Section: Ophthalmology

Original Research Article

RETINAL MANIFESTATIONS IN PATIENTS WITH HEMATOLOGICAL DISORDERS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Purpose: To evaluate retinal manifestations in patients with various hematological disorders. **Materials and Methods:** A hospital-based cross-sectional study including 50 patients (25 malignant and 25 non-malignant). All patients underwent complete ophthalmic examination and hematological evaluation. Data were analyzed using descriptive statistics with frequency and percentage distribution.
Results: Cotton wool spots (38%), retinal hemorrhages (35%), and pre-retinal hemorrhages (17%) were the most common ocular findings. Malignant disorders showed higher incidence of retinal hemorrhages (36%) compared to non-malignant group (34%).
Conclusion: Retinal manifestations are frequent in hematological disorders. Routine ophthalmic screening is recommended for early detection and timely intervention.
Keywords: Hematological disorders, Leukemia, Anemia, Retinal hemorrhage, Cotton wool spots.

INTRODUCTION

Hematological disorders encompass a wide spectrum of benign and malignant diseases that frequently present with ocular manifestations. The retina provides a unique opportunity to directly visualize vascular and hematological changes. Early identification of retinal signs may aid in diagnosis and prognosis.
Aim: The aim of the study was to analyse the retinal manifestations in patients with various hematological disorders.

MATERIALS AND METHODS

This is a Cross-sectional study of 50 patients diagnosed with hematological disorder, who presented to Regional Institute of Ophthalmology, Chennai. Duration of the study was for 1 year. Patients were taken up for the study after obtaining informed consent. All age groups with confirmed hematological disorders were included in the study. Patients with uncontrolled diabetes, hypertension, HIV, history of any other ocular diseases (Eale's disease, CRAO, CRVO) and ocular trauma were excluded. After obtaining detailed history, the patients were subjected to comprehensive ocular examination which included measurement of visual acuity, intra ocular pressure, slit lamp examination and detailed fundus examination with +90 D and indirect ophthalmoscopy. Data was analyzed using descriptive statistics (mean, SD, frequency, percentage).

RESULTS

41 to 50 yrs were the common age group in both non-malignant and malignant group. Majority of the patient presented with good visual acuity (6/6 to 6/9). Males were found to be commonly affected in non-malignant group. Females were found to be commonly affected in malignant group. Iron deficiency anemia commonly associated systemic disease in non-malignant group. Acute lymphocytic leukemia and chronic myelocytic leukemia was commonly associated systemic disease in malignant group. Common ocular manifestation in non-malignant group was cotton wool spot and vitreous

hemorrhage least common feature. Retinal hemorrhage was the common ocular feature in malignant group and least common was vascular occlusion and vitreous hemorrhage.

50 patients were included in our study, out of which 25 were nonmalignant and 25 were malignant.

Diagnosis		
	Frequency	Percent
Malignant	25	50.0
Non-malignant	25	50.0
Total	50	100.0

AGE INCIDENCE:

Age distribution		
	Frequency	**Percent**
21 - 30 years	5	20.0
31 - 40 years	10	40.0
41 - 50 years	10	40.0
Total	25	100.0

Age group of 31-40;41-50 years (40%) present in non-malignant group.

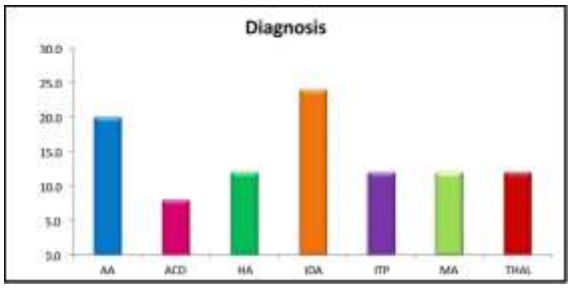
SEX DISTRIBUTION:

Gender distribution		
	Frequency	**Percent**
Female	8	32.0
Male	17	68.0
Total	25	100.0

Among the 25 non-malignant patients 17 were males (68%) and 8 were females (32%).

NON-MALIGNANT DISEASE:

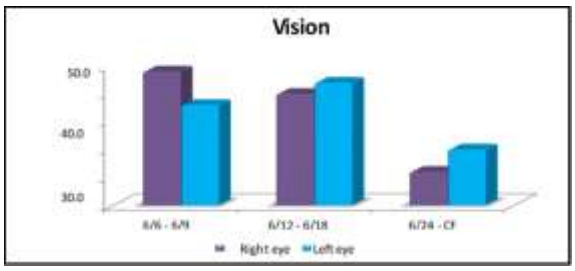
Diagnosis		
	Frequency	**Percent**
Aplastic Anaemia	5	20.0
Anaemia of Chronic diseases	2	8.0
Haemolytic Anaemia	3	12.0
Iron Deficiency Anaemia	6	24.0
Idiopathic Thrombocytopenia	3	12.0
Megaloblastic Anaemia	3	12.0
Thalassemia	3	12.0
Total	25	100.0



Iron deficiency anemia (24%) was the common followed by aplastic anemia(20%) in non-malignant group.

