Corellation Between Cup and Disc Ratio With High Myopia Optic Nerve

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Corellation Between Cup and Disc Ratio With High Myopia Optic Nerve

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ABSTRACT
Myopia is one of the most common refractive disordersand one of the risk factors for glaucoma, especially in myopia with 6.00 diopters or more (high myopia). In high myopia, it is often accompanied by abnormalities in the back of the fundus (posterior pollus) of the eyeball due to excessive stretching.

OBJECTIVE
To determine corellation between cup ratio and optic nerve disc with high myopia.

METHOD
This research is a non-experimental research with analytic observational method with cross-sectional study design. Subjects were male and female patients aged 15 - 60 years suffering from myopia more than -6.00 diopters (high myopia) at Kebumen Eye Center Clinic and Purbowangi Hospital Gombong. Data collection was carried out in January - August 2019. Eye examinations carried out were visual examination, refraction correction and funduscopic examination. Data analysis was performed by the Spearman Test and the correlation test.

RESULTS
The respondents in this study were 30 samples of high myopia men and women consisting of 14 men (46.7%) and 16 women (53.3%), with an average age of 33.07 ± 13.04 years. Mean refraction of right eye (OD / Ophthalmic Dextra) -10.72 ± 4.82 Diopters and left eye (OS / Ophthalmic Sinistra) -10.27 ± 4.52 diopters . The results of the correlation test using the Spearman Test showed no significant correlation (OD p = 0.115, OS p = 0.118) between the cup ratio and optic nerve disk with high myopia with weak correlation strength (ODS r = 0.29).

CONCLUSION
There is no significant correlation between cup ratio and optic nerve disc with high myopia

Keywords*: cup of disk ratio, high myopia*

Introduction

Myopia is a vision problem that is caused by an overly strong accommodation force from the refractory media of the eye or because the axis of the eyeball is too long, causing the focus of the shadows to fall in front of the retina. Most types of myopia are due to the axis of the eyeball that is too long (myopia axis). Every 1 mm axis lengthening will cause myopia 3 diopters (Hartono, 2006). Myopia is the most common refractive disorder. Myopia is a refractive disorder that can be one of the risk factors for glaucoma, especially high myopia. In high myopia (more than 6 diopters or extended axis more than 2 mm) often accompanied by abnormalities of the back of the fundus (posterior polus) eyeball due to excessive stretching. Some previous studies have shown that the optic nerve papillus with myopia can resemble the optic nerve papillary with glaucoma, especially in terms of the cup ratio and optic nerve disc (Leung CK, 2007; Eugene M, 2010; Hartono, 2006).

Examination of the fundus (posterior pollus) of the eyeball in high myopia can be found in the expansion of the cup ratio and optic nerve papillary disc, which can cause the appearance of normal pressure glaucoma or even low pressure glaucoma, changes in the position and slope of the optic disc, depigmentation around the optic disc, so that it appears thinning sclera and retina, images of myopic crescent, conus myopicus, posterior staphyloma, and thigroid degeneration in the optic and retinal nerve papules, macular degeneration, macular holes, macular bleeding, even retinal detachment, changes in the glassy body in the form of melting resulting in turbidity such as optic and retinal nerve papules, macular degeneration, macular holes, macular bleeding, even retinal detachment, changes in the glassy body in the form of melting resulting in turbidity such as optic nerve and retinal nerve or threads (floaters) felt by the patient. The formulation of the problem in this study is whether there is a relations between cup ratio and optic nerve disc with high myopia.

The purpose of this study was to determine the correlation between cup ratio and optic nerve disc with high myopia.

MATERIALS AND METHODS

This study is a non-experimental observational analytic method with a cross-sectional study design. The study was conducted at the Kebumen Eye Center Clinic and Purbowangi Gombong Hospital, the period January 2019 to August 2019. The study population was all high myopia patients (more than -6 diopters) aged 15-70 years at Kebumen Eye Center Clinic and Purbowangi Gombong Hospital. The study sample taken in this study were all myopia patients who met the inclusion criteria. Exclusion criteria in this study were patients who had undergone eye / laser eye surgery procedures, patients with opacified refractive media or other eye diseases that affected the retina and optic nerve papillae and female patients who were pregnant.

RESULTS

In this study, 30 respondents collected male and female research samples with criteria of suffering from high myopia> -6.00 diopters. Respondents consisted of 14 men (46.7%) and 16 women (53.3%),

with an average age of 33.07 ± 18.04 years. Patients suffer from right eye refraction (OD / Ophthalmic Dextra) with a mean of -10.72 ± 4.82 Diopters and left eye (OS / Ophthalmic Sinistra) with a mean of -10.27 ± 4.52 diopters. The frequency distribution of samples according to age and sex is as follows in table 1.

