Georgian Scientists
ქართველი მეცნიერები
Vol. 5 Issue 4, 2023
https://doi.org/10.52340/gs.2023.05.04.32

Choroidal and Retinal Thickness in myopic Children Measured by Swept-Source Optical Coherence Tomography

Sofio Meskhi[1]; Davit Shengelia[2]; Bacho Shengelia[2]; Tinatin Kilasonia[2]
[1]Caucasus Medical Center https://orcid.org/0009-0006-6455-6413, Tbilisi state medical university, the Department of Eye Diseases

Abstract

PURPOSE: To investigate the choroidal and retinal thickness in myopic children by swept-source longer-wavelength optical coherence tomography.
DESIGN: Cross-sectional study.
METHODS:
150 schoolchildren aged 7-18 years underwent comprehensive ophthalmic examinations, including cycloplegic refraction, and swept-source optical coherence tomography measurements. The thickness of the choroid, retina and nerve fiber layer were compared among children of different age groups. The topographic variation and factors related to the thickness of the choroid and retinal layers were analyzed.
RESULTS:. Compared to emmetropic subjects, those with myopia had a significantly thinner choroid in all regions ($P < .01$), and emetropic subjects had a thicker choroid in most regions ($P < .05$). The myopic retinas were thinner than those of emmetropic subjects in the superior parafoveal and all 4 perifoveal subfields. The axial length and refractive diopters were independently related to central foveal choroidal thickness, while age and intraocular pressure were independently associated with central fovea retinal thicknesses
CONCLUSIONS: Choroidal thickness, correlated closely with axial length and refractive diopters in myopic children. The retinal thickness of participants with myopia were lower than in those with emmetropia in the superior parafoveal and in both the superior and inferior perifoveal subfields.
Keywords: Choroidal thickness; retinal thickness; myopia; SS-OCT.

MYOPIA IS A GLOBAL PUBLIC HEALTH CONCERN. IT is estimated that one third of the world's population may be affected by myopia by the year 2050(1). The pathophysiology of myopic progression is not well understood, although both genetic and environmental factors have been implicated in this apparent dysregulation of the emmetropization process (2, 3). The choroid, which may facilitate axial growth by modulating the remodeling of the scleral extracellular matrix (4, 5) has been implicated as playing an important role in the emmetropization of the eye during development. Few studies have described retinal and choroidal thickness in children with different refractive states (17–19) but none have studied both characteristics in the same cohort. Swept-Source optical coherence tomography (SSOCT) uses a long-wavelength swept light source to probe the amplitude and phase of backscattering of light from tissue.

In this cross-sectional study, we investigated several retinal and choroidal characteristics, including the thickness of the retina and choroid using SSOCT in children aged 7-16 years, to elucidate the anatomic and topographic variations of the choroidal and retinal layers among myopic children.

Materials and methods: All of the children understood the study protocol, and written informed consents were provided by their parents or other guardians. They were excluded if there was a self-reported history of intraocular surgery or pathology (retinopathy of prematurity, congenital glaucoma, congenital cataract, etc); the parents were unwilling or unable to give written informed consent; or the participant was unwilling or unable to give verbal informed assent.

Each participant underwent comprehensive ophthalmic examinations, including visual acuity, sensorimotor examination, slit-lamp biomicroscopy, tonometry, cycloplegic refraction, and fundus examination. This was followed by ancillary testing, including axial length, corneal curvature measurements, and SSOCT. Visual acuity was measured using a retro illuminated Early Treatment Diabetic Retinopathy Study (ETDRS) chart at a distance of 4 m. Corneal curvature and refraction were determined using a desk-mounted auto-refractor (model KR-8900; Topcon, Tokyo, Japan). Spherical equivalent refraction (SER) was used to classify refractive status. Children were divided into 3 age groups: I. 7-12 age group; II 12-14 age group; III 14-18 age group. Each of them was divided into 3 groups according to the degree of myopia: low (-0,5-3,0); moderate (3,5-6.0) and high (6,5 and more). Control groups were also divided into 3 age groups. Intraocular pressure was measured using a icare. Axial length was measured using noncontact optical biometry (IOLMaster,)