VISUAL ACUITY AT PRESENTATION:

Vn					Total	
	Right Eye		Left Eye			
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
6/6 - 6/9	12	48.0	9	36.0	21	42
6/12 - 6/18	10	40.0	11	44.0	21	42
6/24 - CF	3	12.0	5	20.0	8	16
Total	25	100.0	25	100.0	50	100



Out of 25 patients 42% of the patient present with good visual acuity (6/6 to 6/9); 42% of the patient present with reasonably good visual acuity (6/12 to 6/18) and 16% of the patient present with visual acuity less than 6/24 to CF.

INCIDENCE OF OCULAR MANIFESTATIONS:

PRE RETINAL HEMORRHAGE

		Eyes				Total	
		Right		Left			
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Pre retinal	Absent	19	76.0%	19	76.0%	38	76.0%
	Present	6	24.0%	6	24.0%	12	24.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patient 24% of the patient present with pre retinal hemorrrhage.

RETINAL HEMORHAGE

		Eyes				Total	
		Right		Left			
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Retinal hemorrhage	Absent	18	72.0%	15	60.0%	33	66.0%
	Present	7	28.0%	10	40.0%	17	34.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patient 34% of the patient present with retinal hemorrhage.

VITREOUS HEMORRHAGE

		Eyes				Total	
		Right		Left			
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Vitreous hemorrhage	Absent	25	100.0%	22	88.0%	47	94.0%
	Present	0	0.0%	3	12.0%	3	6.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patient 6% patient present with vitreous hemorrhage.

ROTH SPOTS

		Eyes				Total	
		Right		Left			
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Roth spot	Absent	23	92.0%	21	84.0%	44	88.0%
	Present	2	8.0%	4	16.0%	6	12.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patient 12% of the patient present with roth spot.

COTTON WOOL SPOTS

		Eyes				Total	
		Right		Left			
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Cotton wool spot	Absent	16	64.0%	13	52.0%	29	58.0%
	Present	9	36.0%	12	48.0%	21	42.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patient 42% present with cotton wool spot.

PAPILLEDEMA:

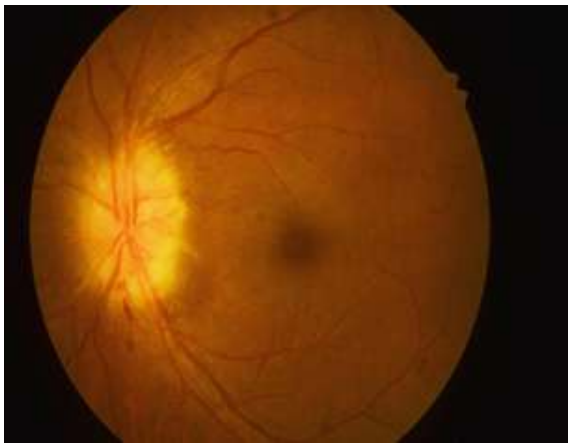
		Eyes				Total	
		Right		Left			
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Papilledema	Absent	23	92.0%	20	80.0%	43	86.0%
	Present	2	8.0%	5	20.0%	7	14.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patients 14% present with papilledema.

VASCULAR OCCLUSION:

		Eyes				Total	
		Right		Left			
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Vascular occlusion	Absent	23	92.0%	23	92.0%	46	92.0%
	Present	2	8.0%	2	8.0%	4	8.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patients 8% present with vascular occlusion.



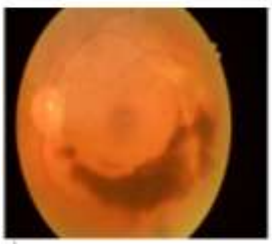
VASCULAR TORTUOSITY

		Eyes				Total	
		Right		Left			
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Vascular tortuosity	Absent	24	96.0%	22	88.0%	46	92.0%
	Present	1	4.0%	3	12.0%	4	8.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patients 8% of the patient present with vascular tortuosity.

VASCULAR OCCLUSION

PRE RETINAL HEMORRHAGE:



ROTH SPOT

COTTON WOOL SPOTS: MALIGNANT DISEASE

Age distribution		
	Frequency	Percent
21 - 30 years	3	12.0
31 - 40 years	4	16.0
41 - 50 years	18	72.0
Total	25	100.0

41-50 yrs age group 72%) common in malignant group.

SEX DISTRIBUTION:

Gender distribution		
	Frequency	**Percent**
Female	13	52.0
Male	12	48.0
Total	25	100.0

Malignant group presented with age distribution of females 52% and males 48%.

MALIGNANT DISEASE

Diagnosis		
	Frequency	**Percent**
ALL	5	20.0
AML	4	16.0
CLL	3	12.0
CML	5	20.0
HL	4	16.0
NHL	4	16.0
Total	25	100.0

ALL (20%) and CML (20%) present in malignant group.

