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Research Article

## A STUDY OF FUNDUS STATUS IN MYOPIA

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### ABSTRACT

**Background:** The most important sensory organ for a human is the eye. Any damage to the retina can cause diminution or loss of vision. One of the most important refractive errors of the eye is Myopia apart from hypermetropia and astigmatism. It is one of the commonest conditions seen in everyday practice. Myopic degeneration is one of the common causes of decreased visual acuity. **Aim:** The aim of this clinical study is to observe the fundus changes associated with Myopia. **Methods:** A prospective study of 100 cases of myopia were included in this study. Detailed anterior segment and good posterior segment examination after achieving mydriasis was done with a direct ophthalmoscope and indirect ophthalmoscope with 20D lens. **Result:** In our study, we found that males were more commonly affected than females with myopia (54%). 50% of the cases affected belonged to the student community. 53.68% had positive changes in the retina suggestive of degenerative changes in the fundus. **Conclusion:** Degenerative changes of fundus are most commonly seen in myopic patients of which Tessellated fundus was about 90.20%. Vitreous degenerative changes for 70.59%. Crescent formation was 87.25%. Dull foveal reflex in 82.35% and lattice degeneration accounted for 40%.

**Keywords:** Myopia, Vitreous degeneration, Lattice degeneration, White with and without pressure, tessellated fundus, Foveal reflex.

### INTRODUCTION

The Greek word Myopia means to close or contract the eye. Myopia (Ancient Greek:  $\mu$  , mu pia, from myein "to shut" – ops (gen. opos) "eye".<sup>1</sup> Myopia is one of the most common type of refractive errors and one of the commonest conditions seen by an Ophthalmologist. When the accommodation is at rest, parallel rays of light from beyond are focused at the sensitive layer of the retina, then the eye is in Emmetropic state (optically normal eye).<sup>2,3</sup>

Myopia or short sightedness is a type of refractive error, when the accommodation is at rest the parallel rays of light from infinity falls in front of the retina. The image thus formed is a blurred image. For a

person to see clearly the object should be brought close to the eye. A divergent lens which is placed in front of the eye can bring the parallel rays of light to be focused on the retina.<sup>1-3</sup>

It is said that as the Intelligent quotient of a person increases, myopia steadily increases and there has been many studies to support it.<sup>4-6</sup> The incidence of Myopia is more in the Asian population when compared to European, United States and least in Africans.<sup>4,7-9</sup>

Etiology of Myopia can be hereditary, chromosomal, congenital, environmental, drug induced and ocular disorders. The clinical variants of myopia are

Congenital myopia, Simple or developmental myopia, Pathological or degenerative myopia and Acquired Myopia. Simple myopia is very common. It stabilizes by the age of 21years and usually the prognosis is good.<sup>2,3,10,11</sup>

Various degenerative changes are seen in a myopic fundus, these changes are associated with the grade of myopia, age, gender. Peripheral retinal degenerations, lattice degenerations, white with and without pressure, Foster Fuchs spots, Lacquer cracks and optic disc changes are some of the common findings in the retina. Older patients are at risk of developing macular hole and later retinal detachment.

### MATERIALS AND METHOD

The present study was carried out in the Department of Ophthalmology at Meenakshi Medical College and Hospital, Kanchipuram. In this study a total of 100 patients were taken, 54 males and 46 females of the age group 8years to 70 years. All degrees of myopias were included. Prior to the study an informed consent form from the patients and ethical clearance was obtained from the Institutional Ethics Committee.

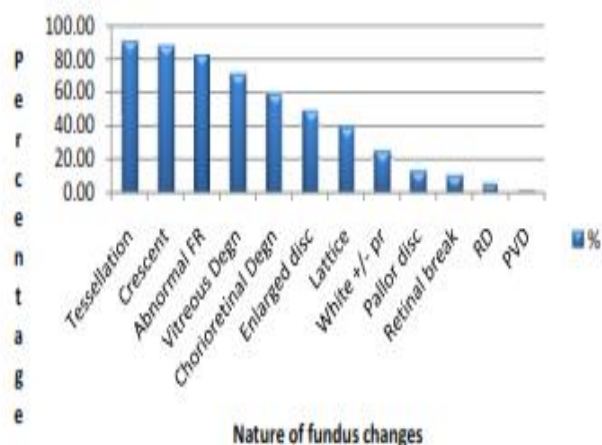
Exclusion Criteria: Age group less than 8 years and more than 70 years were not included. Emmetropes (non myopes) were not taken into this study. Patients with Ocular conditions like Glaucoma and Corneal degenerations, Patients with history of Diabetes and Hypertension were excluded.

