Reduced vision throughout early childhood is typically due to errors of refraction [1]. There are three main types of refractive errors: hypermetropia (farsightedness), myopia (near sightedness), and astigmatism [2]. According to WHO globally 314 million people are visually impaired, out of them 153 million are affected from untreated refractive errors [3]. In children risk of developing refractive errors are at a high rate due to their increased academic pressure and near visual tasks [4]. Frequency of error of refraction in children, is proved by means of uncorrected vision equivalent to or poorer than 20/40 and it differs from low to high. To eliminate the preventable blindness in children WHO urged a global initiative, VISION 2020-The right to sight [5, 6]. For inhibition of amblyopia in kids, it is very significant that a correct measurement of refractive error is done [7]. Goal of vision screening in infancy is to

**ARTICLE INFO**

**Key Words:** Refraction, Cycloplegia, Post Mydriatic

**How to Cite:** Tahir, A. ., Bibi, I. ., Akhtar , F. ., Jabeen, T. ., Arslan Ashraf, M., Yousaf, S. . & Anwar Faridi, T. . (2022). Comparison Of Subjective Refraction Under Cycloplegia Versus Post Mydriatic Refraction In Pediatric Population: Subjective Refraction under Cycloplegia Versus Post Mydriatic Refraction. Pakistan BioMedical Journal, 5(9).

https://doi.org/10.54393/pbmj.v5i9.781

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Received Date: 23rd August, 2022
Acceptance Date: 11th September, 2022
Published Date: 30th September, 2022

**ABSTRACT**

Reduced vision throughout early childhood is typically due to errors of refraction. **Objective:** To compare refractive status in children (age 5 to 15 years) checked with subjective refraction under cycloplegia versus post mydriatic test (PMT). **Methods:** Comparative cross-sectional study was conducted in pediatric ophthalmic clinic of College of ophthalmology and Allied vision sciences (Mayo hospital Lahore including 120 non-pathological eyes of 60 subjects. Individuals with nystagmus and deviation of eyes were excluded. Power of SE (P1) was taken as proposed number of glasses to be dispensed. After three days PMT was done and prescription of glasses with BCVA (P2) was noted and prescribed. At PMT (P2-P1) was noted and evaluated. All data entered and analyzed by using SPSS-23. P-value equal or less than 0.05 was taken as significant. **Results:** Among 120 eyes (n=120), the distribution of myopia was 57.5% and hyperopia was 42%. The mean age of 60 individuals (female: 35% and male: 65%) was 9.47 ± 2.50 years. Among 120 eyes (n=120), the distribution of myopia was 57.5% (n = 69 eyes) and hyperopia was 42% (n = 51 eyes). Interclass correlation: Two-way mixed effects model where people effects are random and measures effects are fixed. a. The estimator is the same, whether the interaction effect is present or not. b. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance. c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise. **Conclusion:** There was statistically significant difference of SE of SRC and PMT_SE in both myopic and hyperopic children in both cases. PMT was significantly less as compared to SRC, in hyperopic patients, this difference increases with the amount of hyperopia. PMT can be predicted from SRC with 98% accuracy in both myopic and hyperopic cases. With following given formula.

PMT = 0.77*CR.sph - 0.03 r=0.98 (Hyperopia)

PMT= 0.96*CR.sph - 0.03 r=0.99 (Myopia)

