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CLINICAL PROFILE OF MYOPIA IN ADULT PATIENTS AT A RURAL TERTIARY CARE HOSPITAL.

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ABSTRACT

Introduction: Myopia, also known as short sight is that dioptric condition of eye in which, with accommodation at rest, incident parallel rays come to a focus anterior to the retina.[1] The person can see near objects more clearly than distant ones and are called “short-sighted”. The prevalence of simple myopia and high myopia (degenerative myopia) are increasing globally at an alarming rate, with significant increases in the risks for vision impairment from pathologic conditions associated with high myopia, including retinal damage, cataract and glaucoma. We conducted the study to find out the percentage of mild / moderate/severe myopia in adult patients at a rural tertiary care hospital.

Aims and Objectives: To study the clinical profile of Myopia in patients more than 20 years at a rural tertiary care hospital.

Materials and Methods: An Observational, Descriptive Cross-Sectional Hospital based study was conducted at a tertiary care hospital. A total of 100 patients with Myopia were screened and evaluated. We studied the myopic patients above 20 years attending to our hospital OPD. Family history and information about the risk factors was obtained by using pre structured proforma. Snellen’s chart was used to record the unaided visual acuity and best corrected visual acuity. Color vision was assessed by Ishihara pseudo isochromatic color plates. With the help of retinoscopy, refractive errors were determined. Spherical equivalent of refraction (SER) was calculated . Central corneal thickness was calculated by Pac Scan Pachymeter. Axial length was calculated by A Scan biometry. Dilated fundus examination was done by Direct and indirect ophthalmoscope. Results were analyzed using suitable statistical tests. Grading of myopia was done as Mild

ORIGINAL RESEARCH ARTICLE

<p>Corresponding author Dr. S. Nigwekar*</p>	<p>Myopia(<3D), Moderate Myopia (3-6 D), Severe Myopia (>6 D) and Pathological myopia with fundus changes.</p> <p>Results: The mean age of the study population was 32.98 ± 15.77 years with 53% (53) males and 47% (47) females. The mean SE was -2.66 ± 3.02 D. 66% (66) patients had mild myopia, 23% (23) patients had moderate myopia, 7% (7) patients had severe myopia while 4% (4) patients had pathological myopia with fundus changes.</p> <p>Conclusion: Occurrence of mild myopia is most common followed by moderate, severe, and pathological myopia which is the least common type.</p>
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INTRODUCTION:

Myopia, also known as short sight is a dioptric condition of eye in which, with accommodation at rest, incident parallel rays come to a focus anterior to the retina. [1] The person can see near objects more clearly than distant and are called “short sighted”. The majority of cases result as variants in the frequency curve of axial length and curvature, the former being more important. Such cases of simple myopia are not pathological as there are no degenerative changes in the fundus.

The prevalence of simple myopia and high myopia (degenerative myopia) are increasing globally at an alarming rate, with significant increases in the risks for vision impairment from pathologic conditions associated with high myopia, including retinal damage, cataract and glaucoma. The impact of myopia is difficult to determine, because there are no standard definitions of myopia and high myopia. A further impediment to progress in this area is insufficient evidence of the efficacy of various methods for controlling myopia. [2]

In 2000, the prevalence of myopia did not exceed 50% in any of the regions but, by 2050, the prevalence will be $\geq 50\%$ in 57% of the countries, if current trends continue. [3]

Countries in which the prevalence of myopia has been estimated and measured as low in the past (e.g. India) will have major increases by 2050.

In 2050, the prevalence of myopia will be much higher in high-income regions of the Asia Pacific, in east Asia and in south-east Asia, and the prevalence in high-income north America, southern Latin America, all of Europe, north Africa, the Middle East and about 30% of Africa will be similar to that in Asia today. The prevalence of high myopia is predicted to increase to 24% in all the Global Burden of Disease regions and in high-income Asia-Pacific countries by 2050.