SSOCT (model DRI OCT-1 Atlantis; Topcon), with a lateral resolution of 10 mm and a depth resolution of 8 mm, was used to measure the thickness of choroid and retinal layers. The machine uses a 1050-nm-wavelength light source and has a scanning speed of 100 000 A-scans per second. The 12-line radial scan pattern with a resolution of 1024 3 12 was used. Each image was an average of 4 overlapped consecutive scans, which covered an area of 12 mm 3 9 mm, centered on the fovea.

Built-in software was used to segment layers and construct topographic maps. Choroidal thickness was measured as the distance between the Bruch membrane and the choroid-sclera interface; retinal thickness was measured as the distance between the internal limiting membrane and the interface between photoreceptor outer segments and retinal pigment epithelium. (Figure 1)

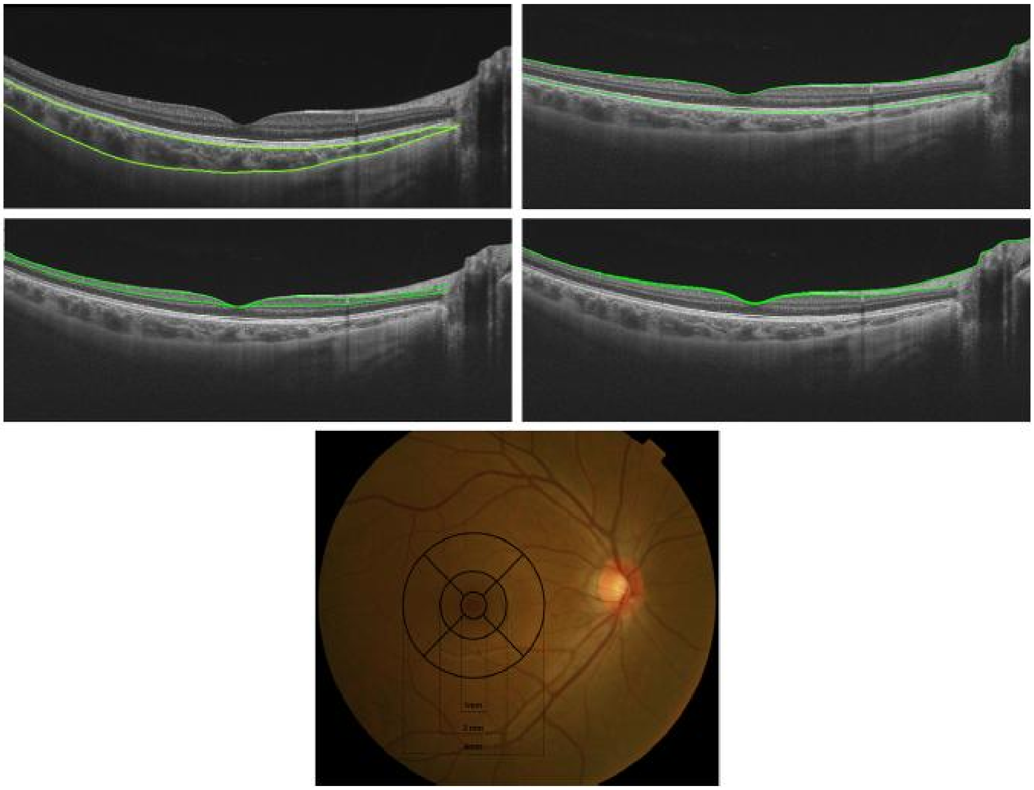

FIGURE 1. The cross-sectional and en face segmentation of choroidal, retinal, ganglion cell layer, and nerve fiber layer thickness measurements obtained by swept-source optical coherence tomography. (Top left) Choroidal thickness, the distance between the Bruch membrane and the choroid-sclera interface. (Top right) Retinal thickness, the distance between the internal limiting membrane and the interface between photoreceptor outer segments and retinal pigment epithelium. (Middle left) Ganglion cell layer thickness, the distance from the interface between the nerve fiber layer and ganglion cell layer to the interface between the inner plexiform layer and inner nuclear layer. (Middle right) Nerve fiber layer thickness, the distance between the internal limiting membrane and the interface between nerve fiber layer and ganglion cell layer. (Bottom) The Early Treatment Diabetic Retinopathy Study (ETDRS) grid: central foveal circle (diameter [1 mm), parafoveally circle (diameter [3 mm), and perifoveal circle (diameter [6 mm). The parafoveally region and the perifoveal region were further subdivided into sup

A single technician performed all the SSOCT image acquisitions between 9 AM and 11 AM, to reduce the impact of diurnal variation. Images with signal strength below 60 were rejected and the test was repeated. On the first 20 participants, the SSOCT was performed twice in order to assess measurement reproducibility

STATISTICAL ANALYSES: Choroid, retina and nerve fiber layer of each subfield

Average thickness was calculated by Built software.

Statistical processing. The results of the research were processed

