Retinal Nerve Fiber Layer Thickness and Optic Disc Parameters in Anisometropic Amblyopia by Cirrus HD OCT in Pediatric Population

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Abstract

Background: To compare the peripapillary retinal nerve fiber layer (RNFL) thickness and characteristics of optic disc parameters in amblyopic and fellow eyes in pediatric patients with an isometropic amblyopia by Cirrus HD OCT.

Method: This study was a prospective, cross-sectional, study including thirty-five subjects of newly diagnosed anisometropic amblyopia. All children underwent an ophthalmic examination that included visual acuity, and optical coherence tomography (Cirrus OCT Zeiss, 'Optic Disc Cube 200×200' protocol). Measurement of the Retinal nerve fiber layer and optic nerve head parameters (ONH) was done for both amblyopic and normal fellow eyes.

Results: The mean best corrected visual acuity (log MAR scale) of the normal eyes and the amblyopic eye was statistically significant (P <0.001). The average RNFL thickness in the normal eye was 96.34 ± 9.3 µm (range 76 – 122 µm) while that of the amblyopic eye was 97.94 ± 11 µm (range 77-125 µm) which was not statistically significant (P=0.294). Among four quadrant and 12 o’clock hour sector analysis, nasal and temporal sector had significant difference between amblyopic and normal eyes respectively (P=0.027, P=0.045). Among the ONH parameters, the average cup-to-disc area ratio and cup volume was lesser in the amblyopic eyes than in the fellow eyes (P=0.042, P=0.023 respectively). None of the other ONH parameters were significantly different between the investigated eyes.

Conclusions: There was no difference between average RNFL thickness in amblyopic and normal fellow eye. Some of the morphological measurements between the amblyopic and fellow eyes in patients with unilateral amblyopia were significantly different.

Keywords: Amblyopia anisometric; Peripapillary retinal nerve fiber layer thickness; Optic Nerve; Head Parameters; Cirrus HD OCT
Introduction

Amblyopia is defined as a decrease of visual acuity for which no causes can be detected by the physical examination of the eye, caused by vision deprivation or abnormal binocular interaction [1]. Amblyopia is one of the most common causes of visual loss in children affecting 0.2% to 1.1% of school going children. The causes of amblyopia in decreasing order of prevalence are strabismic, anisometropic, mixed, ametropic, meridional and sensory deprivation amblyopia [1,2]. A difference in refractive error between the two eyes (anisometropia) is a common cause of amblyopia, being present as the only identifiable amblyogenic factor in 37% of cases and present concomitantly with strabismus in an additional 24% of clinical populations [2]. The literature and experimental studies had described the pathophysiology structural changes in amblyopia at different levels of the visual information processing pathway. The anatomical changes have been described at the cortical, lateral geniculate body and retinal levels [3].

There tinal nerve fiber layer thickness (RNFL) thickness studies with optical coherence tomography (OCT) have been done in various ethnic population in pediatric and adult age group with amblyopia [3-10]. Various studies have described changes in all children irrespective of whether they were newly diagnosed, persistent or resistant to occlusion and refractive therapy. Changes in peripapillary and macular area have been shown to be inconsistently related to the amblyopic status of the eye [11-17]. Studies using OCT imaging of the retina have variable results, some studies have found an increased peripapillary RNFL or/and macular thickness in amblyopic eyes, whereas others have found no significant differences between amblyopic and healthy eyes [17-24].

There has been scarcity of literature describing the changes in optic nerve parameters (ONH) and twelve sector RNFL changes in anisometropic amblyopia. Hence, the present study was done to evaluate the changes in thickness of RNFL and optic disc parameters in pediatric patients with newly diagnosed anisometropic amblyopia.

Materials and Methods

This study was conducted at the Department of Pediatric Ophthalmology at Aravind Eye Hospital. This study adhered to the Declaration of Helsinki and was approved by the institutional review board. Informed consent was taken from parents or guardians. Unilateral amblyopia was defined as a best corrected visual acuity (BCVA) of at least a two-line difference between the amblyopic and fellow eye. All the patients aged 5 to 17 yrs with newly diagnosed anisometropic amblyopia (defined as 1 D or greater in spherical equivalent, or a 1.5 D or greater difference in astigmatism between both the eyes in the absence of any measurable heterotropia at distance or near) with normal appearing disc, cup and neuoretinal rim on examination of the optic nerve head with + 90D aided stereoscopic slit - lamp indirect ophthalmoscopes were enrolled in the study. Patients with strabismus, ocular motility disorders, any pathologies of retinal nerve fibre layer or disc, family history of glaucoma or any intraocular surgery or any kind of laser therapy, mentally challenged children, any systemic diseases affecting eye were excluded from study.

