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Comparison Study for Refractive Outcome With and without 1% Tropicamide plus Eye Drop

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Abstract
Background: *To investigate the age range for which cycloplegia provides additional information*
Aims and Objectives: *1. Assess the effect of 1% Tropicamide use on the of refraction examination results with auto-refractometer 2. To investigate the age range for which cycloplegia provides additional information compared with non-cycloplegic refraction in teenagers and young adults*
Materials and Methods: *Prospective interventional study with100 patients who presented to the Department of Ophthalmology of a tertiary care center were evaluated for cycloplegia.*
Conclusion: *Steeper correlation between the change in cycloplegic refraction and final post cycloplegic refraction for those aged 19 years or younger compared with those aged 20 years or older*
Keywords: *cycloplegia, refraction, auto-refractometer.*

Introduction

Refraction is imperative to a comprehensive eye examination. It provides relief to one of the most common physical defects giving improved quality of life to the patient. It varies depending on the accommodative status of the patient. In a clinical environment, subjective refraction produces a more accurate and acceptable spectacle prescription than an autorefractor.[1]

Cycloplegic agents inhibit amplitude of accommodation and aid in determining the baseline refractive status of the eye. Inadequate cycloplegia can lead to an overestimation of myopia or an underestimation of hypermetropia. Autorefractors have been found to be accurate under cycloplegic conditions. [2]

Aims and Objectives

1. Assess the effect of 1% Tropicamide use on the of refraction examination results with auto-refractometer
2. To investigate the age range for which cycloplegia provides additional information compared with non-cycloplegic refraction in teenagers and young adults

Method of Study

We conducted a prospective interventional study among 100 patients who presented to the Department of Ophthalmology of a tertiary care centre.

Inclusion Criteria

- Age group 13-26years

Exclusion Criteria

- Undergone cataract or refractive surgery
- Signs of anterior segment disease
- Patients with Best Corrected Visual Acuity < 6/60 or near vision<N12
- Patients suspected to have ciliary muscle spasm

All patients were evaluated for cycloplegia. Subjective examination was carried out first with the natural pupil size pupil. Then objective examination was carried out using auto-refractometer with the natural pupil size and after a single tropicamide drop. The error of auto-refractometer examination was determined as the difference of this result and the result of the subjective examination [3]

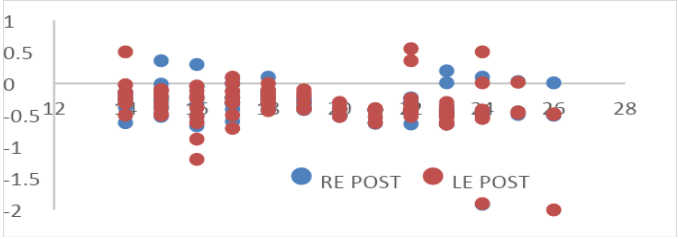
Results

The mean pre-cycloplegic refractive error was -0.55+/-0.52D and -0.44 +/-1.27 D for right and left eyes, respectively.

The mean post-cycloplegic refraction was -0.33 +/- 0.26 D and -0.36 +/- 0.56 D.

Overall, the mean difference between pre- and post-cycloplegic refraction (post minus pre) was 0.19+/- 0.52 D and 0.19+/-0.51 D for right and left eyes, respectively, indicating that post-cycloplegic refraction was generally more hyperopic/less myopic.

Stratified by age group, the mean difference (post minus pre) was 0.28 +/-0.51 D and 0.27 +/- 0.54 D for right and left eyes, respectively, in those aged 13–19 years and 0.094+/-0.50 D and 0.097+/-0.46 D in the 20–26 year old cohort. With increasing age, the mean difference between pre and post cycloplegic refraction (post minus pre) decreased.



X axis: Age (in years)

Y axis: Difference between Pre and Post-cycloplegic

Discussion

Precise and early assessment of eye refractive errors is crucial because undetected anisometropia and high hyperopia may lead to amblyopia and promote strabismus.[4] The basis for prescribing individual corrections comes from understanding the concepts used to identify and measure refractive errors. Our study found a steeper correlation between the change in cycloplegic refraction and final post cycloplegic refraction for those aged 19 years or younger compared with those aged 20 years or older. Previous studies have also showed that cycloplegia is not required in population estimates of refractive error for young adults once they reach approximately 20 years of age.[5]

Conclusion

Change in refractive error measured by autorefraction under cycloplegic conditions was more pronounced in participants younger than 20 years of age.

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