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Role Of Low Dose Atropine [0.01%] In The Progression Of Childhood Myopia- A Prospective Cohort Study

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Abstract

Objective: The objective of this study was to supplement and strengthen pre-existing treatment modalities for myopia.

Aim: To compare the degree of change in refractive error [in diopters] and axial length [in mm] after a follow-up period of 1 year in myopes receiving low-dose atropine [0.01%] versus those not receiving atropine.

Design and Setting: This prospective cohort study was conducted from March 2022 to April 2024.

Participants: 100 participants in the age group of 6-16 years with a refractive error ranging from -1.5 to -10 D with astigmatism < 1.5 D were included in the study.

Methods: A total of 100 participants were divided into two groups. 50 exposed to 0.01% atropine eye drops once daily at bedtime were compared with 50 age- and sex-matched non-exposed individuals who did not receive the above-mentioned drug and were followed-up 4 monthly for a period of 1 year. At each visit, the degree of refractive error [in diopters] and axial length [in mm] were measured and compared between the two groups.

Results: After 1 year, baseline characteristics were compared with the final outcomes of both the exposed and non-exposed groups. At the end of the study, the mean increase in axial length in the right eye among the non-exposed group was recorded as 0.30 mm and the left eye was 0.28 mm. The mean increase in refractive error in the right eye was 0.75 D and in the left eye was 0.60 D. Among the exposed that received 0.01% of Atropine, the mean increase in axial length at the end of the study was 0.20 mm in the right eye and 0.21 mm in the left eye. The mean increase in the refractive error in the right eye was estimated at 0.24 D and that in the left eye was 0.20 D.

Conclusion: Daily administration of 0.01% atropine at bedtime was effective in slowing the progression of childhood physiological myopia.

Keywords: NIL

Introduction

Myopia, also known as “short sightedness,” is that dioptric condition of the eye in which, with the accommodation at rest, incident parallel rays come to a focus anterior to the light sensitive layer of the retina. It can manifest as a spectrum of clinical features and types. The majority of cases merely result in variants in the frequency curve of the axial length and curvature. The only symptom in patients with low myopia may be an indistinct distant vision. In other cases, and in high myopia, there is often discomfort after near work, due largely to disproportion between the efforts of accommodation and convergence, often leading to exophoria. [1]

2.5 billion people worldwide were affected by myopia in 2020, and approximately 5 billion people are expected to be affected by myopia by the year 2050. Developed countries in East and Southeast Asia have the highest prevalence of adolescent myopia

amounting to 80-90% of young adults with this condition. [2]

Standard critical care for myopia progression, however, only addresses the optical impact of the condition, rather than treating its underlying biological basis. Myopia is the most frequent cause of distance impairment worldwide and is creating an alarming global epidemic with deleterious ramifications for the quality of life and economic health of individuals and nations. In addition to being immediately disadvantageous, myopia increases the risk of serious disorders, such as myopic macular degeneration, retinal detachment, glaucoma, and cataract, and is a leading cause of visual impairment and blindness across many countries. [3]

The exact mechanism of action of atropine is not known;[4] however various theories have been proposed. [4] Some valid arguments in favor of atropine for the treatment of Myopia are its Action on Muscarinic Receptors. Anticholinergics, including atropine, block the action of acetylcholine on muscarinic receptors. Acetylcholine in turn plays an important role in developing retina and regulates the growth of the eye. Currently, only Atropine and Pirenzepine have shown significant effects on growth regulation, but pirenzepine has not been evaluated due to economic constraints. Muscarinic receptors are widely distributed in the eye, including in the cornea, iris, ciliary body, ciliary muscles, lens, retinal pigment epithelium, choroid, and sclera. Atropine acts at all sites to regulate overall eye growth. [5] Atropine is also known to act on other receptors in the eye, including α2A-agrenergic receptors, γ-aminobutyric acid receptors [GABA], and receptor tyrosine kinases [RTK's]. The epidermal growth factor receptor [EGFR] is an RTK that regulates cell growth and proliferation through intracellular signalling pathways. Atropine also reduces EGFR activity. [5] Previously, excessive accommodation by the eye was hypothesized to be responsible for myopia, and atropine causes cycloplegia. This was previously considered the primary rationale for using atropine in the treatment of myopia. However, non-accommodative mechanisms were later implicated as the primary causative factors. [5]

Material & Methods:

This prospective cohort study was conducted from March 2022 to April 2024. Ethical clearance for the study was obtained from the Institutional Ethics Committee. Informed consent was obtained from all participants before enrolment in the study.

