

Comparison between Subjective Examination to Objective Examination Streak Retinoscopy without Cycloplegic on Myopia Patients

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Abstract: ***Objective:** The examination for refractive error can be done subjectively and objectively. This study aim to comparing the result of refractive error correction in subjective examination to objective examination (streak retinoscopy) without cycloplegic on myopia. **Methods:** A prospective observational with cross sectional study was performed. The total sample number is 64 subjects with myopia, all of patients had their vision assessed and the corrected using the subjective examination and streak retinoscopy. Then, the result from both examination were compared and determined by using the refraction examination to obtain the best correction visual acuity (BCVA). **Result:** From 34 eyes on the right eye and 33 eyes on the left eyes had the same result for their refractive error correction ($p = 0.919$). There are 36 subjects (56.3%) that got the same result for their correction value and the best result for their vision correction (BCVA) from both refraction examination. **Conclusion:** There was differences between subjective and objective refraction but from the statistical there was no significant difference.*

Keywords: Myopia, Subjective Examination, Objective Examination (Streak Retinoscopy) without Cycloplegic.

1. Introduction

Correction of refractory correction can be done by subjective and objective examination. The subjective refraction examination is an eye exam (refraction) where there is cooperation between the patient and the examiner. The subjective refraction examination can be done by examining trial and error and snellen chart. The objective examination is a refraction examination in which the refraction results can be determined without relying on the input or response of the patient. Retinoscopy or also known as skiaskopi, is a way to find refractive error with method of neutralization.

According to WHO in Global Data on Visual Impairments 2010, it is mentioned that 285 million people in the world experiencing vision disorder with the most cause is refractive disorder that is not immediately overcome, which is about 43% and this causes the blindness of about 3%. Seang - Mei Saw et al., examined the prevalence of myopia in Sumatra to reach 26.1% with 0.8% weight of myopia. The prevalence of myopia is highest at age 21-29 years.

2. Method

This study is a prospective observational descriptive analytic with cross sectional measurement method. The study subjects were all patients who came to the Refraction Division of H. Adam Malik General Hospital Medan who was diagnosed with myopia from October to November 2016. The sample size was 64 people with age over 18 years. First, the patient's identity record that meets the sample selection criteria and then checks the visus with snellen chart. Followed by correction of refraction in patients with decreased visual acuity by using subjective refraction examination (trial and error). Then the refractory correction is performed on the patient with decreased vision

acuity using objective refractive examination (streak retinoscopy). Furthermore, compared the difference of myopia correction result of both examination and determined which refraction examination get best correction visual acuity (BCVA).

3. Result

Table 1: Characteristics of Patients with Miopia Refractive Abnormalities Based on Gender

Gender	n	%
Male	36	56.2
Female	28	43.8
Total	64	100

Table 2: Characteristics of Patients with Age-Based Refraction Abnormalities

Age	n	%
18 – 36	41	64.1
37 – 55	23	35.9
Total	64	100

Table 3: Correction of Refractive Dysfunction with Subjective Examination (Trial and Error) Based on Miopia Degrees.

Degree of Miopia	Subjective Correction				P Value
	OD	%	OS	%	
Light	49 eyes	78.1	51 eyes	79.7	0.0001
Medium	13 eyes	18.8	11 eyes	17.2	
Weight	2 eyes	3.1	2 eyes	3.1	
Total	64 eyes	100	64 eyes	100	

Table 4: Correction Result of Refractive Disorder by Objective Examination (Streak retinoscopy) Based on Miopia Degrees.

Degree of Miopia	Subjective Correction				P Value
	OD	%	OS	%	

Ringan	50 eyes	78.1	51 eyes	79.7	0.975
Sedang	13 eyes	20.3	12 eyes	18.8	
Berat	1 eyes	1.6	1 eyes	1.6	
Total	64 eyes	100	64 eyes	100	

Table 5: Comparison of Correction Result of Miopia Refractive Abnormalities by Using Trial and Error Examination and Objective Examination (Streak retinoscopy).