Table 1. Distribution of sample frequencies by age

Age category	Frequency	Percentage (%)
< 20	12	40
20 – 40	5	16,7
>40	13	43,3
Total	30	100

Table 2. The frequency distribution of the sample by gender

Gender	Frequency	Precentage (%)
Male	14	46,7
Female	16	53,3
Total	30	100

Table 3. The frequency distribution of refractive disorders (high myopia)

Refractive disorders (diopters)	OD	OS
-6,00 sd -10,00	20 (66,7%)	21 (70%)
-11,00 sd -15,00	5 (16,7%)	4 (13,3%)
-16,00 sd -20,00	4 (13,3%)	4 (13,3%)
-21,00 sd -30,00	1 (3,3%)	1 (3,3%)
Total	30 (100%)	30 (100%)

Table 4. Frequency distribution ratio of the cup and the optic nerve disc

Ratio cup and disk nervus opticus	OD	OS
0,3/0,3	26 (86.7%)	26 (86,7%)
0,4/0,4	2 (6,7%)	2 (6,7%)
0,5/0,5	1 (3,3%)	2 (6,7%)
0,6/0,6	1 (3,3%)	0 (0%)
Total	30 (100%)	30 (100%)

Figure 1. Female patient, age 25 years, spherical OD refraction abnormalities -19.00 and spherical OS -18.00 with an ODS CD ratio of 0.3 / 0.3, images of the crescent myopic fundus and retinal degeneration.

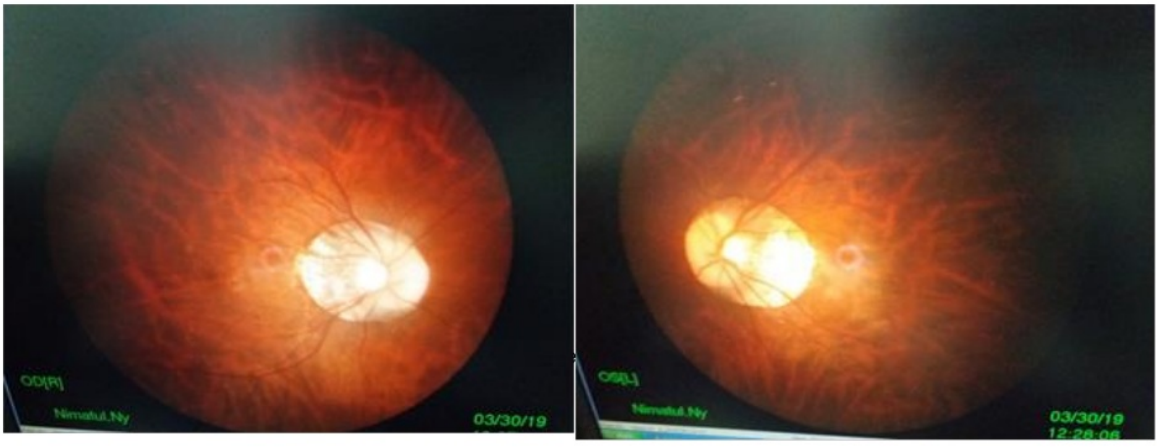
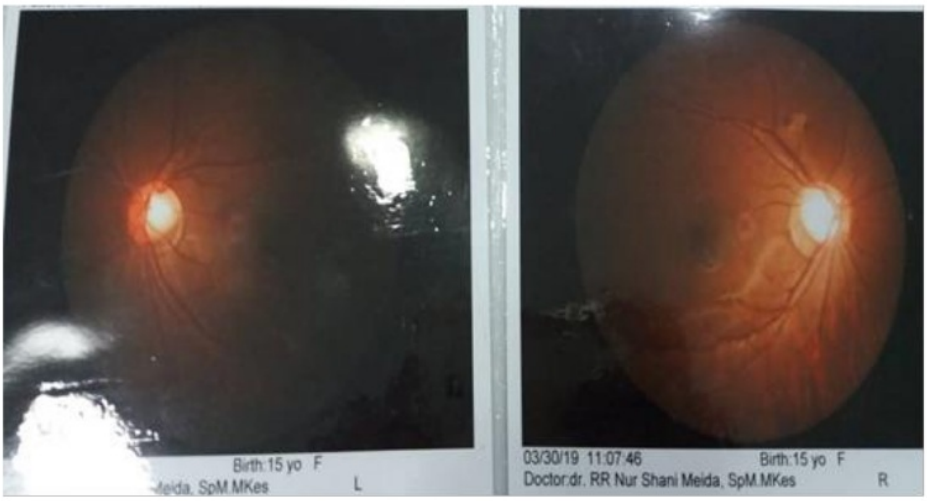


Figure 2. Female patient, age 13 years, spherical OD refraction abnormalities -10.5D, spherical OS -9.25 D with a CD ratio of 0.6 / 0.6 suspected glaucoma



The results of the correlation test using the Spearman Test showed that there was no significant correlation (p> 0.01) between the cup ratio and optic nerve disk with high myop with weak correlation strength (r = 0.29).