Using software statistical package. In each group

Age, sex, axial axis, Data were considered statistically significant at p<0.05.

The results were processed by Statistical for Windows Release 19.0.

RESULTS: The average age of the participants involved in the study is 9.69±0.5 years. (Table 1.) The length of the anterior-posterior axis of the eye varied from 20.0 mm to 26.6 mm, spherical equivalent - from 9.00 D to þ 5.25 D, on average 0.15 -1.60 D. of the participants 120 had myopia and 30 had emmetropia. Compared to emmetropic subjects, myopic subjects had a longer axial axis. There was not noticed Statistical difference in central retinal thickness in subjects with myopia between the groups (Table 2), there was no significant difference by gender central foveal choroidal thickness (261± 65 nm vs 269± 68 nm, P=.37) and in terms of central foveal retinal thickness. (236 ± 25 nm vs 233 ± 27 nm, P=.13). No significant correlation was observed between age and central between choroidal thickness (P=.34). In the participants of the refractive status, the following was found: choroidal thickness increased from the nasal quadrant to the temporal quadrants. Horizontally, and vertically, the choroid was thicker in the parafoveal subfield than in the perifoveal field. The layers of the retina are more thicker in the nasal quadrant compared to the temporal. Compared to emmetropic participants, myopic subjects had. Significantly thinner choroid in all segments. Superior parafoveal, as well as Retinal thickness in upper and lower perifoveal subfields with myopia subjects had less, compared to emmetropes. According to the results of the research conducted by us, the retina and choroid thickness correlates strongly between SER and choroidal thickness in all In the region including the central fovea (R2 ¼ 0.11, P<.01), the parafoveal circle (R2 ¼ 0.11, P<.01) and perifoveal circle (R2 ¼ 0.11, P<.01). Positive

A correlation was found between SER and perifoveal retinal thickness regions

Table1. General Characteristics of the Participants and Comparison Among Refractive Groups

parameter	Total N=150	Myopic N=120	Emetropic N 30	*P*
Age	9.70 ± 1.17	10.10± 1.09	9.85± 1.19	0.18
Axial length. mm	23.38± 0.99	24.17 ± 0.96	23.25± 0.72	0.1
				0.2
Intraocular pressure, mm Hg	17.65± 3.05	17.56 ±2.50	17.19± 3.27	0.1
				0.15
Refractive error, D	0.15 ±1.60	2.00 ± 1.45	0.18 ±0.26	0.1

TABLE 2. Topographic Characteristics of Choroid and Retina in Myopic and Emmetropic Subjects