**Type of study:** A cross sectional descriptive study for a period of 12 months.

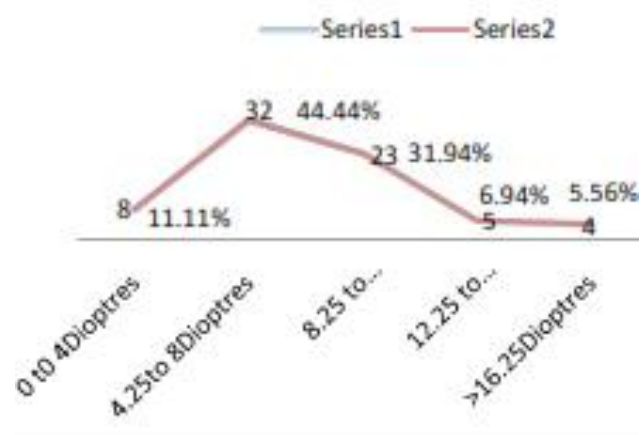
**Procedure:** A detailed case history was taken, in view of heredity contribution in myopias. Visual acuity was noted with the help of Snellens chart.<sup>12</sup> Best corrected visual acuity was given using streak retinoscope.<sup>12</sup> A detailed slit lamp examination of the anterior segment was done. Intra ocular pressure was recorded with the help of Schiottz Tonometer.<sup>12</sup> Mydriasis achieved with the help of tropicamide and phenylephrine combination. Fundus examined in detail with a help of Direct Ophthalmoscope and Binocular Indirect Ophthalmoscope with 20D lens. The media, disc, vessels, cup disc ratio, macula and peripheral retina were examined with a help of scleral indentation method.

### RESULTS

The distribution of Myopia was higher in the age group of 11-20years. The distribution of Myopia was more in Males. The distribution of Myopia was more in the student community. 8% of the cases had a positive family history of Myopia. 90% showed bilateral Myopia (180 eyes) and 10% showed unilateral myopia (10 eyes). 53.68% (102 eyes) showed fundus changes while 46.32% (88 eyes) were normal. Tessellated fundus (90.2%) with Crescent formation (87.25%) and Abnormalfoveal reflex (82.35%) was seen in most myopic eyes. Vitreous degeneration, lattice degeneration, White with and without pressure and Retinal detachment was more in the range of 4-8Dioptres. 30.77% showed chorioretinal degeneration in the range of 8-12Dioptres and was more in the older age group.

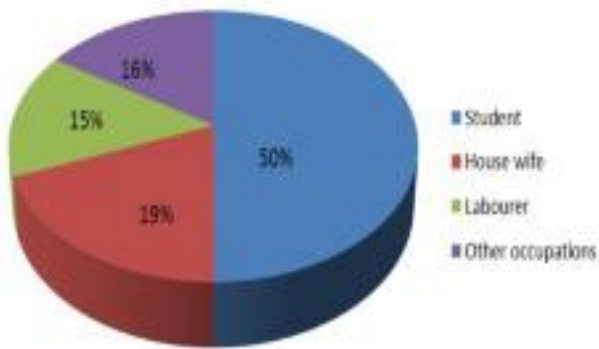


**Fig 1: Distribution of various types of Fundus changes**

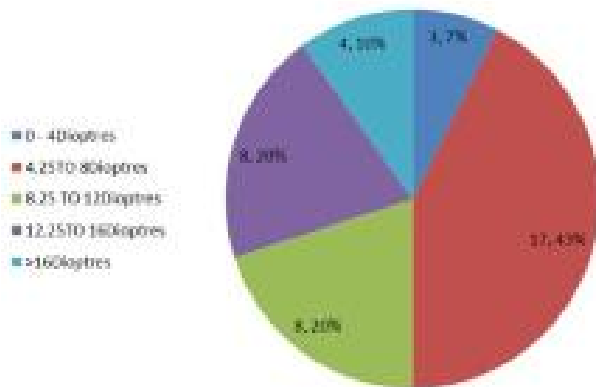


\*Series 1: No of eyes, Series2: distribution of vitreous haemorrhage

**Fig 2: Distribution of Vitreous Degeneration in Myopia**

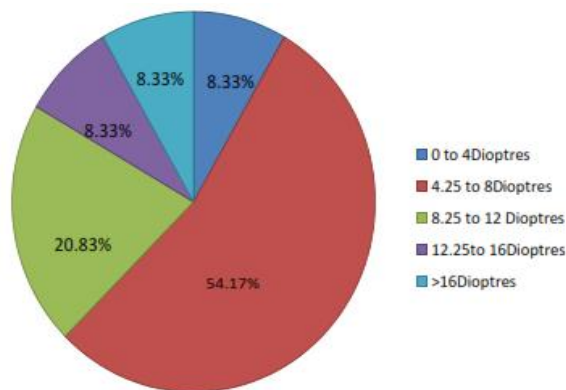


**Fig 3: Distribution on occupation**



First number indicates the no of eyes and the second number represents the % of diistribution of lattice degeneration

