



EFFECT OF CYCLOPLEGIC REFRACTION ON INTRAOCULAR PRESSURE IN CHILDREN

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ABSTRACT **INTRODUCTION:** Children undergoing routine examination for refractive error should undergo cycloplegic refraction for a better assessment of the refractive error. Cycloplegic refraction done in children using tropicamide and cyclopentolate causes an elevation of Intraocular pressure in susceptible patients with or without narrow angles
AIM: To study the effect of cycloplegic mydriasis with 1% cyclopentolate and 1% tropicamide on the intraocular pressure (IOP)
MATERIALS AND METHODS : The study was done in the Department of ophthalmology of a tertiary care hospital. 60 eyes of 30 children in the age group of 8- 14 years coming to the OPD for examination of refractive error were studied. Their pupil was then dilated using one drop of 1% cyclopentolate followed by 1% tropicamide followed by another drop of 1% cyclopentolate. IOP was then measured 30 mins after instillation of cyclopentolate
RESULTS: The mean pre cycloplegic IOP in all eyes was 16.25 ± 2.04 mmHg and the post cycloplegic IOP was 17.68 ± 2.47 mmHg with a p value of 0.017 which was significant.
CONCLUSION: IOP should be cautiously monitored for changes in children coming for ocular examination while using cycloplegic drugs as they cause an increase in the intraocular pressure.

KEYWORDS : Intraocular pressure, cycloplegic refraction , children

INTRODUCTION

It is important to carry out cycloplegic refraction for young children during examination for refractive error. Cycloplegia for refractive error examination is commonly achieved by using a combination of tropicamide and cyclopentolate. This combination can provide satisfactory mydriasis and cycloplegia in 20 minutes (1). However, cycloplegic agents can induce a significant increase in intraocular pressure (IOP) in the susceptible patients with or without narrow angles (2)

MATERIALS AND METHODS

The study was done in the Department of ophthalmology of a tertiary care hospital. 60 eyes of 30 children in the age group of 8- 14 years coming to the OPD for examination of refractive error were studied. Written informed consent of each patient and guardian was taken .Detailed history and slit lamp examination of the children was done. Intraocular pressure was measured using applanation tonometer. Their pupil was then dilated using one drop of 1% cyclopentolate followed by 1% tropicamide followed by another drop of 1% cyclopentolate. IOP was then measured 30 mins after instillation of cyclopentolate

RESULTS

In this study , we studied 60 eyes of 30 patients in the age group of 8-14 years . Out of these 40 were hypermetropes and 20 were myopes . The mean pre cycloplegic IOP in all eyes was 16.25 ± 2.04 mmHg and the post cycloplegic IOP was 17.68 ± 2.47 mmHg with a p value of 0.017 which was significant. In the hypermetropic eyes , the pre and post cycloplegic IOP was 16.88 ± 1.70 mmHg and 18.58 ± 2.08 mmHg respectively with a p value of 0.007 which is significant. The precycloplegic and postcycloplegic IOP in the myopic eyes was 15.22 ± 2.18 mmHg and 16.22 ± 2.38 mmHg respectively which was insignificant (p value-0.34)

DISCUSSION

In normal and open-angle glaucomatous eye, cycloplegic refraction can cause an elevation of IOP (3). One of the possible mechanism for elevation of IOP after cycloplegic mydriasis has been related to decreasing aqueous outflow resulting from decreased traction on the trabecular meshwork due to ciliary muscle paralysis (4). Releasing of iris pigment into the anterior chamber and obstruction of the trabecular meshwork is thought to be another mechanism for IOP elevation after cycloplegic refraction (5). Pupillary block is also thought to be responsible for IOP elevation. Harris et al² found that a narrow angle was a crucial factor that predisposed patients to acute IOP elevation. Tsai et al (6), In one study of healthy children for annual eye examinations, found that the mean anterior chamber angle, anterior chamber depth, and anterior chamber volume significantly increased

following mydriasis in myopic and emmetropic eyes, but they could not find a significant change of IOP after mydriasis. A pressure elevation of 6 mmHg or more was found in 1-2% of healthy persons after pupil dilation with 1% cyclopentolate.(3). According to Hung KC, in very young and relatively high hyperopes, the severe tonic spasm of accommodation persists and the pupil size maintains the nearly mid-dilated position, which accompanied by a relatively shorter axial length would cause an IOP elevation after cycloplegic mydriasis(7).

In the present study , we found an IOP elevation in hypermetropes after administration of cyclopentolate and tropicamide . The majority of the IOP changes were no more than 5 mmHg . A confounding factor for IOP measurement is the central corneal thickness in adults, however, its role in the IOP changes of children is not obvious. Further studies can be carried out to address the relation between CCT and IOP changes with cycloplegic agents.

In the present study, the CCT , anterior chamber depth and lens thickness was not measured and therefore their effect on IOP in this case could not be studied . A few other limitations were a small sample size and a lack of control group

CONCLUSION

Mydriatics and cycloplegics are routinely used in children who come for ocular examination and refractive error correction. In such children IOP should be cautiously monitored for changes while using cycloplegic drugs as they cause an increase in the intraocular pressure.

	Pre Cycloplegic IOP	Post cycloplegic IOP
All eyes	16.25 ± 2.05 mmHg	17.68 ± 2.47 mmHg
Hypertropia	16.88 ± 1.7 mmHg	18.58 ± 2.08 mmHg
Myopia	15.22 ± 2.18 mmHg	16.22 ± 2.38 mmHg

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