Subfield	Layer	High Myopia	Moderate myopia	Low Myopia	Emmetropia	*P*
Central fovea						
	Retina	234 ±22	231±22	232±23	232±23	0.18
	Choroid	227±61	244±53	253±58	253±58	0.59
Parafoveal Nasal						
	Retina	305±14	308±14	309±23	309±23	0.13
	Choroid	199 ± 60	220±54	222 ± 56	222 ± 56	0.65
Parafoveal Temporal						
	Retina	244 ±63	291±16	293±22	293±20	0.82
	Choroid	242±62	244 ±63	266±56	267±57	0.49
Parafoveal Superior						
	Retina	306 ±20	306±20	312±16	312±19	0.03
	Choroid	225 6±63	228±63	250 ±55	250 ±55	0.06
Parafoveal Inferior						
	Retina	301 - 18	301±18	304±20	298±22	0.13
	Choroid	233±61	235 ±61	254 ±58	254 ±58	0.04
Perifovela Nasal						
	Retina	285±20	285±20	291±24	296±21	<.01
	Choroid	161 ± 51	165±51	177±50	177 ±50	<.01
Perifovel Temporal						
	Retina	260 ±16	160±16	265±19	268±17	<.01
	Choroid	250±54	252±55	271 ±6 52	271± 6 52	<.01
Perifoveal Superior						
	Retina	272 ±13	272±13	280±17	281±20	<.01
	Choroid	222 ± 59	224±60	249± 6 48	249 ±6 48	<.01
Perifoveal Inferior						
	Retina	265 ±19	265±19	274±14	277±18	<.01
	Choroid	224±53	226±54	244 ± 6 55	244 ±6 55	<.01

DISCUSSION

OUR RESULTS INDICATED THAT MYOPIC CHILDREN HAD A thinner choroid in most areas and thinner retina in the superior quadrants and inferior perifoveal subfields. Central foveal choroidal thickness was closely correlated with axial length and refractive status. The mean central foveal choroidal thickness of myopic and emmetropic children in our study were 226 mm, 258 mm, and 272 mm, respectively, while a study of 104 Australian children (10-15 years old) reported a mean subfoveal choroidal thickness of 304 mm in myopic subjects and 360 mm in nonmyopic subjects(22). This discrepancy might be due to population differences, and is consistent with a prior report of Asians with myopia having thinner choroids than whites, Hispanics, and African Americans(23). The choroidal thickness of temporal areas is significantly thicker than that of the nasal areas, which is consistent with prior studies(24–26). Our findings indicated a close correlation between SER and choroidal thickness, and the central foveal choroidal thickness decreased with AL and SER, independently. This result was consistent with previous reports in both adult and pediatric patients.(5,17,22,24,27–33) The mean central foveal retinal thickness of the myopic participants in our study was 234 mm, which is very close to the 240 mm mean retinal thickness reported in a former study that was also conducted in Chinese children(35). The topography findings of retinal layers in our study I consistent with those of emmetropic and myopic adults in previous studies (12,26,36,37). Prior studies yielded conflicting data on retinal thickness in myopic subjects. While some studies have shown retinal thickness to be significantly decreased in myopic subjects,(38,39) other studies found it to be thicker in the central fovea but thinner in the parafoveal and perifoveal regions(.12,35,40,41) Moreover, some studies found no relationship between retinal thickness and SER, age, or axial lengths.(37,42) In our cohort, compared to emmetropic subjects, thinner retinal thickness was observed in myopic subjects in the superior parafoveal and perifoveal subfields and in the inferior perifoveal subfield. We found no relationship between subfoveal/parafoveal retinal thickness and either SER or AL, although subfoveal retinal thickness was seen to decrease with age and increase with IOP, which is consistent with previous studies performed in adult populations (37,38,43). The significance of these observations is unclear. While some suggested that the thickness of the ganglion cell layer and peripapillary nerve fiber layer is correlated with SER and AL in adults,44–48 others did not observe this relationship (49).

