Original Article

Fundus changes in patients with blood dyscrasias

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Abstract

Introduction: The retina is a great meeting place between Ophthalmology and general medicine. So in many systemic conditions, fundus examination helps in the diagnosis and/or prognosis of the condition. Various retinal manifestations are seen in the patients with blood dyscrasias. **Aims and Objectives:** To assess the prevalence of fundus changes and to study the spectrum of fundus changes in patients with blood dyscrasias. **Methodology:** This is a study involving 100 patients having various different types of hematological malignancies conducted in The Krishna Institute of Medical Sciences Deemed University, Karad. **Results and Observations:** Out of 100 patients, 51% patients had anemia, 43% patients had hematological malignancies and 6% patients had bleeding disorders. Out of those, 44% of the patients had retinopathy. **Discussion:** The retinal changes of blood dyscrasias are not uncommon as is proved by various clinical and pathological studies. These changes in the eye are due to the hemorrhagic effect of the blood disorders or due to infiltration by malignant cells.

Keywords: Dyscrasias, Retinopathy, Hematological malignancy.

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INTRODUCTION

The word "dyskrasia" is a greek derivation which means bad mixture. A disproportion of the four bodily fluids or humors: phlegm, blood, yellow and black bile. The imbalance is called as dyscrasia[1]. It is defined as the pathologic conditions or disorders such as leukemia or hemophilia in which the constituents of the blood are abnormal or are present in abnormal quantity[2]. They include – Anemia, Polycythemia, Leukemias and Bleeding disorders[3]. The typical ophthalmoscopic findings in the various blood dyscrasias are not pathognomic and may actually be observed in many different local and systemic diseases involving the eye (i.e., diabetes, hypertension, collagen vascular disease). However, the pattern and distribution of the retinal findings in blood dyscrasias are characteristic. If one identifies these characteristic findings on ophthalmoscopy, then ancillary testing may reveal a blood dyscrasia and allow for early referral for treatment by the appropriate medical subspecialist. Some of the retinal findings seen in patients with blood dyscrasias are Retinal haemorrhages (Roth spots, flame shaped haemorrhage), hard exudates, cotton wool spots (soft exudates), retinal vascular changes, pallor of the fundus[4-18] etc.

METHODS AND MATERIALS

A total of 100 patients with various age groups, irrespective of male or female were studied from the period of November 2014 to December 2016 at the Krishna Institute of Medical Sciences Hospital, Karad. The patients were admitted in the Departments of Pediatrics, Obstetrics and Gynaecology, Medicine and General Surgery. A valid consent of the patients was obtained prior to the examination. The findings of detailed history, blood and systemic examination and treatment history were recorded in the Proforma prepared for the study. Ophthalmic examination and investigations included visual acuity for near and distant vision,

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Intraocular pressure measurement with a Schiotz tonometer, complete Slit Lamp Bio microscopy of the anterior segment of the eyeball was done. Evaluation of the fundus was done using the direct as well as indirect ophthalmoscopy and findings were recorded on the proforma. Statistical analysis of the findings was done using chi square test and the results were used to compare the various hematological parameters with the incidence of retinopathy.

OBSERVATIONS AND RESULTS

The eyes of 100 patients having blood dyscrasias were examined in the study.

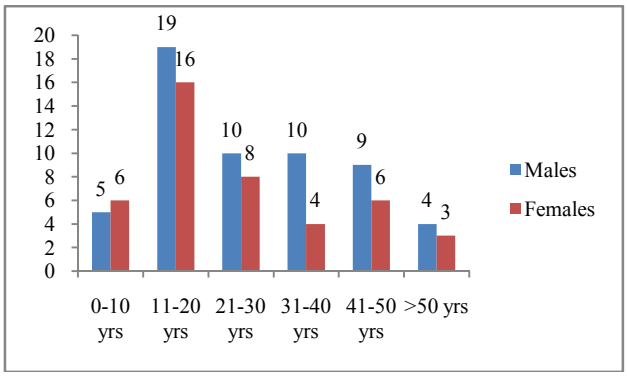

Figure 1: Age and Sex wise distribution

Amongst them, 57% were males and 43% were females, maximum patients lying in the age group of 11-20 yrs (35 patients)

