015.32±673.89 grams of hydroxychloroquine. Groups were similar (p>0.05) in terms of age, sex and spherical equivalent. The overall retinal thickness was significantly thinner in the long-term comparing to the short-term group (313.89±16.63 microns vs. 308.24±13.81; p=0.021). In the long-term group, the inner sectors of the GCC showed a significant inverse correlation with the total cumulative dose (r = -0.30; p=0.001), and the same was true when analyzing the overall retinal thickness of the parafoveal inner sectors (r = -0.19; p=0.026). Even after adjusting for age (beta=-0.11; p=0.273), female sex (beta=-0.26; p=0.005) and spherical equivalent (beta=0.22; p=0.025), the parafoveal GCC of the overall population decreased by 0.003 microns for each gram increase in cumulative hydroxychloroquine dosage (R-squared=14.55%). The parafoveal outer retina (outer nuclear and retinal pigment epithelium layers), as well as the visual field indices (mean deviation and pattern-standard deviation), were similar between both groups and did not show a correlation with total cumulative dose.

Conclusion: Cumulative hydroxychloroquine dosage may lead to progressive thinning of the parafoveal inner retina, particularly the GCC. The summary indices of visual field status do not linearly reflect the long-term effects of hydroxychloroquine.