All subjects received a full ophthalmic examination including cycloplegic refraction, assessment of ocular motility, slit-lamp biomicroscopic evaluation, dilated fundus examination and axial length by IOL master© (Carl Zeiss Meditec, Dublin, CA) (ver. 5.2.1). Pupils were dilated with tropicamide 1% and cyclopentolate 1% drops, depending on age of the subject. RNFL was measured through dilated pupils using a 3rd generation optical coherence tomographer (Cirrus OCT®, model HD-OCT 4000, Carl Zeiss Meditec, Dublin, CA) (ver.3.0.0.64). Peripapillary measurements were measured using the fast scan protocol (fast RNFL thickness scan). Three 200×200-cube optic disc scans were done successively, with a total acquisition time of 1.5 s. The average of the 3 scans was analyzed. All scans were performed by the same investigator. An internal fixation target was used in all scans, and the location of each scan on the retina was monitored on the built-in infrared-sensitive video camera. The mean RNFL thicknesses at 256 cubes of the RNFL thickness were recorded and the average RNFL thicknesses in all quadrants were analyzed.

RNFL thickness (all four quadrants: superior, nasal, inferior and temporal, average, and clock hours), RNFL symmetry, rim area, disc area, average C/D ratio, vertical C/D ratio and cup volume were recorded. For the clock hour RNFL thicknesses, twelve 30° sectors were defined in clockwise order for the right and left eyes; in that respect, clock hour 1 in the right eye corresponded to clock hour 11 in the left eye, clock hour 2 in the right eye corresponded to clock hour 10 in the left eye, 3–9, 4–8, 5–7 respectively, etc.
**Statistical Analysis**

The BCVA was transformed to logarithm of the minimum angle of resolution (log MAR) units for the statistical analysis. Mean (SD) or frequency (percentage) was used to describe summary data. Paired t-test / Wilcoxon Signed Rank test was used to test mean difference of retinal nerve fibre layer thickness and ocular parameters between amblyopic eye and normal eye. P-value less than 0.05 were considered as statistically significant. All the statistical analysis was performed using STATA 11.© (Texas, U.S.A).

**Results**

The mean age of patients was 9.83 ±3 (5-17 years). There were 19 myopic and 16 hypermetropic anisometropes. The clinical characteristics of normal and amblyopic eyes are described in (Table1). The average RNFL thickness in the normal eye was 96.34 ± 9.3 µm (range 76 – 122 µm) while that of the amblyopic eye was 97.94 ± 11 µm (range 77-125 µm) which was not significant (P= 0.294).

| Parameters Mean(SD) Range | Normal Eye | Amblyopic Eye | P - value |
|---------------------------|------------|---------------|-----------|
| Axial length(mm)          | 23.04(1.0) | 23.07(1.4)    | 0.544     |
|                            | 20.75 – 25.33 | 20.65 – 27.08 |           |
| BCVA Log mar              | 0(0)       | 0.55(0.3)        | <0.001    |
|                            | 0 – 0       | 0.3 – 1.18       |           |
| Spherical Equivalent      | -0.24(1.2) | -0.41(4.2)   | 0.780     |
|                            | -5.25 to 1.75 | -13 to 7.5   |           |
| RNFL(µm )                 | 96.34(9.3) | 97.94(11.0) | 0.294     |
|                            | 76 – 122    | 77 – 125      |           |

Table1: Clinical characteristics of the 35 patients with anisometropic amblyopia included in the study.

SD Standard Deviation, RNFL, retinal nerve fiber layer.

