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Posterior Segment Ocular Manifestations in Patients with Hematological Disorders

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Abstract: ***Introduction: In the field of ophthalmology, the intersection between hematological disorders and retinal manifestations presents a complex and intriguing area of study. The retina can exhibit various signs and symptoms reflective of underlying hematological abnormalities. Understanding these retinal manifestations not only aids in early diagnosis but also sheds light on the intricate relationship between systemic health and ocular pathology.Aims and Ojectives: To assess the prevalence of retinal manifestations and to study the various fundus changes in the patients with hematological disorders. Methodology: This is a study involving 60 patients having various types of blood dyscrasias, conducted in Krishna Institute of Medical Sciences, Deemed University, Karad. Results and observation: Out of 60 patients, 42% patients had anaemia, 53% patients had hematological malignancies and 5% patients had bleeding disorders. Out of those, 77% of patients had retinopathy. Discussion: The presence of retinal manifestations in hematological disorders underscores the importance of ophthalmic evaluation in patients with systemic diseases. These manifestations can vary widely, including hemorrhages, vascular changes, and ischemic events, reflecting the impact of hematological abnormalities on retinal microvasculature. Early recognition of these signs can aid in the diagnosis and management of underlying hematological conditions, improving overall patient outcomes.***

Keywords: Hematological disorders, Retinopathy, Anaemia, Hematological malignancies

1. Introduction

The presence of retinal manifestations in hematological disorders underscores the importance of ophthalmic evaluation in patients with systemic diseases. These manifestations can vary widely, including hemorrhages, vascular changes, and ischemic events, reflecting the impact of hematological abnormalities on retinal microvasculature. Hematological disorders commonly include Anaemia, Polycythemias, Leukemias, Lymphomas, Bleeding Disorders. Even though the retinal findings are not pathognomonic to these disorders and they may be observed in many other systemic illnesses, but their patterns are very much characteristic to each hematological disorder. Previous reports indicate that their indeed exists a link between haematological abnormality and ocular manifestations.[3] Early recognition of these signs can aid in the diagnosis and management of underlying hematological conditions, improving overall patient outcomes. Commonly found retinal manifestations in hematological disorders are Intraretinal hemorrhages, Cotton wool spots, Roth spots, Hard exudates, Vascular tortuosity and dilatation, Papilloedema, etc.

2. Methods and Materials

A total of 120 eyes of 60 patients with various age groups were studied from the period of January 2023 to February 2024 at Krishna Institute of Medical Sciences, Deemed University, Karad. These all were IPD patients in the department of Paediatrics, Medicine, Oncology and General surgery who were referred to Ophthalmology OPD for ocular examination. A valid consent was taken from all before the examination. A detailed history, systemic examination, treatment history was recorded along with ophthalmic examination which included Visual Acuity, Slit lamp Biomicroscopy and dilated Fundus evaluation. Data was recorded and statistical analysis was done.

3. Observations and Results

120 eyes of 60 patients having hematological disorders were examined.

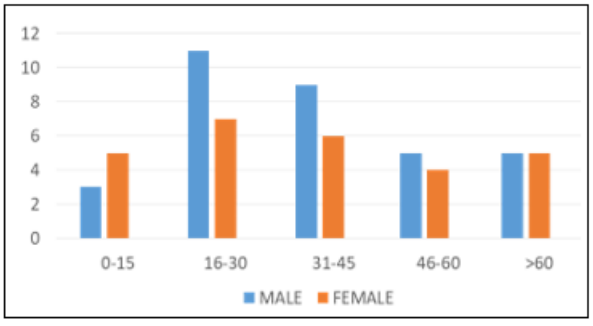

Figure 1: Age and Sex wise distribution

Amongst them, 55% were males and 45% were females, maximum patients lying in the age group of 16-30 years (18 patients)

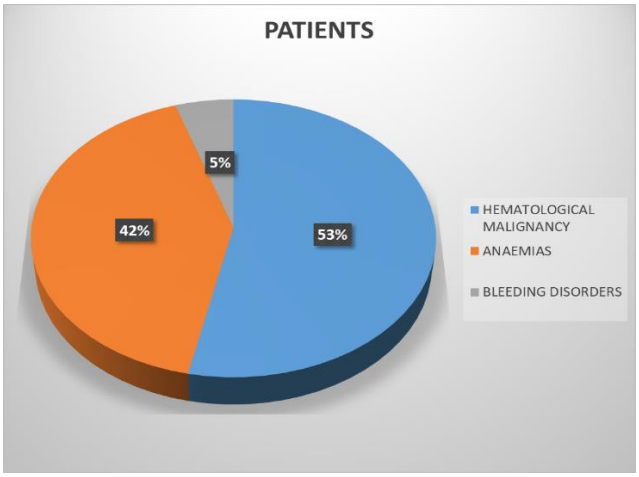

Figure 2: Distribution according to hematological disorders

42% patients had anaemia, 53% patients had hematological malignancies and 5% patients had bleeding disorders.

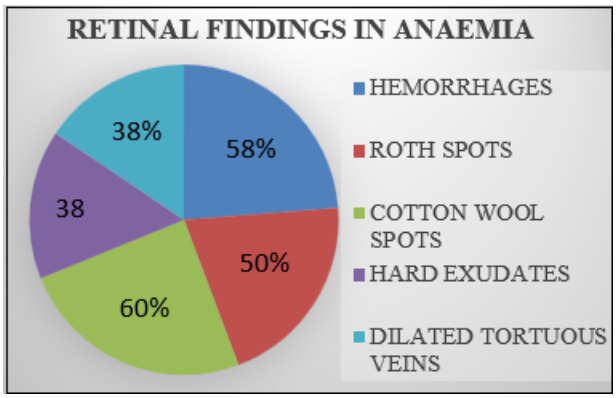

Figure 3: Retinal changes in Anaemia

In patients with anaemias, most common finding encountered was Cotton Wool spots (60%) followed by Retinal hemorrhages (58%).