In summary, our data suggest that in Chinese children, the thickness of the subfoveal choroid, but not the retina, correlates closely with SER and AL. The perifoveal retinal and ganglion cell layer thickness is less in myopic subjects than in emmetropic subjects. In the context of previous studies suggesting that choroidal changes precede scleral changes in induced ametropia, we propose that, during the early stage of myopia progression, choroid thinning occurs first.

In conclusion, myopic children have a thinner choroid in all areas, and thinner retina in the superior and inferior perifoveal regions, than do their emmetropic counterparts. Central foveal choroidal thickness was closely correlated with axial length and refractive diopters, while central foveal retinal thickness was related to age and intraocular pressure.

REFERENCES

1. Dolgin E. The myopia boom. Nature 2015;519(7543):276–278.

2. Morgan IG, Ohno-Matsui K, Saw SM. Myopia. Lancet 2012;379(9827):1739–1748.

3. Cook RC, Glasscock RE. Refractive and ocular findings in thenewborn. Am J Ophthalmol 1951;34(10):1407–1413.

4. Summers JA. The choroid as a sclera growth regulator. Exp Eye Res 2013;114:120–127.

5. Vincent SJ, Collins MJ, Read SA, Carney LG. Retinal and choroidal thickness in myopic an isometropia. Invest Ophthalmol Vis Sci 2013;54(4):2445–2456.
7. Nickla DL, Wildsoet C, Wallman J. Compensation for spectacle lenses involves changes in proteoglycan synthesis in both the sclera and choroid. Curr Eye Res 1997; 16(4):320–326
8. Wallman J, Wildsoet C, Xu A, et al. Moving the retina: choroidal modulation of refractive state. Vision Res 1995;35(1):37–50.
9. Wildsoet C, Wallman J. Choroidal and scleral mechanisms of compensation for spectacle lenses in chicks. Vision Res 1995;35(9):1175–1194.
10. Wildsoet CF. Active emmetropization-evidence for its existence and ramifications for clinical practice. Ophthalmic Physiol Opt. 1997;17(4):279-290.
11. Wong AC, Chan CW, Hui SP. Relationship of gender, body mass index, and axial length with central retinal thickness using optical coherence tomography. Eye 2005;19(3):292–297.
12. Lim MC, Hoh ST, Foster PJ, et al. Use of optical coherence tomography to assess variations in macular retinal thickness in myopia. Invest Ophthalmol Vis Sci 2005;46(3):974–978.
13. Yamashita T, Tanaka M, Kii Y, Nakao K, Sakamoto T. Association between retinal thickness of 64 sectors in posterior pole determined by optical coherence tomography and axial length and body height. Invest Ophthalmol. Vis Sci 2013;54(12):7478–7482.
14. Pang Y, Goodfellow GW, Allison C, Block S, Frantz KA. A prospective study of macular thickness in amblyopic children with unilateral high myopia. Invest Ophthalmol Vis Sci 2011; 52(5):2444–2449.
15. Lam DS, Leung KS, Mohamed S, et al. Regional variations in the relationship between macular thickness measurements and myopia. Invest Ophthalmol Vis Sci 2007;48(1):376–382.
16. Luo HD, Gazzard G, Fong A, et al. Myopia, axial length, and OCT characteristics of the macula in Singaporean children. Invest Ophthalmol Vis Sci 2006;47(7): 2773–2781.
17. Nishida Y, Fujiwara T, Imamura Y, Lima LH, Kurosaka D,Spaide RF. Choroidal thickness and visual acuity in highly myopic eyes. Retina 2012;32(7):1229–1236.
18. Read SA, Alonso-Caneiro D, Vincent SJ, Collins MJ. Longitudinal changes in choroidal thickness and eye growth in childhood. Invest Ophthalmol Vis Sci 2015;56(5):3103–3112.
19. Zhang Z, He X, Zhu J, Jiang K, Zheng W, K. B. Macular measurements using optical coherence tomography in healthy Chinese school age children. Invest Ophthalmol VisSci 2011;52(9):6377–6383.
20. Unterhuber A, Povazay B, Hermann B, Sattmann H, Chavez-Pirson A, Drexler W. In vivo retinal optical coherence tomography at 1040 nm - enhanced penetration into the choroid. Opt Express 2005;13(9):3252–3258.
21. Matsuo Y, Sakamoto T, Yamashita T, Tomita M, ShirasawaM, Terasaki H. Comparisons of choroidal thickness of normal eyes obtained by two different spectral- domain OCT instruments and one swept-source OCT instrument. Invest Ophthalmol Vis Sci 2013;54(12): 7630–7636.
22. Read SA, Collins MJ, Vincent SJ, Alonso-Caneiro D. Choroidal thickness in myopic and no myopic children assessed with enhanced depth imaging optical coherence tomography. Invest Ophthalmol Vis Sci 2013;54(12): 7578–7586.
23. Harb E, Hyman L, Gwiazda J, et al. Choroidal thickness profiles in myopic eyes of young adults in the Correction of Myopia Evaluation Trial Cohort. Am J Ophthalmol 2015; 160(1):62–71.e62.

