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Hemorrhagic Eye Involvement in Acute Myeloid Leukemia

Kougou Ntoutoume AR*, Mekyna S, Tachfouti S, Cherkaoui O

Ophthalmology Department A, Specialty Hospital, Faculty of medicine, Mohammed V Unisersity, Rabat, Morocco

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***Corresponding author:** Kougou Ntoutoume AR

Abstract **Case Report**

Purpose: Through an observation, we focus on the ocular hemorrhagic manifestations during AML and the role of the ophthalmologist in the management of this condition. ***Methods:*** We report the case of a 14-year-old boy whose hemorrhagic ocular involvement was indicative of an AML. ***Results:*** This patient with no known history was sent for an ophthalmology consultation for a sudden decline in bilateral visual acuity associated with a bilateral periorbital ecchymosis. The interrogation found an effort of vomiting preceding the ocular symptoms and a notion of purpuric spots on the lower limbs 3 months ago. Distance visual acuity has been rated at 1/10 on the right and counts the fingers on the left. Examination of the anterior segment mainly revealed periorbital ecchymosis and diffuse bilateral subconjunctival hemorrhage. Fundus analysis revealed bilateral diffuse retinal hemorrhage, premacular retro-hyaloid hemorrhage on the right and macular hemorrhage on the left. An emergency blood count showed anemia with hemoglobin (Hb) level of 5.5g/dL and thrombocytopenia at 15,000/µL. Hyperleukocytosis at 126420/µL with monocytes at 84700/µL and neutrophils at 3312/µL. The patient was immediately referred to a hematologist and an oncologist. The investigations and the myelogram made it possible to make the diagnosis of acute myeloid leukemia. ***Conclusions:*** Although the ophthalmologist plays a secondary role in the treatment of leukemia, he must be able to recognize the eye symptoms indicative of systemic disease and collaborate with hematologists and oncologists in the follow-up and management of patients.

Keywords: Hemorrhagic eye involvement, acute myeloid leukemia.

INTRODUCTION

Ocular hemorrhagic manifestations in acute myeloid leukemia (AML) are common and may be the initial manifestation of the systemic disease. They are often linked to blood disorders such as anemia and thrombocytopenia [1].

Through an observation, we focus on the ocular hemorrhagic manifestations during AML and the role of the ophthalmologist in the management of this condition.

CASE REPORT

We report the case of a 14-year-old boy whose hemorrhagic ocular involvement was indicative of an AML. This patient with no known history was sent for an ophthalmology consultation for a sudden decline in bilateral visual acuity associated with a bilateral periorbital ecchymosis. The interrogation found an effort of vomiting preceding the ocular symptoms and a notion of purpuric spots on the lower limbs 3 months ago.

Distance visual acuity has been rated at 1/10 on the right and counts the fingers on the left. Examination of the anterior segment mainly revealed periorbital ecchymosis and diffuse bilateral subconjunctival hemorrhage. Fundus analysis revealed bilateral diffuse retinal hemorrhage, premacular retro-hyaloid hemorrhage on the right and macular hemorrhage on the left.

An emergency blood count showed anemia with hemoglobin (Hb) level of 5.5g/dL and thrombocytopenia at 15,000/µL. Hyperleukocytosis at 126420/µL with monocytes at 84700/µL and neutrophils at 3312/µL.

The patient was immediately referred to a hematologist and an oncologist. The investigations and the myelogram made it possible to make the diagnosis of acute myeloid leukemia.

DISCUSSION

Leukemia is a malignant disorder of the hematopoietic stem cells characterized by an abnormal

proliferation of immature neoplastic leukocytes. It is classified as acute or chronic depending on the clinical evolution. Each group is subdivided into myelocytic or lymphocytic variants depending on the predominant cells involved [2].

The ocular involvement appears more often in myeloid leukemia than in lymphoid leukemia [3]. AML can occur at any age but only 25% of cases are diagnosed before age 25 [2] Its prevalence varies around 35 and 40% in adults [3,5] and 17.8% in adults. child [6]. And eye involvement is present at diagnosis in 36.4% of cases in children [6].

The ophthalmic manifestations of leukemia have been described in various studies and all ocular structures may be involved either before systemic diagnosis or during the evolution of the disease [3, 7, 8].

Ophthalmic involvement may result from direct infiltration by leukemia cells or from indirect ocular involvement due to secondary haematological abnormalities [2,9].

Among the ocular hemorrhagic manifestations, retinal damage is in the foreground [1, 3, 8, 10]. Leukemic retinopathy has been found in 50% of cases during AML [11]. The term "leukemic retinopathy" is used to describe the retinal manifestations of anemia, thrombocytopenia and hyperviscosity, rather than leukemic infiltration. Anemia and thrombocytopenia are more closely associated with acute leukemia. Hyperviscosity is more common in chronic leukemia [12].

Diffuse retinal and retro-hyaloid hemorrhages are the most described in patients with acute leukemia. They are located throughout the retina, and especially at the posterior pole. These attacks are almost always bilateral and can involve the visual prognosis. Concerning the rest of the posterior segment, vitreous hemorrhage is also described, especially in pediatrics [1,2].

Although the retina is the most common site of bleeding manifestations, other parts of the eye can also be involved. This is the case with appendages, which can be the site of bilateral palpebral and periorbital ecchymosis. It can appear spontaneously, or be caused by a minor trauma or Valsalva maneuver.

In the anterior segment, bilateral subconjunctival hemorrhages are frequent. Spontaneous hyphema has also been reported in children [13].

It has been shown that the presence of ocular involvement is associated with a poor prognosis in acute childhood leukemia [14-16]. Therefore, it is important to perform a systematic ophthalmologic examination at the time of diagnosis in patients with leukemia.

Hematologically, abnormal blood counts have been associated with an extremely high proportion of ophthalmologic manifestations [1, 2].

In a multivariate analysis, it appears that the hemoglobin (Hb) level is the best predictor of such manifestations and that the improvement in the Hb level from 5 to 7 g / dL leads to a significant reduction in the risk of developing retro-hyaloid hemorrhage. Likewise, maintaining a platelet count above 50,000 cells /mm3 dramatically reduces the risk of retro-hyaloid hemorrhages and overall ophthalmic manifestations [1].

In case of hemorrhagic ocular involvement, the ophthalmologist should order a complete blood count. And if leukemia is suspected, the patient should be promptly referred to the hematologist / oncologist.

CONCLUSION

Hemorrhagic eye involvement in acute myeloid leukemia results mainly from secondary hematologic complications rather than from primary leukemic infiltration. An association between blood parameters and these manifestations has been established.

Although the ophthalmologist plays a secondary role in the treatment of leukemia, he must be able to recognize the eye symptoms indicative of systemic disease and collaborate with hematologists and oncologists in the follow-up and management of patients.

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