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Biological Haematological Manifestations of HIV Infection

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Abstract: Introduction: Hematological abnormalities are common in people with HIV infection. These abnormalities may be due to HIV infection itself, opportunistic infections, HIV-related malignancies, or secondary to the treatments used in HIV infection. **Material and method:** We report a retrospective study spread over a period of 3 years, relating to patients whose haematological assessment was sent to the laboratory of the Avicenne military hospital in Marrakech. We included in this study, all HIV-positive patients. Excluded were HIV-positive patients for whom the myelogram was not requested. **Results:** 20 HIV positive patients whose myelogram was sent to the hematology laboratory. The average age was 37.46 years. The sex ratio was 0.5. Anemia was observed in 80% of patients. The most predominant type of anemia was normochromic normocytic anemia, found in 42% of cases. The total number of leukocytes ranged from 1,500 to 19,000 cells / mm^3. The number of platelets varied from 20,000 to 500,000 / mm^3. The blood smear was performed in all of our patients and who showed globular abnormalities. 2 smears had revealed the presence of lymphoblasts. The myelogram showed images of activated macrophages without hemophagocytosis in 25% of the cases, a macrophagic activation syndrome in 20% of the patients and an acute lymphoblastic leukemia type Burkitt in 10% of the marrow. The bone marrow was mostly reactive (45%). **Conclusion:** Haematological manifestations are frequent in patients infected with HIV. These abnormalities must be managed to reduce the patient's morbidity.
Keywords: HIV, hematological abnormalities, anemias, bone marrow.

Introduction

Hematologic abnormalities are common in people with HIV infection. Altered hematopoiesis, altered cytopenia and clotting mechanisms have all been described in individuals infected with HIV [1]. These abnormalities may be due to HIV infection itself, opportunistic infections, HIV-related malignancies, or secondary to the treatments used in HIV infection. In this study, we highlight the different hematological biological manifestations occurring in HIV infection.

Material and Method

We report a retrospective study spread over a period of 3 years from January 2017 to December 2019. Our work relates to patients whose hematological assessment, including an NFS and a myelogram was sent to the laboratory of the Avicenne military hospital in Marrakech. We included in this study, all HIV-positive patients. Excluded from the study were HIV-positive patients who were asked for only NFS.

Data collection was done by an exploitation sheet, bringing together epidemiological, clinical, biological, therapeutic and evolutionary data of patients. Data entry and analysis were carried out with EXCEL software and a descriptive method using simple variables.

Results

During the study period, 20 HIV-positive patients whose myelogram was sent to the hematology laboratory. The age varied between 19 and 72 years. The average age was 37.46 years. We noted a female predominance with 13 women (65%) and 7 men (35%), and a sex ratio of 0.5.

On the CBC, hemoglobin varied between 3 g / dl and 19 g / dl, the average globular volume (VGM) ranged from 62 to 130 fl and the average corpuscular hemoglobin concentration (CCMH) from 26 to 36 g / dl. Anemia was observed in 80% of patients. The most predominant type of anemia was normochromic normocytic anemia, found in 42% of cases. Microcytic and macrocytic hypochromic anemia were found in 30% and 8% of cases, respectively (Figure 1). 20% of patients had normal hemoglobin.

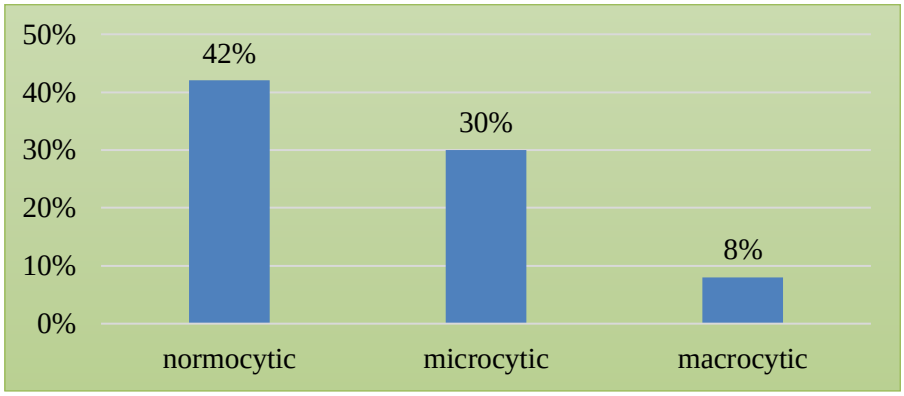

Figure 1. Distribution by type of anemia

The total number of leukocytes ranged from 1,500 to 19,000 cells / mm3. 75% of patients had a normal total leukocyte count. Leukopenia was observed in 20% of cases. Leukocytosis was observed in 5%.