24. Hirata M, Tsujikawa A, Matsumoto A, et al. Macular choroidal thickness and volume in normal subjects measured by swept-source optical coherence tomography. Invest Ophthalmol Vis Sci 2011;52(8):4971–4978.
25. Bidaut-Garnier M, Schwartz C, Puyraveau M, Montard M, Delbosc B, Saleh M. Choroidal thickness measurement in children using optical coherence tomography. Retina 2014; 34(4):768–774.
26. Ikuno Y, Tano Y. Retinal and choroidal biometry in highly myopic eyes with spectral domain optical coherence tomography. Invest Ophthalmol Vis Sci 2009;50(8):3876–3880.
27. Margolis R, Spaide RF. A pilot study of enhanced depth imaging optical coherence tomography of the choroid in normal eyes. Am J Ophthalmol 2009;147(5):811–815.
28. Ho M, Liu DT, Chan VC, Lam DS. Choroidal thickness measurement in myopic eyes by enhanced depth optical coherence tomography. Ophthalmology 2013;120(9):1909–1914.
29. Ikuno Y, Kawaguchi K, Nouchi T, Yasuno Y. Choroidal thickness in healthy Japanese subjects. Invest Ophthalmol Vis Sci 2010;51(4):2173–2176.
30. Fujiwara T, Imamura Y, Margolis R, Slakter JS, Spaide RF. Enhanced depth imaging optical coherence tomography of the choroid in highly myopic eyes. Am J Ophthalmol 2009; 148(3):445–450.
31. Shao L, Xu L, Wei WB, et al. Visual acuity and subfoveal choroidal thickness: the Beijing Eye Study. Am J Ophthalmol. 2014;158(4):702-709.e1. doi:10.1016/j.ajo.2014.05.023
32. Flores-Moreno I, Ruiz-Medrano J, Duker JS, Ruiz-Moreno JM. The relationship between retinal and choroidal thickness and visual acuity in highly myopic eyes. Br J Ophthalmol 2013; 97(8):1010–1013.
33. Al-Haddad C, El Chaar L, Antonios R, El-Dairi M, Noureddin B. Interocular symmetry in macular choroidal thickness in children. J Ophthalmol. 2014; 2014:472391. doi:10.1155/2014/472391
34. Karahan E, Zengin MO, Tuncer I. Correlation of choroidal thickness with outer and inner retinal layers. Ophthalmic Surg Lasers Imaging Retina 2013;44(6):544–548.
35. Chen S, Wang B, Dong N, Ren X, Zhang T, Xiao L. Macular measurements using spectral-domain optical coherence tomography in Chinese myopic children. Invest Ophthalmol. Vis Sci 2014;55(11):7410–7416.
36. Huang J, Liu X, Wu Z, Xiao H, Dustin L, Sadda S. Macular thickness measurements in normal eyes with time-domain and Fourier-domain optical coherence tomography. Retina2009;29(7):980–987.
37. Ooto S, Hangai M, Tomidokoro A, et al. Effects of age, sex, and axial length on the three-dimensional profile of normal macular layer structures. Invest Ophthalmol Vis Sci 2011; 52(12):8769–8779.
38. Song WK, Lee SC, Lee ES, Kim CY, Kim SS. Macular thickness variations with sex, age, and axial length in healthy subjects: a spectral domain-optical coherence tomography study. Invest Ophthalmol Vis Sci 2010;51(8):3913–3918.
39. Grossniklaus HE, Green WR. Pathologic findings in pathologic myopia. Retina 1992;12(2):127–133.
40. Wu PC, Chen YJ, Chen CH, et al. Assessment of macular retinal thickness and volume in normal eyes and highly myopic eyes with third-generation optical coherence tomography. Eye 2008;22(4):551–555.