The (Table 2) shows the relationship of the average peripapillary RNFL thickness in all the four quadrants between normal and amblyopic eyes. The relationship between mean RNFL in the inferior, superior, temporal quadrant of the normal and amblyopic eye were not statistically significant except in nasal quadrant (P= 0.027).

| Quadrant RNFL( µm )(Mean(SD) Range | Normal Eye | Amblyopic Eye | P - value |
|-----------------------------------|------------|---------------|-----------|
| Superior                          | 120.74(14.9)| 122.77(23.7) | 0.706     |
|                                   | 95 – 170   | 75 – 183      |           |
| Temporal                          | 63.17(9.4) | 66.42(14.0)   | 0.209     |
|                                   | 48 – 87    | 46 – 116      |           |
| Inferior                          | 129.09(13.2)| 125.89(18.5) | 0.456     |
|                                   | 104 – 162  | 70 – 158      |           |
| Nasal                             | 72.37(12.1)| 76.86(12.7)   | 0.027     |
|                                   | 46 – 96    | 49 – 101      |           |

Table 2: Comparison of the Quadrant RNFL parameters between the amblyopic and fellow eyes

The comparison of the mean RNFL of the 12 clock hours of the normal and amblyopic eye was statistically significant only in temporal clock hour (P= 0.045) (Table3).

| Optic Nerve Head parameters Mean(SD) Range | Normal Eye | Amblyopic Eye | P - value |
|-------------------------------------------|------------|---------------|-----------|
| Rim Area (mm²)                            | 1.59 ± 0.3 | 1.62 ± 0.3    | 0.526     |
|                                           | 1.02 – 2.4 | 1.09 – 2.33   |           |
| Disc area(mm²)                            | 2.22(0.5) | 2.15(0.3)    | 0.413     |

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There was a positive correlation between spherical equivalent and RNFL thickness in amblyopic eye (Correlation coefficient 0.5123, P =0.0017). There was a negative correlation between axial length and RNFL thickness of the amblyopic eye (Correlation coefficient -0.5124, P =0.0016) (Figure a & b).

The (Table 4) shows relationship between the mean disc area, mean rim area, and mean vertical CD ratio of the normal eye and the amblyopic eye to be statistically insignificant (P >0.05). The mean average cup-to-disc area ratio and cup volume was lesser in the amblyopic eyes than in the fellow eyes (P=0.042, P=0.023 respectively).

Table3: Comparison of the ONH parameters between the amblyopic and fellow eyes.

| Parameters                | Amblyopic Eyes | Fellow Eyes | P Value |
|---------------------------|---------------|-------------|---------|
| Average CD ratio          | 0.49(0.2)     | 0.45(0.2)   | 0.042   |
| Vertical CD ratio         | 0.47(0.2)     | 0.43(0.2)   | 0.059   |
| Cup volume (mm³)          | 0.19(0.2)     | 0.16(0.2)   | 0.023   |

Abbreviations: C/D, cup-to-disc

Figure a: Correlation between Spherical Equivalent and RNFL thickness in Amblyopic eye.

Figure b: Correlation between Axial length and RNFL thickness in Amblyopic eye.
| 12 clock hour (μm) | Mean(SD) | Normal Eye | Amblyopic Eye | P - value |
|-------------------|----------|------------|---------------|-----------|
|                   | Range    |            |               |           |
| S                 | 124.17(20.9) | 126.60(31.9) | 0.787         |
|                   | 83 – 203 | 71 – 196   |               |           |
| SN                | 113.34(24.6) | 116.74(31.0) | 0.451         |
|                   | 70 – 165 | 72 – 198   |               |           |
| NS                | 93.31(17.0) | 98.34(19.9)  | 0.184         |
|                   | 61 – 128 | 51 – 140   |               |           |
| N                 | 57.20(11.0) | 60.40(12.3)  | 0.376         |
|                   | 27 – 78  | 27 – 78    |               |           |
| NI                | 67.51(14.3) | 72.14(16.7)  | 0.101         |
|                   | 41 – 101 | 47 – 111   |               |           |
| IN                | 111.91(18.3) | 108.09(27.4) | 0.755         |
|                   | 69 – 152 | 48 – 163   |               |           |
| I                 | 145.43(21.7) | 141.83(30.4) | 0.961         |
|                   | 48 – 163 | 46 – 188   |               |           |
| IT                | 130.14(22.6) | 127.43(25.1) | 0.403         |
|                   | 90 – 184 | 67 – 181   |               |           |
| TI                | 65.69(12.1) | 71.20(26.6)  | 0.606         |
|                   | 47 – 101 | 40 – 180   |               |           |
| T                 | 49.49(7.1)  | 54.43(12.5)  | 0.045         |
|                   | 29 - 61  | 38 – 102   |               |           |
| TS                | 73.49(13.9) | 73.31(19.1)  | 0.876         |
|                   | 38 – 102 | 38 – 102   |               |           |
| ST                | 124.29(27.4) | 125.77(36.2) | 0.812         |
|                   | 57 – 182 | 57 – 182   |               |           |