Subjective Correction Against Objective	Eyes				P Value
	OD	%	OS	%	
Spherical Equivalent Higher	16	25	18	28.1	0.919
Spherical Equivalent Lower	14	21.9	13	20.3	
Spherical Equivalent Same	34	53.1	33	51.6	
Total	64	100	64	100	

Table 6: Best Correction Visual Acuity with Trial and Error and Objective Examination (Streak retinoscopy)

Type of Examination	n	%
BCVA with Subjective Examination	14	21.9
BCVA with Objective Examination	14	21.9
BCVA with Subjective Inspection & Objective	36	56.3
Total	64	100

4. Discussion

In this study, retinoscopy examination performed did not use cycloplegic. The results of J. Jorge et al's study suggest that the comparison between the retinoscopy examination using cycloplegic and without cycloplegic results in a more negative correction of refractive abnormalities in examinations using retinoscopy by cycloplegic administration, suggesting that cycloplegic use has an effect on objective testing. Unlike the study Twelker and Mutti in 2001 compared the retinoscopy with cycloplegic and close-range retinoscopy (dynamic retinoscopy) in 29 infants, using a correction factor of 0.75 D as Saunders and Westall suggested. In this study obtained on closer retinoscopy examination found 0.97 D more myopia and higher than the retinoscopy with cycloplegic.

Table 1 shows that subjects of study of patients with refraction disorder most of myopia in men as many as 36 people (56.2%), while in women as many as 28 people (43.8%).

From table 2 above shows the subject of research of patients with most of myopia refraction disorder at age between 18 - 36 years counted 41 people (64.1%), while at age between 37 - 55 years as many as 23 people (35.9%).

Table 3 shows the results of Chi-Square Test $p < 0.05$, this illustrates there are differences in the results of subjective correction examination based on the degree of myopia in the patient's right and left eyes.

Table 4 shows the results of Chi-Square Test $p > 0.05$, this illustrates there is no difference of correction result of objective examination based on degree of myopia on right and left eye of patient.

Table 5 shows that the results of correction of refractive abnormalities by using subjective examination (trial and error) and objective examination (streakretinoscopy) showed

no significant difference from the correction result with both examinations. In line with research conducted by dr. Manjunath Natarajan in India in 2016, showed similar correction results obtained on examination using subjective examination and objective examination of retinoskopi. Use of subjective binocular retinoscopy and refraction is an easy examination technique when used in cases with large populations. The study was also in line with the American Academy of Optometry in 2006, which stated that the comparison of retinoscopy examination results with subjective refractive examination showed a statistically insignificant difference. This is also in line with a study conducted by Owens et al in 1980 stating the retinoscopy examination technique Mohindra showed a good correlation between retinal and cycloplegic examination in infants and children, and between subjective refractive examination and closer retinoscopy examination in adults. However, it was not in line with a study conducted by Chan and Edwards in 1994, Asian children suffering from myopia were corrected with refractive disorders by subjective examination and retinoscopy examination without cycloplegic administration. From the results of his research shows the results of correction of refractive abnormalities are higher than the subjective examination. Similarly, research conducted by Rabbetts in 2007 and Benjamin in 2006 showed that the result of correction of refractive abnormalities with retinoscopy examination is higher correlation than with subjective refractive examination.

Table 6 above shows that the subjects of the best corrected refraction of myopia (BCVA) corrected patients with trial and error were 14 (21.9%) and who received the best correction (BCVA) corrected by the objective examination (streakretinoscopy) alone was 14 people (21.9%), whereas with subjective examination (trial and error) and objective examination (streakretinoscopy) counted 36 people (56.3%).

5. Conclusion

There was differences between subjective and objective refraction but from the statistical there was no significant difference found for the myopia correction result between subjective examination to objective examination without cycloplegic. In this study, there was no conflict of interest.

The author suggested that retinoscopy is a monocular examination and should be compared with monocular examination as well, rather than compared with binoculars subjective refraction. However, in this study comparisons were made between subjective examination and objective examination using streak retinoscopy in order to determine whether there were differences in correction results obtained from both examinations and which examination gets the best corrected visual acuity (BCVA). In this study there were no significant differences from both examinations, this may be due to a limited number of samples. For further research is expected to increase the number of research samples to get more accurate results

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