

Peripheral Retinal Changes in Myopic Fundus

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Abstract: Aim: To analyse the incidence of degenerative lesions occurring in the peripheral retina of myopic eyes and to correlate these changes with the age of the patient, axial length of the eye ball and the degree of myopia. Study: A hospital based cross sectional observational study. Methods: Detailed history was taken and subjected to intensive examination of anterior and posterior segment of the eye. Axial lengths were recorded using A scan. Fundus changes in different degrees of myopia were noted and analyzed. Results: In the present study males were affected more with varying axial lengths. Peripheral retinal degenerations are more common in moderate to higher degrees of myopia. In the present study incidence of myopic crescent was high. Conclusion: In the present study degenerative changes in fundus are evident even in lesser degrees of myopia. Hence thorough examination of peripheral fundus using indirect ophthalmoscope for all cases of myopia will help in early diagnosis and treatment.

1. Introduction

Myopia is one of the common optical aberrations of eye. Myopia is associated with several retinal degenerations that can cause irreversible blindness. Peripheral retina is prone for various degeneration secondary to its anatomical dehiscence like thinness, presence of poorly developed retinal cells and absence of large blood vessels.

The discovery of binocular indirect ophthalmoscope, has been of immense help in the examination of retina of the myopic subjects who are frequently affected by dangerous pathological lesions in the periphery.

Aim

This study was undertaken to analyse the incidence of degenerative lesions occurring in the peripheral retina of myopic eyes and to correlate these changes with the age of the patient, axial length of the eye ball and the degree of myopia.

Methodology

This is a hospital based cross sectional observational study that was conducted in the patients attending the outpatient department of government regional eye hospital Visakhapatnam from January 2017 to June 2017 in a sample size of 200 eyes i.e. of 100 patients with myopia.

Inclusion Criteria:

- Age above 10 years who were diagnosed as myopes
- Patients with normal Corneal curvature.

Exclusion Criteria:

- Patients of age less than ten years.
- Patients with index myopia.
- Patients with abnormal corneal curvature (Curvature Myopia).
- Patients giving h/o trauma, diabetes, hypertensive and undergone RD surgeries.
- Patients having media opacities that prevented indirect ophthalmoscopic examination.

2. Methods

All cases were subjected to detailed history such as age of onset, progression, duration of use of refractive correction and other complaints. Any similar condition prevalent amongst parents and siblings of the patients were enquired.

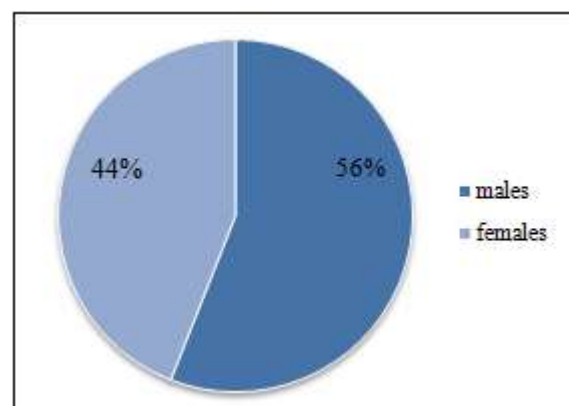
For the ocular examination: Best corrected visual acuity was noted.

Cycloplegic refraction was determined and subjective correction was given the next day. Axial lengths were measured using A-scan. Keratometry readings were taken. Fundus examination was done with indirect ophthalmoscopy (sclera indentation). The results obtained were then statistically analysed.