Table 4: Comparison of the 12 clock hour RNFL parameters between the amblyopic and fellow eyes (S-Superior, SN-Superior-nasal, NS-Nasal-superior, N-Nasal, NI-Nasal-inferior, IN-Inferior-nasal, I-Inferior, IT-Inferior-temporal, TI-Temporal-inferior, T-Temporal, TS-Temporal-superior, ST-Superior-temporal)

Discussion

In this study we assessed the RNFL and ONH parameters of the pediatric patients with newly diagnosed unilateral amblyopia using OCT imaging. Previous OCT studies of RNFL thickness in anisometric
amblyopia have yielded inconsistent findings [10-25]. In our study, the mean average RNFL thickness in the normal eye and the amblyopic eye was insignificant (P=0.294). In the normal eyes the RNFL thickness was well in agreement with the pediatric normative data studied by Pawar N et al. by Stratus OCT with an average RNFL thickness of (± SD) 106.11 ± 9.5 μm (range 82.26 - 146.25) [20]. Kee et al enrolled 26 unilateral amblyopic children (6 strabismic, 15 anisometropic, 5 combined amblyopes), and found no difference in RNFL between neither the amblyopic eye and fellow eye, nor between values of these amblyopic patients and 42 normal control children using time-domain OCT [5].

In the Sydney Childhood Eye Study, Huynh et al investigated 48 unilateral amblyopes (17 strabismic, 19 hyperopic anisometropia) and reported that Peripapillary RNFL thickness was not significantly different between amblyopic and normal fellow eyes or normal eyes of non-amblyopic children [6]. Repka et al. in 2006 and 2009 evaluated 17 and 37 subjects of strabismic and anisometropic amblyopia respectively and found no difference in RNFL thickness between amblyopic and sound eyes using TD-OCT [8]. Al Haddad et al found that mean RNFL thickness was similar in amblyopic (95.4 μm) and fellow eyes (94.0 μm) in strabismic and anisometropic amblyopia [11].

Our study is consistent with previous studies showing no difference in RNFL between amblyopic and normal fellow eyes. Table 5 describes summary of previous studies employing optical coherence tomography of the RNFL thickness in pediatric patients with amblyopia.

| Study (first author, year) | Country | No. of patients | Age (years) Range | Type of amblyopia | OCT type | AL data | Spherical Equivalent | RNFL |
|---------------------------|---------|-----------------|-------------------|-------------------|----------|---------|---------------------|-------|
| Yen MY 2004               | Taiwan  | 38              | 26.4±18.3         | Mixed (S, A, R)   | Oct-00   | Measured but not mentioned values | 0.17±3.59 | Significant in Strabismic |
| Altintas 2005             | Turkey  | 14              | 10.43±4.0 (5-18)  | S                 | 3-Oct    | ND      | Nd                  | Not significant |
| YoonSW 2005               | Korea   | 31              | 7.7 (5-12)        | Hypermetropicamblyopia | Oct-00   | ND      | 3.71 (+2 to +6.5)   | Significant, Thicker |
| Kee 2006                  | Korea   | 26 AE 42 NE     | 8.8.5             | Mixed (S, A, AS)  | 3-Oct    | ND      | ND                  | Not significant |
| Repka 2006                | USA     | 17              | 10.7 (5-30)       | Mixed (S, A, AS)  | Stratus OCT | ND      | <+5                 | Not significant |
| Dickmann 2009             | Italy   | 40              | 15.2 (5-56)       | Mixed (S, A)      | Stratus OCT | ND      | S ≤5D AS ≤3D        | Not significant |
| Huynh 2009                | Australia | 65            | 6 – 12            | Mixed (S, A, AS)  | Stratus OCT | IOL Master | 2.0 ±4.6         | Not significant |