41. Liu, X., Shen, M., Yuan, Y., Huang, S., Zhu, D., Ma, Q., Ye, X., & Lu, F. (2015). Macular Thickness Profiles of Intraretinal Layers in Myopia Evaluated by Ultrahigh-Resolution Optical Coherence Tomography. American journal of ophthalmology, 160(1), 53–61.e2. https://doi.org/10.1016/j.ajo.2015.03.012

42. Ooto S, Hangai M, Sakamoto A, et al. Three-dimensional profile of macular retinal thickness in normal Japanese eyes. Invest Ophthalmol Vis Sci 2010;51(1):465–473.

43. Kim, N. R., Kim, J. H., Lee, J., Lee, E. S., Seong, G. J., & Kim, C. Y. (2011). Determinants of perimacular inner retinal layer thickness in normal eyes measured by Fourier-domain optical coherence tomography. Investigative ophthalmology & visual science, 52(6), 3413–3418. https://doi.org/10.1167/iovs.10-6648

44. Kim, M. J., Lee, E. J., & Kim, T. W. (2010). Peripapillary retinal nerve fibre layer thickness profile in subjects with myopia measured using the Stratus optical coherence tomography. The British journal of ophthalmology, 94(1), 115–120. https://doi.org/10.1136/bjo.2009.162206

45. Kang, S. H., Hong, S. W., Im, S. K., Lee, S. H., & Ahn, M. D. (2010). Effect of myopia on the thickness of the retinal nerve fiber layer measured by Cirrus HD optical coherence tomography. Investigative ophthalmology & visual science, 51(8), 4075–4083. https://doi.org/10.1167/iovs.09-4737

47. Zhu BD, Li SM, Li H, et al. Retinal nerve fiber layer thickness in a population of 12-year-old children in central China measured by iVue-100 spectral-domain optical coherence tomography: the Anyang Childhood Eye Study. Invest Ophthalmol Vis Sci 2013;54(13):8104–8111.

48. Leung, C. K., Mohamed, S., Leung, K. S., Cheung, C. Y., Chan, S. L., Cheng, D. K., Lee, A. K., Leung, G. Y., Rao, S. K., & Lam, D. S. (2006). Retinal nerve fiber layer measurements in myopia: An optical coherence tomography study. Investigative ophthalmology & visual science, 47(12), 5171–5176. https://doi.org/10.1167/iovs.06-0545

49. Hoh, S. T., Lim, M. C., Seah, S. K., Lim, A. T., Chew, S. J., Foster, P. J., & Aung, T. (2006). Peripapillary retinal nerve fiber layer thickness variations with myopia. Ophthalmology, 113(5), 773–777. https://doi.org/10.1016/j.ophtha.2006.01.058

ქოროიდეისა და ბადურის სისქე ახლომხედველ ბავშვებში გაზომილი SS-ოპტიკური კოჰერენტული ტომოგრაფის მეშვეობით

სოფიო მესხი[1], დავით შენგელია[2], ბადრი შენგელია[2], თინთინ კილასონია[2]