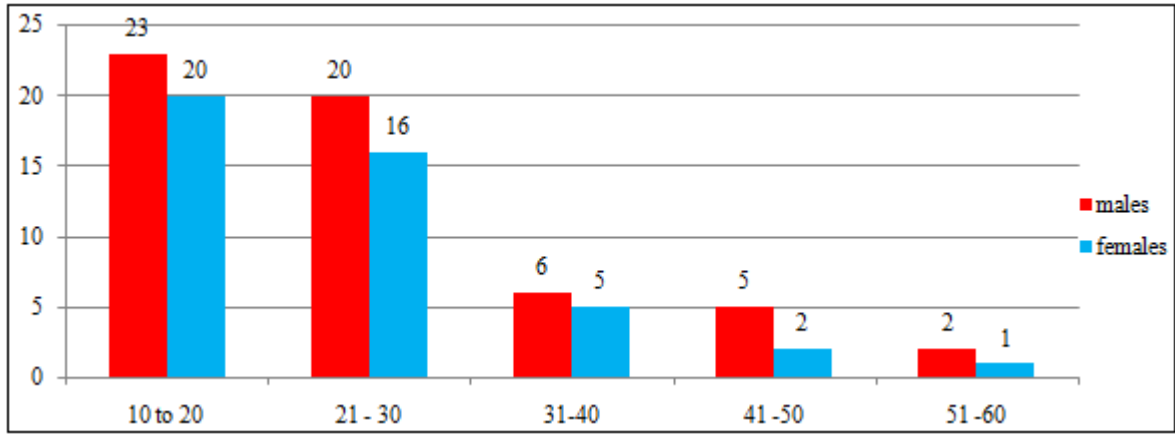
3. Results

Age and Sex Distribution

age	males	Percent of males	females	Percent of females	total
10-20	23	41.07%	20	45.45%	43
21-30	20	35.71%	16	36.36%	36
31-40	6	10.71%	5	11.36%	11
41-50	5	8.92%	2	4.50%	7
51-60	2	3.50%	1	2.20%	3
total	56	56%	44	44%	100



Sex Distribution



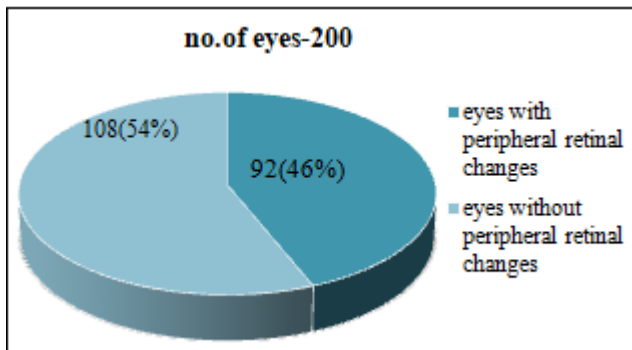
Correlation of degree of myopia with degenerative changes

Degree of myopia	No. of eyes	no. of eyes with peripheral retinal changes	No. of eyes without peripheral retinal changes
<-3.00 D	60(30%)	10(16.66%)	50(83.33%)
-3.0 TO -6.0 D	72(36%)	30(41.66%)	42(58.33%)
-6.0 TO -9.0 D	40(20%)	29(72.5%)	11(27.5%)
-9.0 TO -12.0 D	12(6%)	9(75%)	3(25%)
-12.0 TO -15.0 D	10(5%)	9(90%)	1(10%)
-15.0 TO -18.0 D	4(2%)	3(75%)	1(25%)
-18.0 TO -21.0 D	2(1%)	2(100%)	0
total	200	92(46%)	108(54%)

Age	No.of eyes	Paving stone degeneration	Snail track degeneration	WWP/WWOP	Retinal tears
10-20	86	-	2	4	2
21-30	72	1	1	5	3
31-40	22	1	1	1	2
41-50	14	2	-	-	2
50-60	6	-	-	-	-
total	200	4	4	10	9

Age with peripheral retinal changes

Age	No.of eyes	Lattice degeneration	Pigmentary changes	Retinal holes
10-20	86	10	5	2
21-30	72	20	7	4
31-40	22	4	4	2
41-50	14	1	2	1
51-60	6	1	1	-
total	200	36(18%)	19(9.5%)	9(4.5%)