Inclusion criteria-

1. Age Group: 6-16 years of age
2. Range of Myopia: -1.5 to -10D
3. Degree of Astigmatism: <1.5 D

Exclusion criteria-

1. Any other ocular abnormalities
2. Any other systemic abnormalities
3. Any contraindication to the use of Atropine
4. Allergy or hypersensitivity to Atropine
5. Intolerable side effects to the use of Atropine
6. Pathological myopia

A total of 100 patients age group–6-16 years with physiological myopia in the range of -1.5 to -10 D were identified. Informed consent was obtained from the parents or guardians of all the participants included in the study. They were divided into two groups. Fifty patients who were prescribed 0.01% atropine eye drops once daily at bedtime were grouped as exposed, and 50 patients who did not receive the above treatment were classified as non-exposed.

At the outset, all patients underwent thorough history taking and a detailed general physical examination. Visual acuity was assessed using the logMAR chart, and only patients with an otherwise unremarkable ocular examination were included in the study. Dilated fundus examination using an indirect ophthalmoscope and a 20 D lens was performed to exclude patients with pathological myopia. Cycloplegic autorefraction was performed after instillation of 1% cyclopentolate eye drops three times 10 min apart. The axial length was calculated using ultrasound biometry, taking the average of five readings from each eye.

The study participants were followed up monthly for 4 months for a period of 1 year, and similar examinations were performed at each visit. At the end of the study, we calculated the mean changes in refractive error and axial length between the exposed and non-exposed groups.

Results:

Our study included 100 patients age group–6-16 years with a mean age of 13.06±2.30 years [Table 2]. The participants were divided into 50 exposed and 50 non-exposed groups [Table 1]. The groups were age- and

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sex-matched, with 52% males and 48% females. The exposed patients, in addition to all other available treatment modalities, received topical low-dose [0.01%] atropine eye drops once daily at bedtime during the course of the study. Variables such as age, sex, and sex did not differ significantly between the two groups. After thorough history taking and general physical examination, all patients underwent a basic ophthalmic examination including visual acuity using the LogMAR vision chart and a dilated fundus examination to rule out the possibility of pathological myopia. Cycloplegic autorefraction was performed after instillation of 1% cyclopentolate eye drops three times, 10 min apart. The axial length was calculated using ultrasound biometry. These investigations were repeated at each visit thereafter 4 monthly for a period of one year.

The best-corrected visual acuity [BCVA] did not significantly differ between the two groups at baseline, with a similar number of patients falling into each category. [table 3] The two eyes of the same patient had similar visual acuity. [figure 1] The dilated fundus examination was unremarkable in all the subjects. The baseline values of the axial length and refractive error were similar among the study participants. [table 4] The mean axial length of the right eye in the non-exposed group at baseline was 23.99±1.12 mm and in the exposed was 23.98±1.06 mm. The mean axial length of the left eye in the non-exposed at baseline was calculated as 24.00±1.17 mm and in the exposed was 23.92±1.11 mm. the average axial length among the exposed group at baseline in the right eye was estimated as 2.80±1.34 D and in the non-exposed group was 2.70±1.13 D. The mean refractive error in the left eye among the exposed was estimated at 2.86±1.39 D and among the non-exposed was 2.85±1.35 D. [table 5]

After 1 year, the baseline characteristics were compared with the final outcomes in both the exposed and non-exposed groups. During the observation period, patients were followed up at 4 monthly intervals and similar examinations were repeated at each visit. At the end of the study, the mean increase in axial length in the right eye among the non-exposed group was recorded as 0.30 mm and the left eye was 0.28 mm. The mean increase in refractive error in the right eye was 0.75 D and in the left eye was 0.60 D. [table 8]

Among the exposed that received 0.01% of Atropine, the mean increase in axial length at the end of the study was 0.20 mm in the right eye and 0.21 mm in the left eye. The mean increase in the refractive error in the right eye was estimated at 0.24 D and left eye as 0.20 D. [table 11]