[1]კავკასიის მედიცინის ცენტრი; [2]თსსუ, თვალის სნეულებათა დეპარტამენტი,

აბსტრაქტი

ახლომხედველ თვალებში ქორიოიდეასა და ბადურისმორფოლოგიური ცვლილებები კარგადაა შესწავლილი მოზრდილებში, მაგრამ ეს ცვლილებები არასაკმარისადაა აღწერილი ბავშვებში. კვლევები, სადაც აღწერილია ბადურის და ქორიოიდეის სისქე სხვადასხვა რეფრაქციული მდგომარეობის მქონე ბავშვებში მცირერიცხოვანია.

კვლევის მიზანს წარმოადგენდა ასაკისა და რეფრაქციის კორელაციის შეფასება ბადურისა და ქორიოიდეის სისქესთან ახლომხედველ ბავშვებში SS-OCT-ის გამოყენებით.

ჩატარებულია ჯვარედინი კვლევა ქორიოიდეისა დაბადურის შრეების ანატომიური და ტოპოგრაფიული ვარიაციების გასარკვევად ახლომხედველ ბავშვებში. გამოყენებულია SSOCT (SS-OCTA DRI Triton Topcon) მოწყობილობა ფართოზოლიაინ ინფრაწითელთან მიახლოებული სუპერლუმინესცენციური დიოდით, რომლის სინათლის წყაროს ტალღის სიგრძე 1050 ნმ-ია, ასევე, ერთჯერადი ფოტოდიოდი, როგორც დეტექტორი. SS-OCTA აწყობილია შემოწმებულ კლინიკურ პლატფორმაზე DRI Triton ეფუძნება CTARA-ს დაპატენტებულ ალგორითმს.

კვლევის მონაცემების მიხედვით, ქორიოიდეისა და ბადურის სისქე მჭიდროდ კორელირებს SER-თან და AL-თან. ბადურის პერიფოვეალური სისქე მიოპიის მქონე ბავშვებში უფრო მცირეა, ვიდრე ემეტროპებში. წინამორბედი კვლევების კონტექსტში, სადაც ავტორები ვარაუდობენ, რომ ქორიოიდეის მიდამოში გამოვლენილი ცვლილებებიწინ უსწრებს სკლერის ცვლილებებს ინდუცირებულ ამეტროპიაში, ავტორები თვლიან, რომ მიოპიის პროგრესირების ადრეულ სტადიაზე ვითარდება ჯერ ქორიოიდის გათხელება, რასაც მოსდევს ბადურის გათხელება პერიფოვეალურ მიდამოში, რაც პროგრესირებს ცენტრიდანული მიმართულებით. კვლევის შედეგების ინტერპრეტაციისას აუცილებლად მხედველობაშია მისაღები ის, რომ SSOCT-ით გაზომილი ქორიოიდეის სისქე მეტია, ვიდრე სხვა OCT ინსტრუმენტების გამოყენების შემთხვევაში. ამრიგად, კვლევის ქორიოიდეის სისქის მონაცემები არ შეიძლება პირდაპირ შედარდეს სხვა OCT ინსტრუმენტების გამოყენებით ჩატარებული კვლევების მონაცემებს.

ჩვენს მიერ ჩატარებული კვლევების მიხედვით აღმოჩნდა, რომ ახლომხედველ ბავშვებს აქვთ უფრო თხელი ქორიოიდეა ყველა მიდამოში და უფრო თხელი ბადურა ზედა და ქვედა პერიფოვეალურ რეგიონებში, ემეტროპებთან შედარებით. ქორიოიდეის სისქე ფოვეის მიდამოში მჭიდროდ კორელირებს აქსიალურ სიგრძესადა რეფრაქციის ხარისხთან.

საკვანძო სიტყვები: ქორიოიდეის სისქე; ბადურის სისქე; მიოპია; ოპტიკურ ოჰერენტული ტომორაფია (SS-OCT).