International Journal of Current Research and Review
DOI: 10.7324/IJCRR.2018.1013

Case Report

IJCRR
Section: Healthcare
Sci. Journal
Impact Factor
4.016
ICV: 71.54

Secondary Ocular Involvement in Acute Myeloid Leukemia– M_0: A Rare Case Report

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ABSTRACT

We report a case of 45 year old female patient who presented with ocular pain and blurring of vision in both eyes (BCVA in right eye 0.1 logMAR and in left eye 0.1 logMAR). An ophthalmological evaluation revealed bilateral pale conjunctiva, vitreous degeneration, dilated and tortuous retinal vessels with multiple flame shaped and dot-blot haemorrhages, cotton wool spots and roth spots in both eyes. IOP in both eyes was 10 mm Hg. Haematological evaluation revealed the presence of Acute Myeloid Leukemia-M_0 (undifferentiated) with Hb 3.2 gm%. General physical examination showed severe pallor. On examination bilateral basal crepts and sternal tenderness found. Other causes of severe anaemia have been ruled out. This case documents the occurence of leukemic retinopathy in rare type of leukemia i.e Acute Myeloid Leukemia-M_0 (3-5% of Acute Myeloid Leukemia).

Differential diagnosis: Thrombocytopenia, Severe anaemia, Hyperviscocity.

Key Words: Acute Myeloid Leukemia– M_0, Roth spots, Basal crepts, Sternal tenderness, Leukemic retinopathy

INTRODUCTION

Acute Myeloid Leukemia is subdivided into $M_0 - M_7$. Acute Myeloid Leukemia- M_0 is rare (3 – 5 % of Acute Myeloid Leukemia).[3]Ocular involvement in leukemia is classified as (1) Direct or primary leukemic infiltration (2) Indirect or secondary ocular involvement. The direct leukemic infiltration show three patterns: anterior segment uveal infiltration, orbital infiltration and neuro-ophthalmic signs of C.N.S. The secondary changes are result of haematological abnormalities of leukemia such as anaemia, thrombocytopenia, hyperviscocity . These can manifest as retinal or vitreous haemorrhage and vascular occlusions.[1] The retina is involved more often than any other ocular tissue. It is estimated that 69 % of all patients with leukemia show fundus changes at some point of course of their disease.[4]

CASE REPORT

A 45 year old female patient referred to our ophthalmology department with complaint of ocular pain and blurring of vision in both eyes. She also had shortness of breath and easy fatigability. There was no history of any systemic afflictions such as Diabetes mellitus, HTN, any vasculitis, blood dyscrasias, blood transfusion. On general examination patient was calm, cooperative and conscious. Severe pallor was present, afebrile, P.R – 114/min, B.P – 130/90, R.R – 18/min. Systemic examination revealed bilateral basal crepitations and sternal tenderness.

On ophthalmological examination: Best corrected visual acuity was 0.1 logMAR (OD) and 0.1 logMAR (OS). Conjunctiva was pale. Slit lamp examination revealed bilateral vitreous degeneration. I.O.P was 10 mm Hg (OD) and 10 mm Hg (OS) by NCT. Dilated fundus examination showed clear media with normal sized optic disc. The vessels were dilated and tortuous with multiple flame shaped and dot blot haemorrhages in all four quadrants of eye. Multiple cotton wool spots and Roth spots were present in both eyes.

In R.N.T Medical College all routine investigations were performed in which Hb = 3.2gm/dl ; RBC = 1.14 m/cu mm; TLC = 14,400(raised) ; DLC = Lymphocytes = 58.5% (

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ISSN: 2231-2196 (Print) **ISSN:** 0975-5241 (Online)
Received: 17.10.2017 **Revised:** 08.11.2017 **Accepted:** 29.11.2017

High), Granulocytes = 24.6 % (Low) ; MCHC = 30.70 (low) ; Reticulocyte count = 2.00 ; ESR = 49 ; SGOT =546 (raised) ; SGPT (raised) ; HCV antibodies = NR ; MP QBC = negative ; VDRL = NR ; HBsAg = negative. Peripheral blood smear - RBC – moderate anisopoikilocytosis, moderate hypochromic, pencil cells seen

WBC – 18000 cells / cu mm (Raised count)

DLC – Blast cells: 50% (raised)

Lymphocytes: 10%

Polyneutrophils: 25 %

Band form: 7%

Myelocytes: 8%

PLATELETS – adequate in number.

HAEMOPARASITES – not seen

Based on these ophthalmological, systemic and haematological findings diagnosis of Acute Myeloid Leukemia– M_0 with CHF was made.