Correlation of axial length with peripheral retinal changes

Axial length	No.of eyes	Lattice	Pigmentary	Retinal tears	Retinal holes	Paving stone	Snail track	WWP/WWOP
<23.5	20	-	-	-	-	-	-	-
23.5-24.4	25	-	-	-	-	-	-	2
24.5-25.4	20	-	2	-	-	-	-	4(20%)
25.5-26.4	30	10	3	3	3	-	1	3
26.5-27.4	40	16(40%)	5	2	4(10%)	2	2(10%)	1
27.5-28.4	30	4	2	2	1	2(6.6%)	1	-
28.5-29.4	18	5	2	-	1	-	-	-
29.5-30.4	9	1	2	1	-	-	-	-
30.5-31.4	3	-	1	-	-	-	-	-
31.5-32.4	3	-	1	-	-	-	-	-
32.5-33.4	2	-	1(50%)	1(50%)	-	-	-	-

Supero temporal	28(77.77%)
Infero temporal	3(8.3%)
Superonasal	4(11.11%)
Inferonasal	1(2.71%)
Total	36

4. Types of Lattice Degeneration

In the present study 200 eyes of 100 cases with axial myopia were examined. Among 100 patients 56 were males(56%) and females were 44(44%) distributed in the age groups 10-60 years.

Majority of cases were observed in the 10-20 years age group .(M-53.48%, F- 46.51%).Least incidence was observed in the 50-60 years age group.

The degree of myopia in this study ranged from -1.0D to -21.0D. In the present study as the degree of myopia increases the % of eyes with peripheral retinal changes also increased.

Axial lengths are varied from 22.34mm to 33.2mm. Majority of eyes are having axial length in the range of 26.5 to 27.4(40 eyes-20%) whereas least number of eyes (2eyes-1%) are seen with axial length of 32.5 to 33.4mm.

Out of 200 eyes examined peripheral retinal changes were present in 92 eyes(46%).Among the peripheral retinal changes **lattice degeneration was the predominant finding(18%)** followed by pigmentary changes (9.5%),WWP/WWOP(5%), retinal tears(4.5%),retinal holes(4.5%),paving stone degeneration and snail track degeneration (2%) are seen.

Majority of the lattice degenerations are found in the axial length range of 26.5-27.4mm. Among 36 eyes with lattice degeneration 28 were seen in superotemporal quadrant.WWP/WWOP were mostly present in younger age group.

5. Discussion

A Cross – sectional study by Foster et al reported peripheral retinal changes in 61.7% highly myopic eyes. The most common pathology observed included white without pressure (51.7%), lattice degeneration (5.8%), microcystoid degeneration (5%) and pigmentary degeneration (4.2%)

The most common common finding was predominantly lattice degeneration(18%) followed by pigmentary changes (9.5%), WWP/WWOP (5%), retinal tears and retinal holes(4.5% each),paving stone degeneration and snail track degeneration accounting for 2% each.

	I.S.Jain etal	Manoj shukla etal	Lam etal	O Malley PF etal	Present study
High myopia	16%				34%
WWP/WWOP		27.60%			5%
Lattice			12.20%		18%
Paving stone degeneration				22%	2%

In a study done to evaluate the prevalence and factors associated with posterior pole and peripheral retinal lesions in Chinese subjects with high myopia, eyes with axial length of >29 mm more likely to have peripheral retinal lesion.In the present study peripheral retinal changes were present in eyes with axial length >26.5mm than eyes with axial length <26.5mm.

6. Conclusion

In our analysis of 100 myopic patients, 46% showed various peripheral retinal changes in fundus. Younger age group is most commonly affected. The peripheral degenerative changes though common in moderate to higher degrees of myopia, it was present in lesser degrees also. As the axial length of the eye increases, the degenerative changes also increased.

So all the cases of myopia must be examined meticulously with indirect ophthalmoscope which can pick up complications at the earliest and can be treated effectively for better visual outcomes.

Awareness need to be created among myopic population regarding visual hygiene, safety precautions, risks and complication involved. The periodical monitoring and properly structured patient education program will help them to be aware of the symptoms and warning signs. It helps in early recognition of symptoms to intervene immediately for better visual prognosis.

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