According to Global Burden of Disease estimates, uncorrected distance refractive error is the second largest cause of blindness and the leading cause of moderate and severe vision impairment (53%)

Reducing the rate of myopia progression by 50% could reduce the prevalence of high myopia by up to 90% [3]

Thus, understanding its etiology, epidemiology, and the results of various treatment regimens may modify current care and result in a reduction in morbidity from progressive myopia. This rapid increase cannot be explained by genetics alone. The prevalence of myopia is higher in individuals whose both parents are myopic, suggesting that genetic factors are clearly involved in myopia development. [4] Current animal and human research demonstrates that myopia development is a result of the interplay between genetic and the environmental factors.

Myopia can be classified into different

types according to the degree of the refractive power as Mild Myopia (<3.00 D), Moderate myopia (-3.00D to -6.00 D), Severe myopia (>6.00 D) and Pathological myopia when it is associated with fundus changes.^[5]

The symptoms of myopia:^[6]

1. Decreased visual acuity
2. Muscae volitantes (Floaters)
3. Prolonged dark adaptation
4. Color vision defects
5. Night blindness
6. Visual field defects.

Signs of Myopia:

Anterior Segment changes in Myopia:

1. Increased AC depth
2. Increased axial length
3. Decreased corneal thickness
4. Increased corneal diameter

Posterior segment changes in myopia:

1. Vitreous Degeneration
2. Myopic crescent-temporal crescent.
3. Super traction crescent on the nasal side of disc
4. Tessellated (tigroid) appearance due to diffuse attenuation of RPE with the visibility of large choroidal vessels.
5. Focal chorioretinal atrophy
6. Lacquer cracks – rupture in RPE-chorio capillaries complex characterized by fine, irregular, yellow lines often branching and crisscrossing
7. Lattice degeneration
8. Sub retinal coin shaped hemorrhages
9. Foster-Fuchs spot – raised circular pigmented lesion at macula developing after a sub retinal hemorrhage has absorbed.
10. Posterior staphyloma
11. Macular hole
12. Rhegmatogenous retinal detachment
13. Choroidal neo vascularization
14. Foveal retinoschisis

RESULTS:

Table 1: Age and Gender wise distribution of Myopia

Age in years	Males	Females	Total (Percentage)
20-30 yrs.	28	31	59

AIM/OBJECTIVES:

To study the clinical profile of Myopia in adult patients at a rural tertiary care hospital.

MATERIALS AND METHODS:

In this Observational, Descriptive Cross Sectional Hospital based study conducted at a tertiary care hospital, we screened and evaluated total of 100 patients with Myopia from January 2021 to August 2022 after obtaining institutional ethical committee approval and written informed consent from all the patients.

All myopic patients above 20 years attending Ophthalmology OPD at a rural tertiary care hospital were included in the study. We excluded patients with other ocular pathology like glaucoma, cataract, uveitis and retinopathies like Diabetic Retinopathy, Hypertensive Retinopathy etc.

We studied the myopic patients above 20 years attending to our hospital OPD. Family history and information about the risk factors was obtained by using pre structured proforma. Snellen's chart was used to record the unaided visual acuity and best corrected visual acuity. Color vision was assessed by Ishihara pseudo isochromatic color plates with the help of retinoscopy, refractive errors were determined. Spherical Equivalent of Refraction (SER) was calculated for patients with compound myopia i.e. patients requiring with both spherical and cylindrical correction. We calculated SER by the formula: $SER = \frac{1}{2}(\text{Cylinder}) + \text{sphere}$.