Axial length and refractive error were compared between the two groups. It was observed that the increase was greater in the non-exposed group than in those receiving 0.01% atropine eye drops. The mean differential change in axial length in the right eye between the two groups was estimated as 0.11 mm [p-value 0.06] and in the left eye as 0.07 mm [p-value-0.16]. This shows that the non-exposed group had a 0.11 mm greater increase in axial length in the right eye and 0.07 mm greater change in the left eye than the exposed group. Similarly, the mean differential change in the refractive error in the right eye was 0.51 D [p-value<0.05] and 0.40 D [p-value<0.05] in the left eye. [table 12] [figure 2]

The percentage change in axial length between the exposed and non-exposed was estimated with the non-exposed showing a mean percentage change in axial length of 1.27±0.97% in the right eye and 1.18±0.55% in the left eye. Similarly, the percentage change in axial length among the exposed was 0.83±1.30% in the right eye and 0.89±1.43% in the left eye. The percentage change in refractive error among the non-exposed was estimated at 31.91±19.34% in the right eye and 23.46±17.54% in the left eye. [p-value<0.05] Similarly, the percentage change in refractive error among the exposed was estimated as 9.16±9.96% in the right eye and 7.97±12.45% in the left eye. [p-value<0.05] [table 13]

No significant side effects were observed with drug use. Only one patient discontinued treatment because of intolerable glare and photophobia.

Discussion:

The global prevalence of myopia is estimated to be 30–34% in 2020 and is predicted to increase to approximately 50% by 2050; 938 million people are projected to develop myopia with refractive error less than −6 diopters [D] by 2050, with an increased risk of major sequelae. Myopia usually presents at 6- 12 years of age. Early onset myopia increases the risk of high myopia and complications including glaucoma,

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cataracts, retinal detachment, and myopic maculopathy. [6]

Atropine blocks the receptors throughout the eye to limit scleral thinning and slow eye elongation. Low-dose atropine [0.01%], has recently emerged as a pharmacological option for controlling myopia progression in children. [6] [7]

It is thought that atropine might exert its effects by altering retinal neurotransmission. Atropine was found to increase the release of dopamine but reduced electroretinogram [ERG] *b* and *d* waves and dampened oscillations of retinal pigment epithelium [RPE] potentials. It has been suggested that by dampening the vital functions of the retina, atropine boosts dopamine release from cellular stores, which then controls eye growth. Atropine resulted in rapid and transient choroidal thickening and inhibited eye growth, suggesting that the two responses, that is, choroidal thickening and eye growth, may be linked. In more recent studies, the administration of 1% and 0.01% atropine resulted in increased sub- and para-foveal choroidal thickness. Furthermore, atropine inhibited choroidal thinning induced by hyperopic defocus. There is also a view that the sclera is the target site for inhibition of myopia by atropine. The synthesis of glycosaminoglycan in the scleral extracellular matrix was inhibited by atropine in studies involving scleral tissues from chicks. [6] [7]

In our study, we included patients age group–6-16 years [8] with a mean age of 13.06±2.30 years taking into consideration that progression of the refractive error is a pre-requisite for atropine to work and once the error stabilizes, it cannot be reversed. This inference was strengthened by various studies, including the one conducted by Kaiti et al. [2022] [7], who showed a reduction in the amount of increase in refractive error in adolescent children with physiological myopia. The error increased irrespective of whether they received a low dose of 0.01% atropine, but the amount of increase was less if the drug was administered. In our study, we obtained similar results, where the refractive error and axial length increased in both eyes of both groups, but the degree of increase was higher in the non-exposed group. Thus, we conclude that 0.01% atropine slows down the progression of myopia instead of stopping or reversing it.

In another study by Audrey chia, et al. [2012] [9], it was demonstrated that in myopic patients age group–6-12 years with myopia of -2 D or worse, there was a dose-related response to atropine, with higher doses inhibiting myopia progression to a slightly greater degree than lower doses, although the myopia progression of −0.49 diopters [D], −0.38 D, and −0.30 D in the atropine 0.01%, 0.1%, and 0.5% groups, respectively, was not significantly different at 24 months. In our study, owing to time constraints, the duration of each patient observation was reduced to 1 year, and only the lowest concentration of 0.01% atropine was used. This limits the overall credibility of our study and did not allow us to calculate any possible relapses on discontinuation of the drug, as was seen in phase 2 of the ATOM2 study where atropine was stopped for 12 months after 24 months of treatment. There was a rapid increase in myopia in children originally treated with higher concentrations of atropine, whereas those receiving the lowest concentration of 0.01% showed minimal change.

