Original Research Paper

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Ophthalmology

EVALUATION OF MACULAR MORPHOLOGICAL CHANGES IN RETINITIS PIGMENTOSA BY OPTICAL COHERENCE TOMOGRAPHY

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KEYWORDS :

INTRODUCTION

DEFINITION:

Clinically and genetically heterogeneous group of inherited retinal disorders characterized by diffuse progressive dysfunction of predominantly rod photoreceptors, with subsequent degeneration of cone photoreceptors, and retinal pigment epithelium (RPE).

- RP is a major cause of acquired blindness in adults worldwide, occurring in 1 out of every 4,000 individuals.
- The clinical diagnosis of RP is based on the presence of nyctalopia, visual field constriction, bone spicule pigmentation, and a reduction in electroretinogram response (ERG).
- With the advancement of the disease, the cone photoreceptors become involved, leading to severe vision loss at the end stage of RP.
- Previous studies of RP verified that the earliest histopathological changes were the shortening of the photoreceptor outer segments .
- These changes begin in the periphery and progress toward the central retina; therefore, morphological and functional assessments of the retinal changes can be useful in estimating the disease advancement and the remaining retinal function of RP patients.
- With the introduction of spectral domain (SD)-OCT, it has been possible to obtain structural information on retinal anatomical abnormalities in patients with RP

AIM OF THE STUDY:

- The objective of the current study is to evaluate the macular morphological changes in Retinitis pigmentosa by Optical Coherence Tomography and to assess their correlation with visual acuityuctural information on retinal anatomical abnormalities in patients with RP

MATERIALS AND METHODS

- **Study design:** A hospital based cross sectional observational study.
- **Study period:** january 2018 to June 2018
- **Study set up:** study conducted in the patients attending the outpatient department and retina clinic of Government Regional Eye Hospital ,Visakhapatnam.
- **Sample size:** 120 eyes of 60 patients.

INCLUSION CRITERIA

- Clinically diagnosed cases of retinitis pigmentosa

EXCLUSION CRITERIA

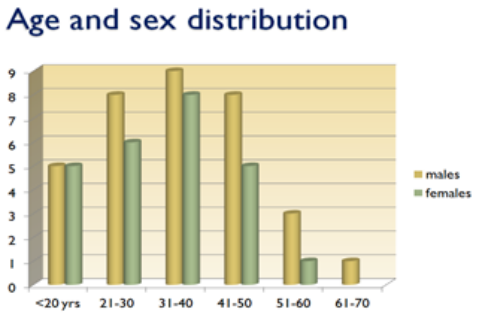
- Individuals with significant media opacities and other intraocular diseases were excluded from the current study.
- Patients with diabetes mellitus, ocular inflammatory diseases, primary retinal vascular diseases, previous ocular trauma, or previous intraocular surgery were excluded.
- Age <18 yrs old
- Any optic neuropathy, including glaucoma, or any condition increasing the risk of secondary glaucoma (e.g., pigment dispersion syndrome or pseudoexfoliation syndrome

• RESULTS

Age and sex distribution

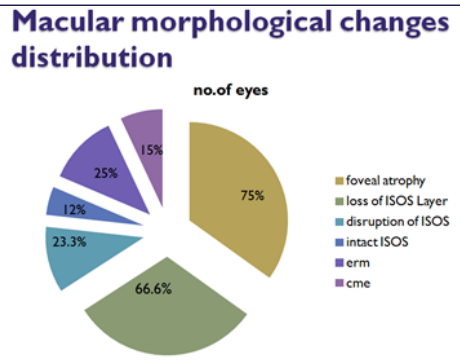
Age and sex distribution

Age	Males	Females	Total
<=20 yrs	5	5	10
21-30 yrs	8(57.14%)	6(42.8%)	14(23.3%)
31-40 yrs	9(52.9%)	8(47.05%)	17(28.3%)
41-50 yrs	8	5	13(21.6%)
51-60 yrs	3	1	4
61-70 yrs	1	1	2
	34(56%)	26(43.3%)	60



Morphological changes	No.of eyes
FOVEAL THINNING	90(75%)
LOSS OF IS/OS LAYER	80(66.6%)
DISRUPTION OF ISOS LAYER	28(23.3%)
INTACT ISOS LAYER	12(10%)
EPIRETINAL MEMBRANE	30(25%)
CYSTOID MACULAR EDEMA	18(15%)

Data	>6/18	<6/18-6/60	<6/60	Total	P-value
No.of eyes	20	65	35	120	
Mean CMT	210.24±9.34	184±10.2	160.43±12.2	182±21.2	0.002
Foveal thinning	3	53	34	90	
Loss of IS/OS junction	-	48	32	80	0.001
Disruption of IS/OS junction	3	22	3	28	
Intact IS/OS junction	12	-	-	12	
ERM	10	12	8	30	0.3
CME	5	7	6	18	0.2



RESULTS:

- In the present study 120 eyes of 60 patients with retnitis pigmentosa were examined.
- Among 60 patients 34 were males(54%) and females were 26(43.3%) distributed in the age groups 18-65 years.
- Majority of the cases were observed in the age group of 31-40 years(males-52.9%,females-47%)
- Mean age of participants at the time of evaluation is 33.7±10.2 years.
- Mean central macular thickness was 182±21.2 µm.
- Mean Best Corrected Visual Acuity(BCVA)-0.82±0.45 log MAR units.