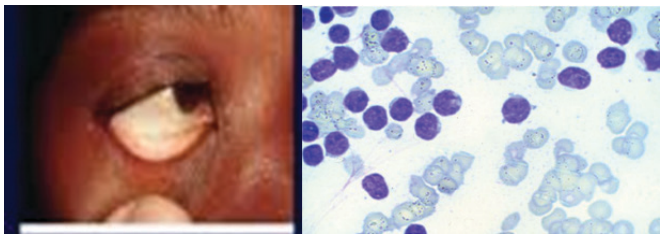

Figure 1: (a) Pale conjuctiva. (b) Peripheral blood film showing hypercellularity with Blast cells.

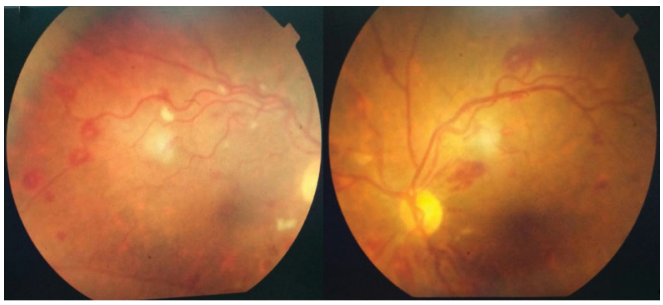

Figure 2: (a) Fundus photograph (OD) showing dilated and tortous vessels, superficial and deep retinal hemmorhages in all four quadrants with Roth spots and cotton wool spots. (b) Fundus photograph (OS) showing similar features.

TREATMENT RECEIVED

The patient received 2 units of blood transfusion(Packed Cell Volume), Vit B 12 and folate supplements and Injection Furosemide 2 amp I.V stat in our hospital and after she was diagnosed with Acute Myeloid Leukemia– M_0 patient was referred to Haemato – Oncologist for further management.

DISCUSSION

Leukemias are malignant neoplasms of haematopoetic stem cells, characterized by diffuse replacement of bone marrow by neoplastic cells. Ophthalmic involvement can be classified into two major categories (1)Primary or Direct leukemic infiltration (2.) Secondary or Indirect involvement. The direct leukemic infiltration show three patterns: anterior segment uveal infiltration, orbital infiltration and neuro-ophthalmic signs of C.N.S leukemia that include optic nerve infiltration, cranial nerve palsies and papilloedema. The secondary changes are the result of haematological abnormalities of leukemia such as anaemia, thrombocytopenia, hyperviscocity and immunosuppresion. These can manifest as Retinal or Vitreous haemorrhage, infections and as vascular occlusions. The ophthalmic manifestations of leukemia tend to involve more of posterior than anterior segment structures of eye and resulted more from secondary haematological complications rather than primary leukemic infiltration.[1]

In the era before effective antileukemic therapy, retinopathy was believed to be of no prognostic significance in acute leukemia. However recent reports have demonstrated that the presence of ocular involvement is associated with poor prognosis in acute childhood leukemias. Therefore it is important to consider an ophthalmic evaluation at the time of diagnosis of acute leukemia in adults and children[2].

The acute leukemias are characterized by replacement of bone marrow with very immature cells called BLASTS. Under normal conditions, blasts forms constitute fewer than 5% of nucleated cells of bone marrow and are seen in peripheral blood except during periods of profound over-production of blood cells. Blast cells are primitive precursors lacking many of features of differentiation. Lymphoid blasts are differentiated from myeloid blasts on the basis of standard morphologic and cytochemical differences, based on these acute leukemias are subdivided. Within French – American – British (FAB) classification, ALL has been subdivided into three types: L_1, L_2, L_3, while subdivisions of Acute Myeloid Leukemia are called M_0 – M_7. Acute Myeloid Leukemia-M_0 is rarest (3-5% of leukemias).[3]

The retina is involved in leukemia more often than any other ocular tissue. It is estimated that 69 % of all patients with leukemia show fundus changes at some point of course of their disease.[4]

The early manifestations (because of haematological disturbances) are venous dilation and tortousity.[5]

Haemorrhages may occur in all levels of retina, usually in posterior pole and may extend into vitreous. They may be round or flame shaped and often has white component. The white area consists of leukemic cells and debris, platelet fibrin aggregates or septic emboli. A similar clinical picture can be seen in severe anaemia, thrombocytopenia and hyperviscocity.[6]

Cotton wool spots can be seen and are probably due to ischaemia from anaemia, hyperviscocity or leukemic infiltrate[7]

In this case patients complete systemic, ophthalmological and haematological examination clearly demonstrates Acute Myeloid Leukemia– M_0 kind of Acute Myeloid Leukemia(Acute Myeloid Leukemia).

CONCLUSION

This is rare case entity as very few cases of ACUTE MYELOID LEUKEMIA– M_0 are reported in literature. Although the ophthalmologist has a secondary role in treatment of leukemia, a prompt recognition of the ocular manifestations and their importance as a sign of possible extramedullary disease is crucial if appropriate therapy is to be initiated. We suggest that full collaboration among Physicians, Oncologists, Haematologists and Ophthalmologists is needed with prompt ophthalmic assessment of patients suspected to have eye manifestations.

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