

A COMPARISON OF AUTOREFRACTOMETER WITH CYCLOPLEGIC RETINOSCOPY IN CHILDREN AGED 3 TO 15 YEARSJaishree Dwivedi¹, Sandeep Mithal², Charu Mithal³, Sweta Shrivatsava⁴**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: AIM: To compare the accuracy of the autorefractometer with traditional retinoscopy as a means of determining the approximate subjective refraction in children after cycloplegia. **MATERIAL AND METHODS:** Prospective observation study carried out in 72 eyes of 72 patients aged 3 to 15 years in upgraded department of Ophthalmology, LLRM Medical College, Meerut between April 2013 to June 2013. The negative spherical power of autorefractometer was higher than retinoscopic group. The positive spherical power was lower in autorefractometer. **DISCUSSION:** Our observations in this younger age group amply that the inbuilt automatic fogging system of the autorefractometer fails to neutralize adequately the patient's accommodative efforts during manifest refraction. **CONCLUSION:** Manual retinoscopy is still the most accurate technique to estimate refractive status in children.

KEYWORDS: Suppression, Amblyopia, Autorefractometer, Retinoscopy, Cyclopegia, Strabismus, Corneal Opacity, Cataract, Photophobia, Accommodative Efforts, Aphakia, Mixed astigmatism, Hyperopia, Myopia.

INTRODUCTION: Detection and correction of refractive errors in infants and children is very important for two reasons: to prevent irreversible vision loss secondary to suppression of a blurred or unfocused retinal image (Amblyopia), and to eliminate any visual impairment detrimental to the child's normal functioning in daily life.¹ However, even for an experienced retinoscopist, assessment of refractive error in the pediatrics population can be challenging.²

Automatic refractometer have become more important in recent years because of the busy clinical schedules of ophthalmologists and increasing faith of patients in sophisticated mechanical devices. Many such refractometers, subjective and objective, are now available, with steadily improving designs and greater claims to accuracy.

AIM: To compare the accuracy of the autorefractometer with traditional retinoscopy as a means of determining the approximate subjective refraction in children after cycloplegia.

MATERIAL AND METHODS: Study design-Prospective observational study.

Sample Size: 72 eyes of 72 patients.

Study Period: April 2013 - June 2013.

Study Center: Out-patient Dept. of Upgraded department of Ophthalmology, LLRM Medical College, Meerut.

Inclusion Criteria: Children 3-15 years of age, Cooperative child.

Exclusion Criteria: Child with strabismus, Corneal opacity, Cataract.

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OBSERVATIONS AND RESULTS:

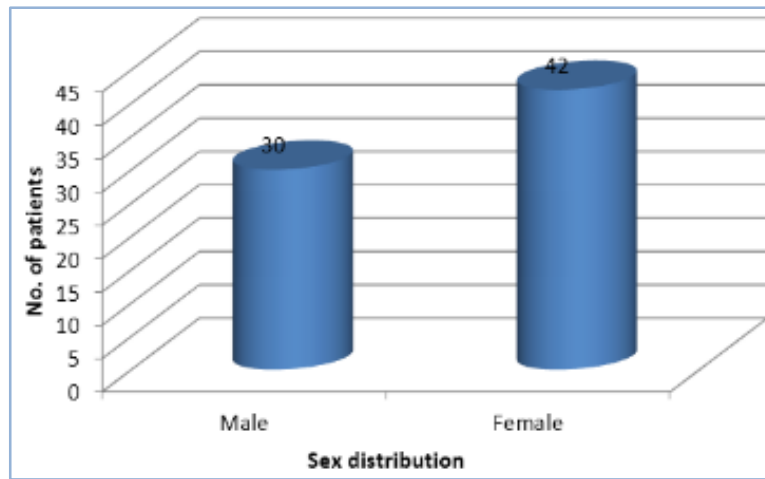


Table 1

Sl. No.	Symptoms	No. of Patients (%)
1	Headache	15(20.8%)
2	Photophobia	1(1.2%)
3	Foggy sight	10(13.8%)
4	Dizziness	2(2.4%)
5	Other symptoms	1(13.8%)
6	More than 1 symptom	18(25%)
7	Routine checkup	16(22.2%)

Table 2: Reasons of patients for attending ophthalmology department

- The mean age of the patients examined was 8.61 years (± 0.25).
- 30 patients were male (41.5%) and 42 were female (58.5%).
- Mean weight and height of the study group were 32.93 (± 1.1) kg and 128 (± 2.13)cm respectively.
- 26 patients (34.5%) in the study group had a medical history of non-ophthalmologic problems.
- Family history (first – and second-degree relatives) of refractive anomalies was positive in 37 (51.4%) of the children. The main reasons that these patients attended the Ophthalmology Department are shown in Table 2.
- Thirty for right eyes had negative spherical equivalent (refractions were in negative cylinder form, sphere was negative in all these patients). The sphere power in the autorefractometer (AR) group was significantly higher than in the cycloplegic retinoscopy (RC) group (-2.35×2.50 D Vs. -1.65 ± 2.6 D, $p=0.0001$).
- Thirty eight right eyes had positive spherical equivalent refractions were in positive cylinder form, sphere was positive in all these patients). The sphere power in the AR group was significantly lower than in the RC group (1.7 ± 1.80 D vs. 2.30 ± 2.10 D, $p=0.0001$).

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DISCUSSION: Our observations in this younger age group amply that the inbuilt automatic fogging system of the autorefractometer fails to neutralize adequately the patient's accommodative efforts during manifest refraction.³

This problem declines with increasing age over 40 years and hardly existed in aphakia, mixed astigmatism, and higher refractive errors – all conditions in which the patient did not wish to or could not accommodate significantly.⁴

Our autorefractive results under manifest conditions show that the difference is considerably higher than the known differences reported earlier by means of manual retinoscopy, which is the clinical standard.⁵

In our study the use of the autorefractometer without cycloplegia in children underestimated the true hyperopia and overestimated the true myopia.

CONCLUSION: We strongly suggest that automatic refractors should be used with greater caution when determining manifest refractions, especially in younger patients in whom accommodation is more active than in older patients, because significant instrument myopia may be induced by the device or the real hyperopia may be unrevealed.⁶

Manual retinoscopy is still the most accurate technique to estimate refractive status in children.

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