In the present study:

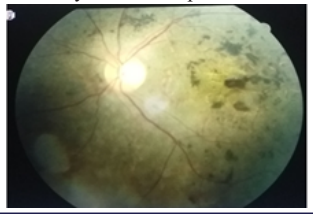
- foveal atrophy was seen in 90 eyes(75%),
- loss of ISOS layer was seen in 80 eyes(66.6%),
- disruption of ISOS layer was seen in 28 eyes(23.3%),
- intact ISOS layer was seen in 12 eyes (10%),
- epiretinal membrane was seen in 30 eyes(25%),
- cystoid macular edema was seen in 18 eyes(15%)
- Statistically significant correlation was seen between BCVA and CMT (Pearson's correlation coefficient=0.784; *P*=0.002).
- Statistically significant association was seen BCVA and loss of IS/OS layer(P-0.001)
- Epiretinal membrane and cystoid macular edema did not show any statistical association with BCVA.(P-0.3, P-0.2 respectively)

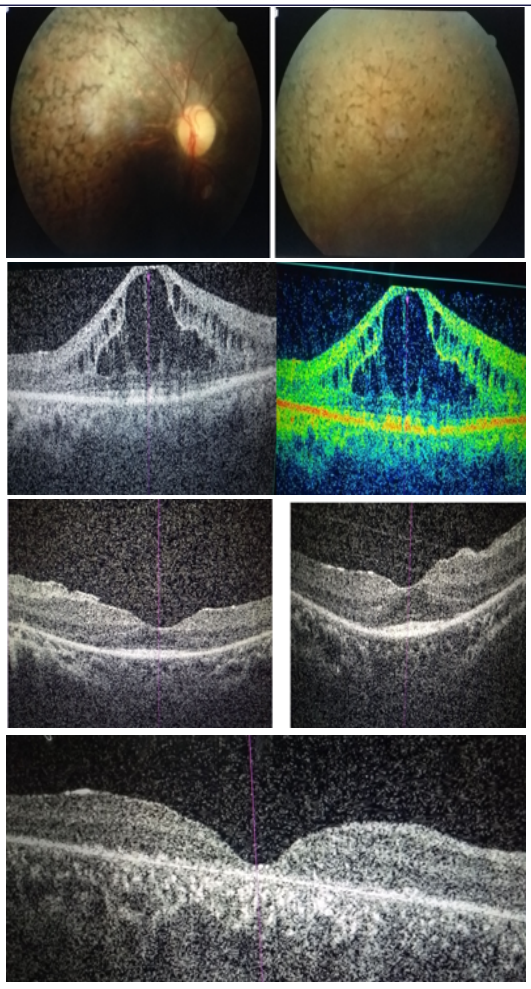
DISCUSSION

- In the present study, there was a statistically significant correlation between CMT and BCVA
- Witkin *et al.*(14) reported that the central foveal thickness and foveal outer segments lengths were significantly associated with the visual acuity.

	ERM	CME	CNVM
Present study	**25%**	**15%**	**-**
Sandberg et al	-	15%	-
Triolo et al	27.3%	12.5%	1.7%
Hajali et al	-	39%	-
	Loss of ISOS Layer	**Disruption of ISOS Layer**	**Intact ISOS layer**
Present study	**66.6%**	**23.3%**	**10%**
Sandberg et al	29.5%	56.6%	13.9%

- In the present study Foveal thinning and abnormalities in the IS/OS seems to jeopardize the visual acuity in the patients of retinitis pigmentosa than other macular abnormalities.
- Kim et al. concluded that the IS-OS disruption correlates with a worse visual acuity.
- Aizawa et al. concluded that the absence of an IS-OS junction line may reflect a foveal dysfunction in patients with RP.





CONCLUSION

- OCT has been confirmed to be an ideal method for evaluating the treatable morphological changes of macula in RP.
- A significant correlation between the visual acuity and presence of the IS/OS layer indicates that the integrity of IS/OS line may be an important parameter to monitor RP patients.
- Foveal thinning and IS-OS junction disruption carry the most guarded prognosis.

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