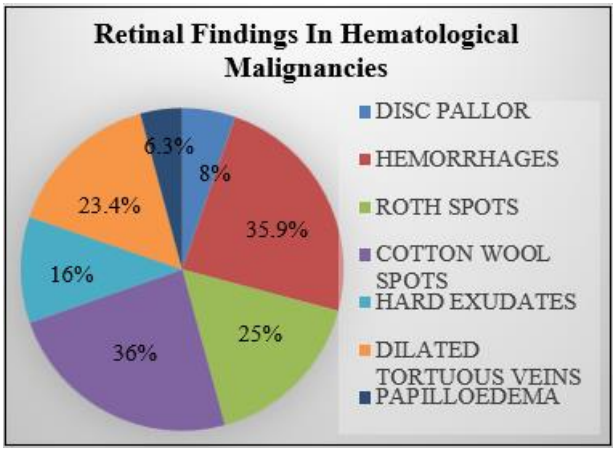

Figure 4: Retinal changes in Hematological malignancies

In patients with Hematological Malignancies, most common findings were Retinal hemorrhages and Cotton wool spots (36% each) followed by Roth spots (25%).

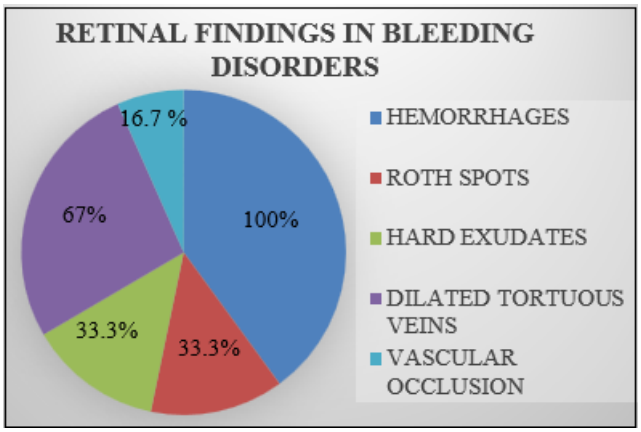

Figure 5: Retinal changes in Bleeding disorders

In patients with bleeding disorders, most common finding encountered was Retinal hemorrhages (100%)

4. Discussion

Retinal manifestations of blood dyscrasias, such as anemia, leukemias, and clotting disorders, are significant as they often serve as early indicators of systemic diseases. Retinal manifestations can frequently be the first sign of hematological disorders. It is very necessary for all patients with hematological disorders to undergo ophthalmologic evaluation. The most frequent retinal findings, in our investigation were Intraretinal hemorrhages, Roth spots and Cotton wool patches.

Among 60 patients, 46 (76.6%) had retinopathy. Out of these 46 patients, 34 (73.9%) patients were affected bilaterally.

Majority of our patients showed an Anaemic predominance (41.6%) followed by Leukemias (33.3%), Lymphomas (15%). In our study, 21 out of 25 patients (84%) with Anaemia, had retinal involvement. Among 25 diagnosed to have anaemia, highest percentage of patients had normocytic, normochromic anaemia (72%).

Among the 3 cases of Thrombocytopenia, all of them had retinal hemorrhages (100%), but none of them had bilateral eye involvement.

Our study shows, 23 of 32 patients (71.8%) with hematological malignancies had retinal involvement. Review of literature reveals Non Hodgkins lymphoma to be found more prevalent than Hodgkins lymphoma. [4] Non-Hodgkin lymphoma makes up 66.6% of the cases in our analysis, with Non-Hodgkins lymphoma making up 33.3%.
3 of 32 (9.4%) patients had optic nerve involvement. Neither patients with Anaemia nor with Bleeding disorders showed optic nerve involvement.

Venous dilatation was seen in 23.4% patients with hematological malignancies. Literature documents venous dilatation and tortuosity as the initial retinal change in leukemia.[4] In our entire study, only these 3 patients with optic nerve involvement had Vitreous hemorrhage. The internal limiting membrane functions as an efficient barrier to prevent leukemic cell infiltration and stops preretinal or subhyaloid hemorrhages from progressing further and

entering the vitreous cavity. Thus, hematological illnesses rarely present with vitreous hemorrhage. However, the vitreous may have been invaded from the optic disc in all three cases due to the involvement of the optic nerve.

5. Conclusion

This study emphasizes on the significant impact of hematological disorders on retinal health. Patients with hematological disorders are at risk of developing various ocular complications, ranging from minor changes such as conjunctival pallor to severe conditions like retinal hemorrhages and vascular occlusions. Early detection and management of these ocular manifestations are crucial to prevent vision loss and improve patient outcomes. Ophthalmic evaluation should be an integral part of the management protocol for patients with blood dyscrasias. Ophthalmologists and hematologists need to collaborate closely to monitor patients for ocular complications and implement appropriate interventions when necessary.

Moreover, this study underscores the importance of raising awareness among healthcare providers about the posterior segment ocular manifestations of hematological disorders. Timely recognition and intervention can significantly impact the prognosis and quality of life for patients with hematological disorders. Further research in this field is warranted to better understand the pathophysiology of ocular complications associated with hematological disorders and to develop more effective treatment.

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