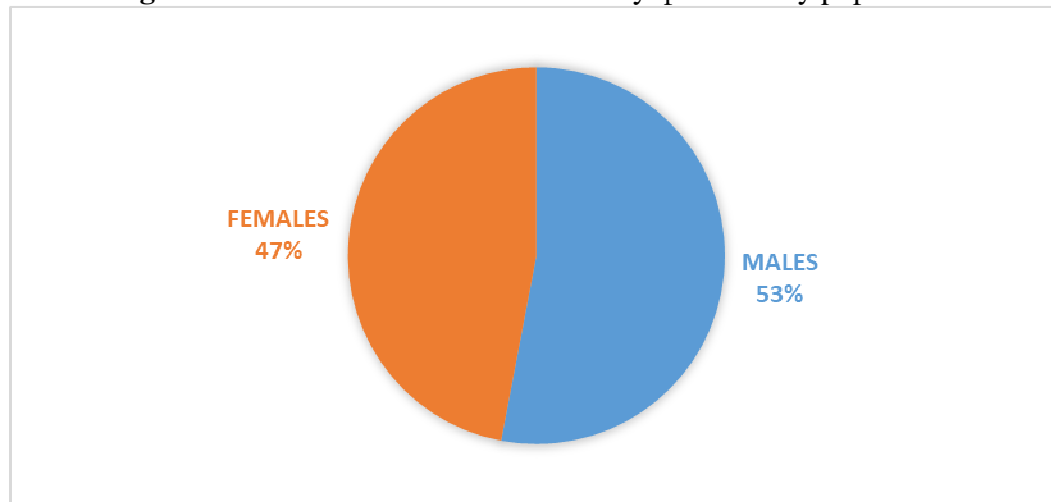
Central corneal thickness was calculated by Pac Scan Pachymeter. Axial length was calculated by A Scan biometry. Dilated fundus examination was done by Direct and indirect ophthalmoscope.

31-40 yrs.	9	5	14
41-50 yrs.	8	4	12
51-60 yrs.	5	1	6
>60 yrs.	3	6	9
Total	53(53%)	47(47%)	100(100%)
Mean \pm SD	33.28 \pm 14.99	31.39 \pm 15.77	32.98 \pm 15.77

The mean age of the study population was 32.98 \pm 15.77 years. Most common age group

was 20 -30 years which had 59% of the study population.

Figure 1: Gender wise distribution of Myopia in study population



Total study cases were 100, 53% of the total study population were males and 47% of the total study population were females. The female to male ratio was 1:1.12.

Table2: number of patients in various types of myopia

Mild myopia (n=66)		Moderate Myopia (n=23)		Severe Myopia (n=7)		Pathological Myopia (n=4)	
Male	Female	Male	Female	Male	Female	Male	Female
33	33	12	11	6	1	2	2

Out of the 100 patients in the study population, 66% (66) patients had mild myopia of which 33 patients were male, 23% (23) patients had moderate myopia of which 12 patients were male, 7% (7) patients had severe myopia of which 6 patients were male and 4% (4) had pathological myopia of which 2 patients were male.

Out of the 4 patients having pathological myopia 1 patient each had myopic retinal degeneration with posterior staphyloma, laquer cracks, and two patients had temporal myopic crescent.

Female preponderance was seen in moderate myopia and severe myopia. Equal occurrence between males and females was seen in mild myopia and pathological myopia.

Table 3: Mean SE in various types of myopia

Type of myopia	Spherical equivalence (se)
Mild Myopia	-1.41 ± 0.94D
Moderate Myopia	-4.37 ± 0.81D.
Severe Myopia	-7.32 ± 0.56D
Pathological Myopia	-12.62 ± 6.22D
Total	-2.96 ± 3.14 D

The mean SE in the study population was -2.96 ± 3.14 D. The mean SE in mild myopia is -1.41 ± 0.94D. The mean SE in moderate

myopia is -4.37 ± 0.81D. The mean SE in severe myopia is -7.32 ± 0.56D. The mean SE in pathological myopia is -12.62 ± 6.22D.

Table 4: Age distribution in various types of myopia

Type of myopia	Mean age (years)	Most common age group
Mild Myopia	33.87 ± 15.82	20-30 yrs.
Moderate Myopia	30.04 ± 15.84	20-30 yrs.
Severe Myopia	38 ± 16.18	20-30 yrs.
Pathological myopia	24 ± 3.53	20-30 yrs.

The mean age in patients with mild myopia was 33.87 ± 15.82 years. The mean age in patients with moderate myopia was 30.04 ± 15.84 years. The mean age in patients with severe myopia was 38 ± 16.18 years. The

mean age in patients with pathological myopia was 24 ± 3.53 years. 20-30 yrs. was the most common age group found in all types of myopia.