Bandopadhaya SK et al. in their study with anisometropic amblyopia found no changes in the peripapillary RNFL [12]. Firat et al. and Ersan et al. in their study on anisometropic and strabismic amblyopic patients found no significant difference in the mean RNFLT between the amblyopic eye, fellow eye and the eye of normal subjects (P >0.05) [13,15]. Dickmann evaluated 15 strabismic (esotropic) and 15 anisometropic amblyopic patients, and found no inter eye differences in cpRNFL [18]. Yalcin et al. did a comparative study of peripapillary RNFL which included three groups, amblyopic and fellow normal eye of 30 hypermetametric anisometropic amblyopic subjects and normal eye of 30 normal subjects. They concluded that difference between the three groups was statistically insignificant (P = 0.285) [21]. Yassin SA et al. in their study investigated the difference in RNFL thickness between amblyopic eyes, fellow eyes of the amblyopic patients, and normal eyes of the emmetropic subjects and found no clinically significant difference between both recovered and persistent amblyopia [23]. Demircan S et al. with hyperopic anisometropic amblyopia study, found no significant difference between the amblyopic and the fellow eye [25].

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Table 5: Summary of previous studies employing optical coherence tomography of the RNFL thickness in pediatric patients with amblyopia.

| Study          | Country | Sample Size | Mean Age (Range) | Type of Amblyopia | OCT Device | Method | ND | Mean RNFL Thickness (Range) | Significance |
|----------------|---------|-------------|------------------|-------------------|------------|--------|----|----------------------------|--------------|
| Repka 2009     | USA     | 37          | 9.2±1.5 (7–12)   | Mixed (S, A, AS)  | Stratus OCT| ND     |    | 2.03±1.70                  | Not significant |
| Miki 2010      | Japan   | 26           | 10.9±6.3 8.4±6   | Mixed (S, A, AS)  | Stratus OCT| ND     |    | 3.46±3.941 3.37±3.49       | Not significant |
| Al Haddad 2011 | Lebanon | 45          | 20±12.3          | Mixed (S, A)      | Cirrus HD OCT| ND     |    | 0.8±5.2                    | Not significant |
| Dickmann 2011  | Italy   | 30          | 19.7 (10–38)     | Mixed (S, A, AS)  | Stratus OCT| ND     |    | S 1±2.8 R 0.73±4.25        | Not significant |
| Ersan 2012     | Turkey  | 65          | 11.34±4.53 (5-18)| Mixed (S, A)      | Stratus OCT| ND     |    | +8.5±6.5                   | Not significant |
| Alotaibi 2011  | Saudi Arabia | 93    | 8.7±2.21 (5–12) | Mixed (S, A, AS)  | Stratus OCT| ND     |    | 3.46±3.941 3.37±3.49       | Not significant |
| Bandoupa 2012  | Indian  | 39          | 16-May           | A                 | Stratus OCT| ND     |    | 12±1                      | Not significant |
| Wu 2013        | China   | 72          | 9.7 1.9 (5-16)   | Hypermetropic amblyopia | 3D OCT TOPCON | ND |    | +2to +6.5                 | Significant, Thicker |
| Firat 2013     | Turkey  | 36AE 32 normal | 12.6±5.4 (5-23) (4-24) | Mixed (S, A) | Nidek OCT RS3000 | ND |    | S ≤5D AS ≤3D                | Not significant P=0.18 |
| Andalib 2013   | Iran    | 50          | 18-Jun           | Mixed (S, A)      | Stratus OCT| ND     |    | AE +4.75 (+3 to +6) FE +1 (+0.50 to +2) | Not significant P = 0.285 |
| Yalcin 2014    | Turkey  | 60          | 8 – 14 10.5      | Hypermetropic amblyopia | Cirrus HD OCT| ND |    | AE +3.51± 3.6 NE +0.77 ±1.58 | Significant, Thicker |
| Araki S 2014   | Japan   | 21          | 8.5±3.5 (4-18)   | Mixed (S, A, AS)  | RT Vue 100 | ND |    | AE 5.16 ±2.98 NE 1.27±0.83 | Not significant |
| Demircan 2015  | Turkey  | 18          | 8.56±1.92 (5-12) | Hypermetropic amblyopia | Spectralis OCT| IOL Master |    | NA - 0.24±1.2 AE -0.41±4.2 | Not significant P=0.294 |
| Our study      | Indian  | 37          | 9.8±3 (5-17)     | Anisometropic amblyopia | Cirrus HD OCT| IOL master |    | NA - 0.24±1.2 AE -0.41±4.2 | Not significant P=0.294 |

**Abbreviations:** ND: no data, type of amblyopia: anisometropic amblyopia: A, strabismic amblyopia: S, combined amblyopia patients with strabismus and anisometropia: AS, AE Amblyopic eye, NE normal eye, RNFL, retinal nerve fiber layer

