Introduction: Hydroxychloroquine (HCQ) is widely used for the treatment of rheumatologic, dermatologic and related inflammatory conditions. New applications in diabetes mellitus, heart disease or adjunct cancer therapy are now being considered so HCQ patients are expected to raise in the following years. Outer retinal changes in the fovea and parafovea are extensively discussed in the literature. We hypothesize if HCQ patients with apparent no HCQ retinal toxicity will show lower retinal thickness in inner layers as compared to healthy controls.

Material and Methods: Retrospective study of 43 patients (86 eyes) evaluated at Hospital de Santa Maria (Lisbon, Portugal) for HCQ macular toxicity with spectral-domain OCT (SD-OCT, Heidelberg Engineering, Heidelberg, Germany) between January-April 2016 and with no OCT signs of HCQ maculopathy. Automated retinal layer segmentation at the center of fovea and at a radius of 3 (parafoveal) to 6 mm (perifoveal) from the superior, inferior, temporal and nasal sectors (ETDRS grid) was performed. Cases with image quality less then 20 were excluded. Age and sex-matched controls were used for comparison. Statistical analysis using two sample t-test was made to calculate significant results between groups with 95% confidence interval.

Results: Center macular and internal retinal layers thickness in all parafoveal sectors, particularly in the retinal nerve fibre (RNFL) and ganglion cell layer (GCL), was reduced in HCQ eyes compared to control group (p<0.05). RNFL thickness was also reduced in all perifoveal sectors but temporal (p<0.05).

Inner plexiform layer and inner nuclear layer thickness showed only significant reduction in foveal and nasal parafoveal sector (p<0.05). No significant differences in outer layers was observed between groups.

Conclusions: Small changes in inner retinal layers thickness have been described with HCQ use and conflicting correlation with HCQ toxicity is present in the literature. This study supports that inner retina at the fovea and parafovea is thinner in patients with no outer retinal OCT signs of HCQ toxicity.

Further investigation is needed to assess if a inner retinal thickness reduction threshold measured by automatic segmentation could serve as valuable tool for identifying patients with increased risk of HCQ maculopathy.