**Fig 4: Distribution of Lattice degeneration in Myopia**



Number inside the figure indicates the percentage of distribution

**Fig 5: Distribution of white with and without pressure and the range of Myopia**

## DISCUSSION

Our finding of 53% of bilateral lattice degeneration was similar to the results of Subedi S.<sup>11</sup> (45.8%) and Karlinet al (40%). Most of the lattice lesions in our study were found to be in the superior temporal quadrant, although other quadrants were involved. This is probably due to the excessive stretching and increased vascularity of this area.<sup>3,11</sup> Similar results

of higher distribution of lattice degeneration was observed by others too, in the myopic range of 4-8Dioptres. Our study further showed the tendency of decreasing lattice with increasing myopia of > -15Dioptres. It can be explained, on the basis of Yaras' finding, that in high myopic eyes with posterior staphyloma, the lattice is significantly less than the entire elongated eyes.<sup>3,11</sup> Patients aged 30-40 years were most frequently affected by lattice degeneration which was similar to the finding by Subedi S.<sup>11</sup>

On the edge of the lattice, vitreous adhesions are commonly seen and this accounts for the association of retinal detachment with lattice. This is more commonly seen in patients with moderate myopia.<sup>13</sup>

The distribution of Myopia was high among the student community. This may be because they were symptomatically aware of the refractive error. Intelligence and myopia are directly proportional to each other. When a child reads more the chances of elongation of the growing eyeball is also increased. In case of children with more outdoor activities and sports the chances of myopia are decreased. However Genetics have a very important role to play in myopia.<sup>14-17</sup>

Our study also showed that myopic crescent was seen in eyes with all grades of myopia. Enlargement of optic disc was seen in moderate to higher grades of myopia.

Tessellated fundus accounts for nearly 90.20% in our study. This is mainly due to atrophy of the retinal pigment epithelium wherein the underlying choroidal vessels are clearly seen<sup>18</sup>.

Vitreous floaters were seen in 70.59% of eyes. This is due to the vitreous degeneration in myopes<sup>3</sup>. The various studies done showed that the onset of vitreous degeneration and degree of myopia has a close association. In this study young patients with a higher degree of myopia had vitreous degeneration and an increased chance of retinal breaks<sup>13</sup>.

Retinal breaks accounted for 9.80% in our study. It is essential to find retinal breaks as it is very difficult to visualize. It acts as a predisposing factor for retinal detachment to occur<sup>3</sup>. Retinal detachment was 8.82% in our study and most of it occurred in young patients.<sup>19</sup> 3 out of 9 patients, who came, presented with Total Retinal Detachment. The distribution was more in myopes with 4-8D.

Therefore, it is essential to diagnose retinal holes; retinal breaks in the early stages. A good peripheral examination of the fundus is required as these conditions are more common in the periphery. Young adults are more commonly affected.<sup>20</sup> Eyes with posterior staphyloma are more commonly affected with macular hole retinal detachment.<sup>21</sup> Treatment is mostly surgical even though the success rates are less. Scleral buckling and Pars planavitrectomy are the options to be considered.<sup>22,23</sup>

6.3% of patients had lenticular opacity. Common type seen was posterior polar cataract.<sup>24</sup>

## CONCLUSION

It should be mandatory that fundus of all myopic patients must be examined as a routine in the Out Patient Department with good mydriasis as many degenerative conditions can be overlooked. Tessellated fundus accounts for 90.20% and abnormal foveal reflex for 82.35%. These were the most common conditions observed apart from the degenerative changes. In case of hazy view due to Lens changes in elderly people a B mode ultrasonogram should be done to rule out Posterior vitreous detachment and Retinal detachment. Effective reduction of visual impairment is available with optical correction by spectacles, contact lenses, and refractive surgery.

**Limitations of the study:** To identify the genetic variants through genome-wide association studies and **exome** sequencing of rare alleles, as well as more intensive investigation of gene-environment interactions, may assist in the identification of high-risk children who could benefit from interventions to prevent progression to high myopia.

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**Conflict of interest: None**

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