We used 0.01% atropine in the age group–6-16 years. This age bracket was used in multiple previous studies, such as the study conducted by Agarwal et al. [2022] [10]. The rationale for this was the progression of myopic errors in this particular age group. Physiological Myopia in the range of -1.5 to -10 diopter was included as was done in a study by Tiana Clark et al 2015 [11] and Audrey chia, et al [2012] [9]. Astigmatism more than 1.5 D was excluded from the study, as was done by Karla Zadnik et al. [2023] [12] and Osamu Hieda et al. [2021] [13]. Taking parameters similar those of as previous studies to select our sample population enabled us to better predict and analyze the study results and provided the best available treatment modality to the patients by selecting the population that would most likely benefit from the study drug.

The patients were followed up 4 monthly for 1 year, and at the end of the study, it was observed that the patients receiving 0.01% atropine eye drops once daily at bedtime for the last year had a lower increase in the refractive error and axial length as compared to patients who did not receive atropine during the course of the study. The non-exposed group had an increase in refractive error by 0.75 D in the right eye and 0.60 D in the left eye whereas the exposed group had an increase in refractive error of 0.24 D in the right eye and 0.20 D in the left eye [p-value<0.05]. mm in the

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left eye, whereas in the non-exposed was 0.30 mm in the right eye and 0.28 mm in the left eye, whereas in the exposed group it was 0.20 mm in the right eye and 0.21 mm in the left eye. This shows that 0.01% Atropine results in slowing the myopia progression by around 0.51D in right eye and 0.40D in the left eye [p-value<0.05] and slows axial length progression by 0.11 mm right eye and 0.07 mm left eye.

These findings were consistent with those of previous studies, such as that conducted by Sharma et al. [2023] [14], in which 200 eyes of 100 myopic children were randomized into two groups based on a computer-generated random number table. The treatment group was administered 0.01% atropine eye drops once at bedtime and the control group was administered a placebo. We did not use a placebo in our study. Follow-up was done at 3-monthly intervals for 12 months by assessing the mean change in spherical equivalent and mean change in axial length. The mean change in spherical equivalent refraction and axial length was significantly lower in the treatment group [0.31 ± 0.55 D; 0.11 ± 0.22 mm] than the placebo group [0.80 ± 1.65 D; 0.23 ± 0.44 D] [*p*-value: 0.003]. These results were similar to those obtained in the present study.

Similar findings were reported by Usmani et al. [2023] [15], where 100 children [mean baseline Spherical Equivalent [spherical equivalent] [-3.70 ± 2.09 D] and axial length [AL] [24.59 ± 1.00 mm]] were analyzed. The mean age of the children was 10.4 ± 2.89 years and 61% were females. The average follow-up time was 17.9 ± 12.5 months. The mean rate of progression of AL and Spherical Equivalent on 0.01% atropine eyedrops was 0.219 ± 0.35 mm and - 0.250 ± 0.86 D/year, respectively. This finding indicates that a low dose of 0.01% atropine was beneficial in reducing the progression of myopia. Our study showed equally positive results at the end of one year.

In a similar study by Shweta Chaurasia, et al [2022] [8] after 1-year of study, Myopia Progression was 0.25 D [IQR 0.13-0.44] and 0.69 D [IQR 0.50-1.0] [p < 0.001] in treatment and control respectively [63.89% reduction] with respective Axial length of 0.14 mm [IQR 0.05-0.35] and 0.32 mm [IQR 0.19-0.46] [p < 0.001] [44.44% reduction].

Low-dose atropine 0.01% did not reverse or stop the progression of myopia in our study, but rather decreased the rate of progression; hence, a progressive error becomes a prerequisite for initiating treatment with the drug. This was corroborated by studies such as that conducted by Matteo Sacchi et al. [2019] [16], wherein atropine was found to be effective only in children with progressive myopic error with a rate of increase of >0.5 D/ year. Stable errors did not respond to topical atropine treatment. This further supports its use in childhood myopia.

We did not find a correlation between the rate of increase in refractive error and the rate of increase in axial length in our study. Only physiological myopia with a normal fundus picture benefits from 0.01% atropine considering that the drug results in slowing the myopia progression by around 0.51D in right eye and 0.40D in the left eye [p-value<0.05] and slows axial length progression by 0.11mm right eye and 0.07mm left eye which is significant only in situations where the total amount of error is not very high hence the relative slowing of the progressive error becomes significant. Studies such as Louis Tong et al [2009] [17] Augusto Azuara-Blanco et al [2020] [18] similarly advocated the use of low-dose Atropine 0.01% only in mild-moderate myopia.

