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Analysis of Retinal Thinning Using Sdoct Imaging of Sickle Cell Retinopathy Eyes Compared to Age- and Race-Matched Control Eyes

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Purpose: To determine whether the retina is thinner in sickle cell patients than in race- and age-matched controls, and if it is thinner, whether there is any association with systemic diseases.

Methods: Sickle cell and control (age- and race-matched) patients were prospectively enrolled from a university retina clinic into this observational study. Participants underwent visual acuity testing, slit-lamp biomicroscopy, dilated ophthalmoscopy, and spectral domain optical coherence tomography imaging. Sickle cell retinal lesions, degree of vascular tortuosity, caliber of arteriovenous anastomosis, and stage of retinopathy were noted. Early Treatment Diabetic Retinopathy Study (ETDRS) subfield measurements were compared between sickle cell and control subjects and also among sickle cell hemoglobin subtypes. Associations between ETDRS subfield measurements and hemoglobin subtype, retinopathy stage, and systemic diseases were assessed.

Results: A total of 513 sickle cell eyes (260 patients) and 75 control eyes (39 patients) had median visual acuities of 20/20. ETDRS central (*P*=.002), inner (nasal *P*=.009, superior *P*=.021, temporal *P*<.001, inferior *P*=.017), and temporal outer (*P*=.012) subfield measurements were thinner in sickle cell eyes compared to control eyes. Hemoglobin SS eyes had significantly thinner inner ETDRS subfield measurements compared to SC and SThal eyes. Retinal thinning in all subfields was associated with age (*P*=.017) for sickle cell and control eyes. No association was found between retinal thinning and hydroxyurea use or arteriovenous anastomosis caliber.

Conclusions: The macula is thinner in sickle cell eyes compared to control eyes; retinal thickness decreases with increasing age and sickle cell retinopathy stage and is most severe in hemoglobin SS subtypes.