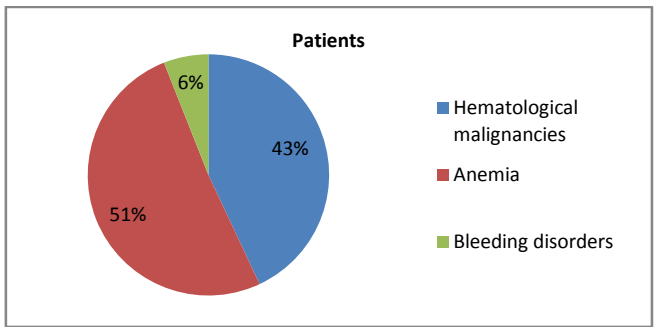

Figure 2: Distribution as per blood dyscrasias

51% of the patients had anemia, 43% of the patients had hematological malignancies and 6% of the patients had bleeding disorders.

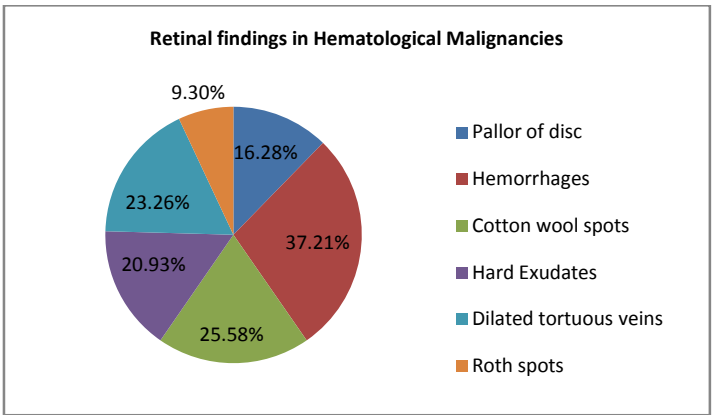

Figure 3: Fundus changes in Haematological Malignancies

In patients with Hematological Malignancies, most common finding was retinal haemorrhages (37.21%), followed by CWS (25.58%). (P value < 0.05).

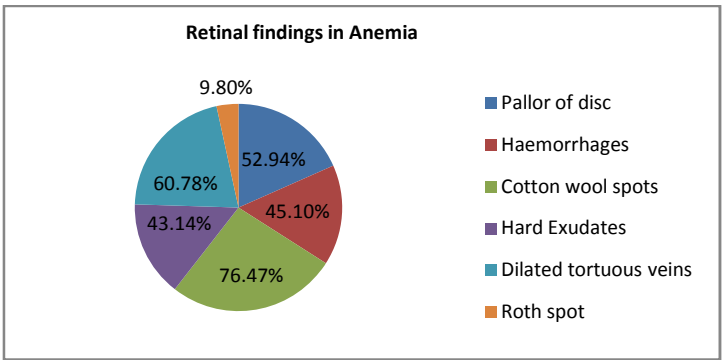

Figure 4: Fundus changes in Anemia

The most common finding encountered was Cotton Wool Spots (76.47%), followed by dilated tortuous veins (60.78%). (P value not significant)

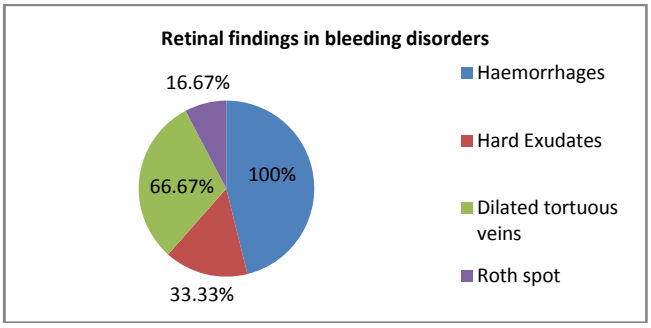

Figure 5: Fundus changes in bleeding disorders

There is a positive correlation between the findings and the blood disorder. The most common finding encountered was retinal haemorrhage (100%). (P value < 0.05).