Conclusion:

0.01% atropine is effective in slowing the progression of childhood physiological myopia. Young children with progressive mild-moderate myopia should be prescribed 0.01% atropine as a routine treatment modality.

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Figure Legends:

Figure 1. Bar Chart depicting the distribution of best-corrected visual acuity values at baseline.

Figure 2. Bar Chart showing comparison of change in various parameters at 1 year follow up between Non-exposed and Exposed

Tables with Table Legends:

Table 1. Distribution of study participants according to atropine use.

Study Group	Frequency	Percent
Exposed	50	50.0
Non-Exposed	50	50.0
Total	100	100.0

Table 2. Age distribution of Study participants

Age in years	
Minimum	7
Maximum	16
Mean	13.06
Std. Deviation	2.30
Median	13
IQR	12 - 15

Table 3. Distribution of best corrected visual acuity values at baseline among the study participants

Category	Frequency at Baseline	
	BCVA OD	BCVA OS
0.00	53	54
0.18	28	24
0.30	14	18
0.48	4	3
0.60	1	1
Total	100	100

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Table 4. Various baseline characteristics of Study Participants

Parameter	Axial Length [mm] OD at Baseline	Axial Length [mm] OS at Baseline	AR OD at Baseline	AR OS at Baseline
Minimum	21.96	22.00	1.25	1.25
Maximum	26.93	27.41	7.50	8.00
Mean	23.98	23.96	2.75	2.85
Std. Deviation	1.08	1.14	1.24	1.36
Median	23.97	23.94	2.50	2.50
IQR	23.35 - 24.64	23.05 - 24.66	1.75 - 3.50	1.75 - 3.50

Table 5. Comparison of various baseline parameters between the non-exposed and exposed groups

Parameter	Study Group	Mean	Std. Deviation	Mean Difference	P-Value
Age in years	Non-exposed	12.98	2.31	-0.16	0.73
	Exposed	13.14	2.32		
Axial Length [mm] OD at Baseline	Non-exposed	23.99	1.12	0.01	0.96
	Exposed	23.98	1.06		
Axial Length [mm] OS at Baseline	Non-exposed	24.00	1.17	0.08	0.73
	Exposed	23.92	1.11		
AR OD at Baseline	Non-exposed	2.70	1.13	-0.11	0.67
	Exposed	2.80	1.34		
AR OS at Baseline	Non-exposed	2.85	1.35	0.00	0.99
	Exposed	2.86	1.39		

Table 6. Comparison of various parameters between Baseline and First Follow up in Non-Exposed Group [N=50]

Parameter	Mean	Std. Deviation	Mean difference	P- Value
Axial Length [mm] OD at Baseline	23.99	1.12	-0.12	0.00
Axial Length [mm] OD at First Follow-up [4 months]	24.11	1.13		
Axial Length [mm] OS at Baseline	24.00	1.17	-0.12	0.00

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Axial Length [mm] OS at First Follow-up [4 months]	24.12	1.20		
AR OD at Baseline	2.70	1.13	-0.36	0.00
AR OD at First Follow-up [4 months]	3.05	1.15		
AR OS at Baseline	2.85	1.35	-0.25	0.00
AR OS at First Follow-up [4 months]	3.10	1.41		

Table 7. Comparison of various parameters between Baseline and Second Follow up in Non-Exposed Group [N=50]

Control Group	Mean	Std. Deviation	Mean difference	P- Value
Axial Length [mm] OD at Baseline	23.99	1.12	-0.21	0.00
Axial Length [mm] OD at Second Follow-up [8 Months]	24.20	1.15		
Axial Length [mm] OS at Baseline	24.00	1.17	-0.22	0.00
Axial Length [mm] OS at Second Follow-up [8 Months]	24.22	1.20		
AR OD at Baseline	2.70	1.13	-0.54	0.00
AR OD at Second Follow-up [8 Months]	3.24	1.21		
AR OS at Baseline	2.85	1.35	-0.47	0.00
AR OS at Second Follow-up [8 Months]	3.32	1.39		

Table 8. Comparison of various parameters between Baseline and Final Follow up in Non-Exposed Group [N=50]

Parameter	Mean	Std. Deviation	Mean difference	P- Value
Axial Length [mm] OD at Baseline	23.99	1.12	-0.30	0.00
Axial Length [mm] OD at Final Follow-up [1 Year]	24.29	1.15		