This study strongly negates the need for PMT as PMT can be strongly predicted from SRC.
distinguish numerous complaints causing visual imperfections[8]. Though calculation of refractive error in pediatric populace is right challenging even for a practiced optometrist [9]. Selection for amblyopia and amblyogenic hazards in youngsters, monitored by proper management, is effective in decreasing the incidence and severity of optical damage in grown person [10]. Cycloplegic refraction is a method that permits evaluation of an accurate refractive error by preventing accommodation [11]. Cycloplegia is compulsory; for satisfactory modification of refractive error, mainly in young kids and patients with accommodative esotropia or high hypermetropia demanding more accommodative power [12]. Lack of cycloplegia is related to slight overestimation of myopia and obvious mistakes in evaluation of incidence of emmetropia and hyperopia [13]. There is no consistent method of regulating non-cycloplegic refraction to approximate cycloplegic refractions as the amount of refractive error varies from individual to individual as well as the type of cycloplegic refractive error. Non-cycloplegic refraction is therefore tricky [14]. Cautious choice of cycloplegic drug is significant as it is harder to attain complete cycloplegia in kids with darker irides, so usually cyclopentolate 1% is suggested to bring about adequate cycloplegia [15]. Other drugs like, Tropicamide is also introduced, and however it does not fully obstruct accommodation in children [16]. Test performed after three days of cycloplegic refraction when the effect of cycloplegia and mydriasis is completely disappeared, is termed as PMT (post mydriatic test) which is subjectively refined spectacle prescription obtained under non-cycloplegic condition from the values obtained from cycloplegic refraction. As for PMT an additional appointment is required, patients assume it very difficult for them[17, 18].

METHODS

Comparative cross-sectional study was conducted on 120 non-pathological eyes of 60 subjects. Individuals with nystagmus and deviation of eyes were excluded. Refractive status was measured by cycloplegic retinoscopy. At the time of cycloplegic refraction the SE of retinoscopy was calculated. The eye was labeled as myopic if the SE was less than zero and hyperopic if it was more than zero. Patient came for cycloplegic refraction cycloplegia was done with cyclopentolate 1% eye drop, instilled thrice with the gap of 15 minutes. After 1 hour of last drop cycloplegic refraction was done, and SE was calculated. Power of SE (prescription 1, P1) was taken as proposed number of glasses to be dispensed. Three days after, PMT was done and prescription of glasses with BCVA (prescription 2, P2) was noted and prescribed. The difference between proposed prescription and actual required prescription at PMT (P2-P1) was noted and evaluated. The participants were distributed into myopic and hyperopic categories and data was analyzed for the both groups. All data entered and analyzed by using SPSS-23. Normality of quantitative facts was inspected with Shapiro Wilk test and paired sample t-test was done. Interclass correlation was find out in myopic and hyperopic patients. Bland-Altman plot was drawn. P-value equal or less than 0.05 was taken as significant.

RESULTS

The mean age of 60 individuals (female: 35% and male: 65%) was 9.47 ± 2.50 years. Among 120 eyes (n=120), the distribution of myopia was 57.5% (n = 69 eyes) and hyperopia was 42% (n = 51 eyes). Interclass correlation: Two-way mixed effects model where people effects are random and measures effects are fixed. a. The estimator is the same, whether the interaction effect is present or not. b. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance. c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

Figure 1: Bland Altman plot comparing difference between spherical equivalent of subjective refraction under cycloplegia and PMT

Figure 2: There was a significant difference in hyperopic eyes as P_value was ≤0.00%.
Discuss the evaluation of refractive error and the role of cycloplegic refraction.
be predicted in both type of refractive errors. In hyperopic children we can predict PMT from CR.sph with the help of formula:

\[
PMT = 0.77^{*}CR.sph - 0.03 \text{ with } r \text{ value of } 0.98
\]

In myopic children we can predict PMT from CR.sph with the help of formula:

\[
PMT= 0.96^{*}CR.sph - 0.03 \text{ with } r \text{ value of } 0.99
\]

**C O N C L U S I O N**

There was statistically significant difference of SE of SRC and PMT_SE in both myopic and hyperopic children in both cases. PMT was significantly less as compared to SRC, in hyperopic patients, this difference increases with the amount of hyperopia. PMT can be predicted from SRC with 98% accuracy in both myopic and hyperopic cases. With following given formula.

\[
PMT = 0.77^{*}CR.sph - 0.03 \text{ (Hyperopia)}
\]

\[
PMT= 0.96^{*}CR.sph - 0.03 \text{ (Myopia)}
\]

This study strongly negates the need for PMT as PMT can be strongly predicted from SRC.

**C o n f l i c t s o f I n t e r e s t**

The authors declare no conflict of interest.

**S o u r c e o f F u n d i n g**

The author(s) received no financial support for the research, authorship and/or publication of this article.

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