

Variation of Axis Before and After Cycloplegic Refraction at Paediatric Department of Al-Ibrahim Eye Hospital, Malir, Karachi

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Abstract

Purpose: To determine the variation of refractive error and axis before and after cyclorefraction.

Methodology: An observational, descriptive study had 426 eye and non-probability sampling technique were used. Patient selection according to inclusion and exclusion criteria.

Results: A total of 426 eyes were recruited and examined, who lay in our criteria of age The type of astigmatism has been identified by auto-refractometer both before and after instilling the drops of cyclopentolate, and the comparison has been made on the basis of auto-refractometer readings. Out of these 426 eyes, 238 (55.8%) eyes were of males and 188 (44.1%) eyes were of females. The variation of axis after cyclo refraction out of 426 eyes 293 (68.7%) patients had variation of axis before and after cyclo more than 5° degree, among those 293 eyes, 168 (57.3%) were of males and 125 (42.6%) were of females.

Conclusion: The study showed significant variation of refractive error and axis before and after cycloplegic refraction which was greater than 5 degrees. The major shift was compound myopic astigmatism into compound hypermetropic astigmatism.

Keywords: Refractive Error; Cylindrical Axis; Cycloplegic Drugs; Refraction

Introduction

Cyclopentolate is a muscarinic antagonist. It is commonly used as an eye drop during pediatric eye examinations to dilate the eye

(mydriatic) and prevent the eye from focusing/accommodating (cycloplegic). After instillation of cyclopentolate, pupil dilation (mydriasis) typically lasts up to 24 hours, while paralysis of the

ciliary muscle (cycloplegia) typically lasts 6-24 hours. Refraction is not an easy skill to learn. It takes patience and a lot of practice. As a beginner, stay away from uncooperative patients (babies and mentally handicapped) and those with significant corneal or lens pathology [1].

Starting with the right eye, shine the retinoscopy streak into the patient’s eye and move it from side to side. Determine if the light reflex in the patient’s pupil moves “with” or “against” motion. Rotate the axis of the streak and look at the reflex in different meridians. If the reflex is of a consistent width and brightness all around, then there is no astigmatism. However, if the reflex looks thicker/thinner or brighter/dimmer when varying the axis of your streak, then there is astigmatism to correct as well.

What if there is astigmatism? As you move the streak from side to side, the reflex will appear to move obliquely. Rotate the beam until it is parallel with the reflex motion. Neutralize the “with” or “against movement” you see here. The secondary meridian is 90 degrees away and is at the axis of the patient’s astigmatism. Neutralize the “with” or “against movement” in this second meridian to find the cylindrical power. Do the exact same procedure with the left eye. Don’t forget to subtract your working distance before writing the prescription. Congratulations, you are finished with retinoscopy.

Aim

The aim of this study is to find out the variation of axis before and after cycloplegic refraction in pediatric patient’s age 5 to 15 years.

Methodology

- **Study Design:** Observational and descriptive study
- **Study Settings:** Pediatric department
- **Study Duration:** 8 months of 2018

- **Sample Size:** 426 eyes
- **Sampling Techniques:** Non probability technique.

Sample selection

- **Inclusion criteria:** Male and female age 5 to 15 years, and All patient having symptoms of headache complain of decrease vision.
- **Exclusion criteria:** Having astigmatism less than 0.50 DC, those who does not give consent, and Those patients who are mentally disable.

Data collection materials

First patient had to registered at reception than Visual Acuity was took by different Snellen chart after than objective (Auto-refractometer and retinoscopy) refraction performs an refer for Cyclopentolate refraction, after than subjective refraction done through using of trial box, the data was collected.

Results

A total of 426 eyes were recruited and examined, who lay in our criteria of age refractive status, and their refractive errors corrected. The type of astigmatism has been identified by auto-refractometer both before and after instilling the drops of cyclopentolate, and the comparison has been made on the basis of auto-refractometer readings.

Age	Percentage	Gender	Frequency	Percentage
5-10 years	63%	Male	238	55.9%
10-15 years	37%	Female	188	44.1%
Total	100%	Total	426	100%

Table 1

Findings before instilling cyclopentolate readings

Refractive error	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Simple myopia	36	15.1%	22	11.7
Simple hypermetropia	25	10.5%	23	12.2
Compound myopia	68	28.5%	48	25.5%
Compound hypermetropia	51	21.4%	42	22.3%
Mixed astigmatism	30	12.6%	20	10.6%
No astigmatism	28	11.7%	33	17.5%

Table 2

Findings after instilling cyclopentolate readings

Refractive error	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Simple myopia	15	6.3%	9	0.04%
Simple hypermetropia	16	6.7%	14	7.4%
Compound myopia	41	17.2%	33	17.5%
Compound hypermetropia	101	42.4%	86	45.7%
Mixed astigmatism	27	11.3%	18	9.5%
No astigmatism	36	15.1%	28	14.8%

Table 3

Variation of axis

The variation of axis after cycloplegic refraction before and after cycloplegic refraction more than 5` degrees.

Variation of axis > 5 degree	Frequency	Percentage
Yes	293	68.7%
No	133	31.3
Total	426	100%

Table 4

Discussion

Cycloplegic refraction is choice for children and young adults in which cyclopentolate is used to relax the accommodation and manifest the latent refractive error, patients who have active accommodation uses their accommodation to clear vision.

Astigmatism is refractive error in which patients have symptoms of headache, ocular pain, and asthenopia, to manifest the true amount of astigmatism cycloplegic refraction is recommended, cycloplegic refraction manifests the true amount of astigmatism and but this also changes the true axis of astigmatism, it's often said that variation of axis can occur more than usual before and after cycloplegic refraction.

Conclusion

The study showed significant variation of refractive error and axis before and after cycloplegic refraction which was greater than 5 degrees.

The major shift was compound myopic astigmatism into compound hypermetropic astigmatism.

Recommendation

On the basis of the findings of this study, it is highly recommended that the prescription should be given after the post mydriatic test to check whether the patient is accepting that axis or not.

Otherwise, wrong axis given to the patient cause asthenopia symptoms to the patient and compromise the visual comfort.

Bibliography

1. Clinical Ocular Pharmacology, 5th edition, Bartlett. Chapter 9: Cycloplegics. Table 9-1: Mydriatic and Cycloplegic Properties of Anticholinergic Agents (2008): 127.