DISCUSSION

This study reports that there is no significant relationship between cup of disk ratio and high myop with weak correlation. This shows that it is not automatically that patients suffering from high myopia will have a dilated cup of disk ratio. In this study it was proven that there was a patient with a very high myop ie -19.00 D but the cup of disk ratio was still within normal limits. The results of this study differ from some previous studies which said that high myopia was a risk factor for glaucoma (with a dilated cup of disk). Some literature says that myopia is one of the risk factors for glaucoma. Some previous studies have explained that the optic nerve papillus with myopia can resemble the optic nerve papillary with glaucoma, especially in terms of the cup ratio and optic nerve disc (Leung CK, 2007). Other studies report that even mild myop can be a risk factor for glaucoma. Suzuki and colleagues (2002) observed that narrow-angle and open-angle glaucoma was found in the correction refraction average of -2.12 diopters. Davenport's research (1999) conducted on 1500 glaucoma sufferers found 316 patients had 3 diopters refraction abnormalities. Zolog and colleagues (2002) found that glaucoma occurred in myopia <6 diopters. The presumption from Friedman (1994) that the role of myopia as a risk factor in glaucoma has been investigated but the results cannot yet be explained. Perkins and Phelps in one study said that myopia eyes were more susceptible to the effects of increased intraocular pressure compared to non-myopia eyes and thus became a risk factor

for glaucoma. Glaucoma that results from refractive abnormalities is related to the anatomy of the eyeball. In myopia, the patient's eyeballs will increase in length and cause an increase in intraocular pressure (IOP) (bowling, 2015).

CONCLUSION

There is no significant relations between cup ratio and optic nerve papillary disc with high myopia.

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REFERENCES

1. American Academy of Ophthalmology.2015-2016.*Clinical optics. Basic Clinical and Science* Course Sect.3. AAO-San Francicso.
2. Balitbangkes Kemenkes RI. 2013. *Pokok pokok Hasil Riskesdas Provinsi Daerah Istimewa Yogyakarta 2013*. Jakarta : Lembaga Penerbitan Badan Litbangkes.
3. Bowling, brad. (2015). kanki's clinical ophthalmology, 928.
4. Dahlan, S., 2009.*Besar Sampel dan Cara Pengambilan Sampel dalam Penelitian Kedokteran dan Kesehatan*, 34-39. Salemba Medika. Jakarta.
5. Friedman, e. (1994). aging changes of the sclera. *Wb Saunders Co*, 726–727.
6. Hartono. 2006. *Diktat Refraksi*. Yogyakarta: Badan Penerbit Fakultas Kedokteran Universitas Gadjah Mada.
7. Helveston, E.M., Smallwood, L.M. 2010. *Vision and Refraction.* ORBIS Telemedicine.
8. Ilyas, H.S. & Yulianti, S.R., 2015. *Ilmu Penyakit Mata.(Edisi Kelima ed).* Jakarta: Badan Penerbit Fakultas Kedokteran Universitas Indonesia.
9. Jin Young Lee, Kyung Rim Sung, Seung Hau. Jung Hwa Na, 2015, Effect of Myopia on the Primary Open Angle Glaucoma, *Invest Ophthalmol Vis Sci*. Vol 56 (3): 1775-1781.
10. Jonas J.B., Webwe P., Nagaoka N., Ohno-Matsui K, 2017, Glaucoma in High Myopia and Parapapillary Delta zone, *Plos One*, Vol 12 (4), e0175120.
11. Leung, C.K., Cheng, A.C.K., Chong, K.K.L., Leung, K.S., Mohamed, S., Lau, C.S.L.. et al. 2007. Optic Disc Measurements in Myopia with Optical Coherence Tomography and Confocal Scanning Laser Ophthalmoscopy. *Invest Ophthalmol Vis Sci*. 48: 3178-3183.
12. Mery Qin, Sophia Y.Wang., Kaldev Singh, Shan C.Lin, 2013, Association Between Myopia and Glaucoma in United Stated Population, *Invest. Ophthalmol. Vis. Sci.*, vol. 54 (1) : 830-835.

13. Natsuko Nagaoka, Jost B.Jonas, Kei Morohoshi, Muka Moriyame, Noriaki Shimadu, Takeshi Yoshida, Kyuko Ohno-Matsui, 2015, Glaucomayout Type Optic Disc in High Myopia, *Plos One*, Vol 10 (10):e0138825.
14. Raluca Eugenia, D. Costin, 2018, High Myopia and Glaucoma A Challenge in Diagnosis, Review, *Medical Surgical Journal* , Vol. 122 (4).
15. Ramrattan, R.S., Wolfs, R.C., Jonas, J.B., et al. 1999. Determinants of Optic Disc Characteristics in a General Population: The Rotterdam Study. *Ophthalmology*. 106: 1588-1596.
16. Sheng-Ju Chen, Peng Lu, Wen-Fang Zhang, Huan-Lu, 2012, High Myiopia as a Risk Factor in Primary Open Nagle Glaucoma, *Int. J.Ophtalmol*. Vol 5 (6) : 750-753.
17. WHO. 2007. *VISION 2020 the Right to Sight. Global Inisiative for the Elomination of Avoidable Blindness*. Action Plan 2006-2011. France:WHO Library.

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