Table 5: Symptoms seen in study population

Symptoms	Number of patients (%)
Diminution of vision	79 (n=79)
Floater	16 (n=16)
Visual field defects	5 (n=5)
Color vision defects	0 (n=0)
Night blindness	0 (n=0)

The most common symptom in the study population was diminution of vision which was seen in 79% (79) patients, followed by floaters which was seen in 16%(16)

patients while 5%(5) patients showed visual field defects. Night blindness or color vision defects were not seen in any of the patients.

Table 6: Mean axial length and Mean CCT in various types of Myopia

	Mild myopia	Moderate myopia	Severe myopia	Pathological myopia	Total
AXIAL LENGTH (mm)	23.76 ± 0.53	24.17 ± 0.84	24.55 ± 1.03	28.35 ± 3.71	24.11 ± 1.37
CCT (mm)	0.540± 0.029	0.530 ± 0.029	0.541± 0.019	0.555 ± 0.030	0.538 ± 0.029

The mean axial length in the study population was 24.11 ± 1.37 mm. The mean axial length in patients with mild myopia was 23.76 ± 0.53 mm. The mean axial length in patients with moderate myopia was 24.17 ± 0.84 mm. The mean axial length in patients with severe myopia was 24.55 ± 1.03 mm. The mean axial length in patients with pathological myopia was 28.35 ± 3.71 mm.

The mean CCT in the study population was 0.538 ± 0.029 mm. The mean CCT in patients with mild myopia was 0.540 ± 0.029 mm. The mean CCT in patients with moderate myopia was 0.530 ± 0.029 mm. The mean CCT in patients with severe myopia was 0.541 ± 0.019 mm. The mean CCT in patients with pathological myopia was 0.555 ± 0.030 mm.

Table 7: Mean Corneal curvature in various types of myopia

	Mild myopia	Moderate myopia	Severe myopia	Pathological myopia	Total
Corneal Curvature	43.81 ± 3.28	43.98 ± 1.40	45.17 ± 1.75	45.56 ± 0.89	44.04 ± 2.85

The mean corneal curvature in the study population was 44.04 ± 2.85 D. The mean corneal curvature in patients with mild myopia was 43.81 ± 3.28 D. The mean corneal curvature in patients with moderate myopia was 43.98 ± 1.40 D. The mean corneal curvature in patients with severe myopia was 45.17 ± 1.75 D. The mean corneal curvature in patients with pathological myopia was 45.56 ± 0.89 D.

DISCUSSION:

In this hospital based observational, descriptive cross sectional study, 100 patients with myopia were evaluated. There was male predominance in this study with F:M ratio of 1:1.12. Similar results were found in a study by Rishi Mehta et al. which showed F:M ratio of 1:1.19.^[7]

Mild myopia was found to be the most common type of myopia followed by Moderate Myopia, Severe Myopia and Pathological Myopia. Similar results were found in a study by Rishi Mehta et.al.^[7] which showed mild myopia in 61.78% patients, moderate Myopia in 26.82% patients and severe myopia in 11.38% patients.

The mean axial length in the study population was 24.11 ± 1.37 mm. A continuous increase in axial length was seen with increase in severity of myopia. Similar

results were found in a study by Qian Fan et al.^[8]

The mean Central Corneal Thickness was found to be 0.538 ± 0.029 mm. No correlation was found between Central Corneal thickness and the degree of myopia. Similar results were found in a studies by K Divya et al.^[9] which showed mean CCT to be 0.540 ± 0.056 mm, Solu et al.^[10] which showed mean CCT to be 0.547 ± 0.028 mm and Fam et al.^[11] which showed mean CCT to be 0.534 ± 0.038 mm. No correlation between CCT and degree of myopia was seen in all these studies

In our study 68% (68) had a positive family history and/or were performing near work reading as a part of their lifestyle. These were the patients who were medical students or were exposed to longer screen time. Due to the occupation these patients were more of indoor activities and less time of outdoor activity. So it was concluded that greater time spent on near work, less time spent outdoors, are most common risk factors for the development of Myopia. Similar results were found in a study by Rishi Mehta et al.^[7]

CONCLUSION:

Occurrence of mild myopia is most common followed by moderate, severe and pathological myopia which is the least

common type.

LIMITATIONS: Small sample size.

CONFLICT OF INTEREST: NIL

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