In contrary to previous mentioned studies Yen et al. studied 38 patients of refractive, strabismic and anisometropia amblyopia and found that RNFL between the amblyopic eyes and the normal fellow eyes was statistically significant (P < 0.05) [3].
Wu SQ, et al. studied hyperopic anisometropic amblyopia and found thicker peripapillary RNFL than the contra lateral eyes in children [16]. Alotaibi, et al. in their study in 93 patients with strabismic, anisometropic and mixed amblyopia found a significantly thicker RNFL in amblyopic eye (P< 0.0001). For anisometric amblyopic patients the mean total thickness of the retinal fiber there was statistically significant in amblyopic eyes and normal fellow eyes [17]. Araki S, et al. in their study of 21 patients with unilateral amblyopia (14 anisometropic, 4 strabismic amblyopia, and 3 with both) using spectral-domain OCT found the cpRNFL thickness (P<0.01) significantly thicker in the amblyopic eyes than in the fellow eyes. Among the ONH parameters, the rim area was significantly larger and the cup-to-disc area ratio was smaller in the amblyopic eyes than in the fellow eyes (P<0.05). None of the other ONH parameters were significantly different between the studied eyes. In our study, relationship between the mean disc area, mean rim area, and mean vertical CD ratio of the normal eye and the amblyopic eye was statistically insignificant (P >0.05) and amblyopic eyes had small average CD ratio and cup volume [23]. Yoon, et al. concluded that RNFLT in the amblyopic eyes was significantly (P =0.019) thicker than the normal eyes in subjects with hyperopic anisometric amblyopia [24].

In present study the mean RNFL was 4.49 µm thicker in nasal quadrant of the amblyopic than the fellow eye, the difference being statistically significant (P =0.027). In contrary to our study, studies done by Repka, et al. Dickman, et al. [7] Firat, et al. [15] Kee SY, et al. [5] Bandhopadhya, et al. [12] Huynh, et al. [6] Quoc EB, et al. [9] and Wang, et al. [19] found no significant difference in all the four quadrants between the amblyopic and fellow eyes. Demircan, et al. [25] found no significant difference in all four quadrants and the 12 sectors when individually compared between anisometric amblyopic and normal fellow eye.

We did not find any studies describing 12 clock hour sector analyses between normal and anisometropic amblyopic eyes. Few studies have taken in account of axial length in amblyopic eyes [3,6,25]. We found a positive correlation between the spherical equivalent and peripapillary RNFL thickness in amblyopic eye, similar to study by Ersan, et al. who found that RNFL measurements showed a significant positive correlation with spherical equivalent in the anisometric group (both myopic and hypermetropic) [13]. While Yen, et al. showed that there was no significant correlation between RNFL thickness and spherical equivalence (ρ = 0.956) among all amblyopic eyes [3]. Repka, et al. also had similar conclusion of no association between RNFL thickness and hypermetropic refractive error in the ambylopic eye (ρ=0.81) or sound eye (ρ = 0.28) [8].

We had negative correlation between the axial length and RNFL of the amblyopic eyes. In contrary to our study, Yen et al. showed that there was no significant correlation between RNFL and axial length (ρ = 0.655) among all amblyopic eyes [3]. Araki S, et al. showed that the differences in the peripapillary RNFL thickness were significantly correlated with the difference in axial length (r=−0.48) and refractive error (ρ<0.05, r=0.50) [22].

However our study has few limitations. If a larger study population had been taken, it would be more beneficial to assess the changes mentioned above. The results can then be extrapolated to the general population. We also did not have a control group of subjects. The variables of the normal fellow eye can then be compared with the eye of the control subjects. The data obtained from our study applies only to Cirrus HD-OCT. It cannot be compared to that obtained by other spectral domain OCT machine. We did not include a correction factor in relation to age, axial length, refraction and magnification in RNFL, before subjecting it to further statistical analysis.
Conclusion

We found no difference between RNFL thickness in amblyopic and normal fellow eye however nasal quadrant, temporal clock hour sector, average CD ratio, cup volume showed significant differences. Thus some of the morphological measurements between the amblyopic and fellow eyes in patients with unilateral amblyopia were significantly different. Further studies, including histopathological and individual retinal layer analysis with a greater number of patients, are required to ascertain the differences between amblyopic and normal eyes.

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