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Axial Length [mm] OS at Baseline	24.00	1.17	-0.28	0.00
Axial Length [mm] OS at Final Follow-up [1 Year]	24.29	1.21		
AR OD at Baseline	2.70	1.13	-0.75	0.00
AR OD at Final Follow-up [1 Year]	3.44	1.21		
AR OS at Baseline	2.85	1.35	-0.60	0.00
AR OS at Final Follow-up [1 Year]	3.45	1.39		

Table 9. Comparison of various parameters between Baseline and First Follow up among Exposed Group [N=50]

Parameter	Mean	Std. Deviation	Mean Difference	P- Value
Axial Length [mm] OD at Baseline	23.98	1.06	-0.09	0.00
Axial Length [mm] OD at First Follow-up [4 months]	24.07	1.07		
Axial Length [mm] OS at Baseline	23.92	1.11	-0.10	0.00
Axial Length [mm] OS at First Follow-up [4 months]	24.03	1.10		
AR OD at Baseline	2.80	1.34	-0.13	0.00
AR OD at First Follow-up [4 months]	2.93	1.44		
AR OS at Baseline	2.86	1.39	-0.09	0.00
AR OS at First Follow-up [4 months]	2.95	1.40		

Table 10. Comparison of various parameters between Baseline and Second Follow up among Exposed Group [N=50]

Parameter	Mean	Std. Deviation	Mean Difference	P- Value
Axial Length [mm] OD at Baseline	23.98	1.06	-0.17	0.00
Axial Length [mm] OD at Second Follow-up [8 Months]	24.15	1.10		
Axial Length [mm] OS at Baseline	23.92	1.11	-0.18	0.00
Axial Length [mm] OS at Second Follow-up [8 Months]	24.10	1.12		
AR OD at Baseline	2.80	1.34	-0.21	0.00

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AR OD at Second Follow-up [8 Months]	3.01	1.46		
AR OS at Baseline	2.86	1.39	-0.17	0.00
AR OS at Second Follow-up [8 Months]	3.02	1.44		

Table 11. Comparison of various parameters between Baseline and Final Follow up among Exposed [N=50]

Parameter	Mean	Std. Deviation	Mean Difference	P- Value
Axial Length [mm] OD at Baseline	23.98	1.06	-0.20	0.00
Axial Length [mm] OD at Final Follow-up [1 Year]	24.18	1.10		
Axial Length [mm] OS at Baseline	23.92	1.11	-0.21	0.00
Axial Length [mm] OS at Final Follow-up [1 Year]	24.13	1.12		
AR OD at Baseline	2.80	1.34	-0.24	0.00
AR OD at Final Follow-up [1 Year]	3.04	1.45		
AR OS at Baseline	2.86	1.39	-0.20	0.00
AR OS at Final Follow-up [1 Year]	3.06	1.43		

Table 12. Comparison of changes in various parameters at 1 year follow up between the Non-exposed and Exposed groups

Characteristics	Study Group	Mean	Std. Deviation	Mean Difference	P- Value
Change in Axial Length [mm] OD at 1 year	Non-exposed	.30	.23	0.11	0.06
	Exposed	.20	.31		
Change in Axial Length [mm] OS at 1 year	Non-exposed	.28	.14	0.07	0.16
	Exposed	.21	.33		
Change in AR OD at 1 year	Non-exposed	.75	.40	0.51	0.00
	Exposed	.24	.29		
Change in AR OS at 1 year	Non-exposed	.60	.29	0.40	0.00
	Exposed	.20	.31		

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Table 13. Comparison of percentage change in various parameters at 1 year follow up between the Non-exposed and Exposed groups

Characteristics	Study Group	Mean	Std. Deviation	Mean Difference	P- Value
% Change in Axial Length [mm] OD at 1 year	Non-exposed	1.27	0.97	0.44	0.06
	Exposed	0.83	1.30		
% Change in Axial Length [mm] OS at 1 year	Non-exposed	1.18	0.55	0.29	0.19
	Exposed	0.89	1.43		
% Change in AR OD at 1 year	Non-exposed	31.91	19.34	22.76	0.00
	Exposed	9.16	9.96		
% Change in AR OS at 1 year	Non-exposed	25.46	17.54	17.49	0.00
	Exposed	7.97	12.45		

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