DISCUSSION

Many studies and case reports highlighting the ocular manifestations of different blood dyscrasias are present in the literature. However, the results shown by them are not uniform and the significance of these changes and their relationship with hematological parameters have been reported differently by various studies. In the current study, 6 out of 100 patients had bleeding disorders, out of which 5 were suffering from Idiopathic thrombocytopenic purpura and 1 had hemophilia. 4 patients out of 6 (66.66%) showed ocular changes. Holt and Gordon-Smith[19] in their study did not find any retinal hemorrhage in cases that had thrombocytopenia as the sole abnormality in peripheral blood. However, Kataria *et al*[20] in their study of fundus, examined two cases of thrombocytopenic purpura and found retinal hemorrhage in one of them. Rubenstein, Daniel and Harold [21] in their study of 123 patients with hemophilia reported ocular findings (orbital or periorbital hemorrhage being most common) in 25 patients. In our study, a total of 43 patients were diagnosed with hematological malignancies, out of which 15 patients had AML, 11 had CML and 10 had ALL, 3 with CLL. The positive fundus findings in them was 53.40%(23 of 43).

Table 1: Comparison of incidence of retinopathy in hematological malignancies in different studies

Investiagator	Retinal involvement
Straatsma *et al* [22] (1961)	Most frequent
Holt and Gordon-Smith [19] (1969)	21 of 48 (44%)
Kincaid and Green [9] (1983)	106 of 357 (30%)
Kataria *et al* [20](1983)	28 of 50 (56%)
Schachat *et al* [23] (1989)	29 of 120 (24%)

Our study shows 23 of 43 (53.4%) patients had retinal involvement. In our study, a total of 51 patients were diagnosed with anemia out of which, 24 patients had iron deficiency anemia (47.06%).

Table 2: Comparision of retinopathy in patients with anemia in different studies

Investiagator	Retinal involvement
Rubenstein and Co-workers [21] (1968)	19 of 67 (28.35%)
Merin and Freund [24] (1968)	20 of 89 (22.5%)
Holt and Gordon –Smith [19](1969)	16 of 66 (24.25%)
Kataria *et al* [20] (1983)	6 of 40 (15%)

Our study shows 53.4% of retinal involvement in patients with anemia. In a 4-year prospective study of 82 patients with acute leukemia, Jackson and coworkers[25] found that patients with a macular hemorrhage were at significantly greater risk for developing intracranial hemorrhage [particularly in the promyelocytic (M3) subtype of acute myeloid leukemia (AML)] within the first 30 days following diagnosis compared with patients without a macular hemorrhage. Based on these findings, the authors recommended that patients with a macular hemorrhage be monitored intensively for the development of intracranial hemorrhage and receive priority in the allocation of platelets when platelets are in short supply. Richards and colleagues[26] also reported a high incidence of intraocular hemorrhage in patients with acute promyelocytic leukemia (M3 subtype of AML) and found no consistent detectable abnormalities in the hematologic parameters or coagulation studies predictive of ocular hemorrhage. In a pathologic study of the eyes of 76 patients who died of leukemia and allied disorders, Allen and Straatsma[22] found that retinal hemorrhage was the most frequent and serious ocular complication and that the most significant hemorrhages occurred in the acute forms of leukemia. In the current study, intraretinal haemorrhages were a significant finding in the patients having leukemias (37.21%) as well as patients having bleeding disorders (100%).

CONCLUSION

As per the study, the fundus showed numerous significant and non significant changes in the patients with blood dyscrasias. The fundus changes regressed after the improvement of blood picture by appropriate treatment measures.

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