VISUAL ACUITY AT PRESENTATION

Vision					Total	
	Right Eye		Left Eye			
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
6/6 - 6/9	13	52.0	13	52.0	26	52
6/12 - 6/18	7	28.0	8	32.0	15	30
6/24 - CF	5	20.0	4	16.0	9	18
Total	25	100.0	25	100.0	50	100

Out of 25 patient 52% present with good visual acuity (6/6 to 6/9), 30% with reasonably good visual acuity (6/12 to 6/18) and 18% with visual acuity less than 6/24 to CF.

PRE RETINAL HEMORRHAGE

		Eyes				Total	
		Right		Left			
		Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Pre retinal	Absent	21	84.0%	24	96.0%	45	90.0%
	Present	4	16.0%	1	4.0%	5	10.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patient 10% of the patient present with pre retinal hemorrhage.

RETINAL HEMORRHAGE

		Eyes				Total	
		Right		Left			
		Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Retinal hemorrhage	Absent	19	76.0%	13	52.0%	32	64.0%
	Present	6	24.0%	12	48.0%	18	36.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patient 36% of the patient present with retinal haemorrhage.

VITREOUS HEMORRHAGE

		Eyes				Total	
		Right		Left			
		Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Vitreous hemorrhage	Absent	23	92.0%	24	96.0%	47	94.0%
	Present	2	8.0%	1	4.0%	3	6.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patient 6% of the patient present with vitreous hemorrhage.

ROTH SPOT

		Eyes				Total	
		Right		Left			
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Roth spot	Absent	20	80.0%	19	76.0%	39	78.0%
	Present	5	20.0%	6	24.0%	11	22.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patient 22% of the patient present with roth spot.

COTTON WOOL SPOT

		Eyes				Total	
		Right		Left			
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Cotton wool spot	Absent	16	64.0%	17	68.0%	33	66.0%
	Present	9	36.0%	8	32.0%	17	34.0%
Total		25	100.0%	25	100.0%	50	100.0%

Out of 25 patient 34% of the patient present with cotton wool spot.

PAPILLEDEMA

		Eyes				Total	
		Right		Left			
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Papilledema	Absent	24	96.0%	22	88.0%	46	92.0%
	Present	1	4.0%	3	12.0%	4	8.0%
Total		25	100.0%	25	100.0%	50	100.0%

Table 1: Distribution of Study Population

Diagnosis	Frequency	Percentage
Non-malignant	25	50%
Malignant	25	50%

Table 2: Ocular Manifestations in Non-Malignant Group

Manifestation	Frequency	Percentage
Cotton wool spots	21	42%
Retinal hemorrhage	17	34%
Pre-retinal hemorrhage	12	24%
Papilledema	7	14%
Roth spots	6	12%
Vitreous hemorrhage	3	6%

Table 3: Ocular Manifestations in Malignant Group

Manifestation	Frequency	Percentage
Retinal hemorrhage	18	36%
Cotton wool spots	17	34%
Roth spots	11	22%
Pre-retinal hemorrhage	5	10%
Papilledema	4	8%
Vitreous hemorrhage	3	6%

DISCUSSION

Out of 50 patients: 50% of the patient presented in non-malignant and remaining 50% presented in malignant group. Iron deficiency anemia (24%) was the most common systemic association in non-malignant group followed by aplastic anemia (20%), concurrent with study done by Quadri et al. In malignant group acute lymphocytic leukemia (20%) and chronic myelocytic leukemia (20%) was the most common systemic association similar to study done by schachat et al.

Age group of 41 to 50 yrs commonly affected in non-malignant (40%) and in malignant group (72%). Non-malignant group presented with male predominance (68%);malignant group of the blood presented with female predominance (52%) 42% of the patient presented with good visual acuity in non-malignant group and in malignant group presented with 52% of good visual acuity (6/6 to 6/9). 16% of the patient presented with visual acuity less than 6/24 to CF in non-malignant group and 18 % in malignant group.

Cotton wool spots (42%) was the common ocular manifestation in non-malignant group; in malignant group the most common ocular feature was retinal haemorrhage (36%) similar to the study result showed by Holt J.M & Gordensmith, Rubenstein and Yanoff, Merin S. Least common ocular manifestation in non-malignant group was vitreous haemorrhage (6%); in malignant group vitreous hemorrhage

(6%)and vascular occlusion(6%) was least common feature.

CONCLUSION

Retinal manifestations are frequently observed in hematological disorder, making ophthalmological examination mandatory. Since the ocular fundus gives an unparalleled direct view of the hematological disorder thereby the ophthalmologist by observing the characteristic changes in retina, may be the first member of the medical team to identify the hematological disorder. Characteristic findings are identified on ophthalmoscopy that may give a clue to underlying systemic disease, thereby allowing for early referral for treatment by the physician. As hematological disorder can present with varied retinal manifestation. So that early referral and timely intervention not only prevent further visual loss but also help to preserve whatever useful vision patient has. Timely intervention also helps in better survival

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