The number of platelets varied from 20,000 to 500,000 / mm3. A normal platelet count of between 150,000 and 400,000 was observed in 80%. Thrombocytopenia was observed in 15% and thrombocytosis in 5%.

Pancytopenia was observed in 3% of the cases.

Table 1. Distribution according to CBC data

CBC setting	Normal	Low	High
Hemoglobin	20%	80%	-
Leukocytes	75%	20%	5%
Platelets	80%	15%	5%

The blood smear has been performed in all our patients and who have shown globular anomalies such as anisocytosis, poikilocytosis and red blood cells in rolls. 2 smears had revealed the presence of lymphoblasts.

The bone marrow was normocellular in the majority of cases (80%). It was hypercellular and hypocellular respectively in 11% and 9% of the patients. The myelogram revealed images of activated macrophages without hemophagocytosis in 25% of the cases (n=5), a macrophagic activation syndrome in 20% of the patients (n=4) and a Burkitt type acute lymphoblastic leukemia in 10% marrow (n=2). The bone marrow was mostly reactive (45%) (Figure 2).

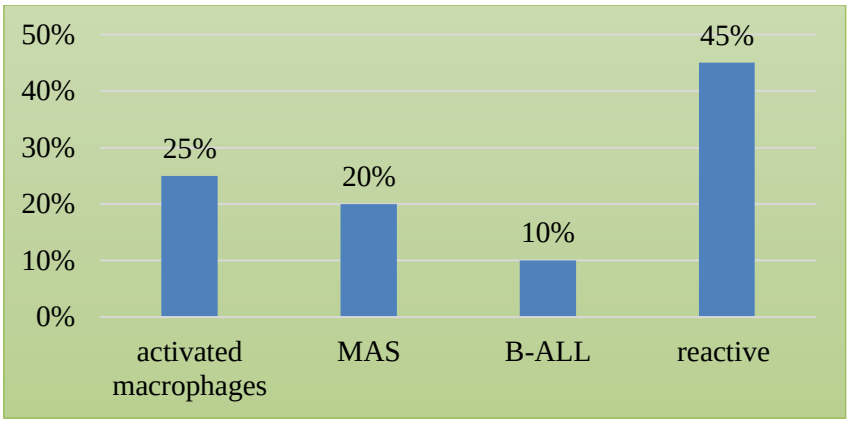

Figure 2. Bone marrow abnormalities

Discussion

The hematological abnormalities frequently encountered in people infected with HIV are anemia, granulocytic disorders, thrombocytopenia, lymphomas, coagulopathies and vascular malignant tumors such as Kaposi's sarcoma [2].

The pathogenesis of anemia, neutropenia, and thrombocytopenia in patients with HIV infection remains an unknown phenomenon, but is believed to be multifactorial. Anemia can occur at any stage of HIV infection and its prevalence and severity are correlated with the progression of the disease [3]. Inflammatory cytokines play a central role in the pathogenesis of anemia. TNF, IL-1 and interferon gamma have all been shown to inhibit erythropoiesis in vitro [4].

The mechanism of thrombocytopenia in HIV infection appears to involve increased destruction of platelets and inefficient production of platelets. Megakaryocytes express CD4 and CXCR4 and are susceptible to HIV infection [2].

In this study, anemia was found in 80% of patients. A similar study was carried out by Parinitha [2] in which anemia was present in 84% of the patients. Tripathi [5] also reports the presence of anemia in 82.4% of cases, while Sitalakshmi [6] reports its presence in 64.2% of cases. Normochromic normocytic anemia was the most prevalent, found in 42% of patients. The same is true for the studies of Tripathi [5], Khandekar [7] and Parinitha [2] which reported the prevalence of normochromic normocytic anemia in 72.9%, 48.57% and 40.4% respectively of their patients.

The white blood cell count was normal in 75% of the cases while leukopenia was present in 20% of the patients. The latter was similar to the rate reported by Tripathi [5] whose leukopenia was observed in 25.6% of patients. On the other hand, Parinitha [2] reports leukopenia in 65.2% of its patients. Thrombocytopenia was observed in 15% of patients. A rate similar to the results of the Patwardhan [8] and Parinitha [2] series, which reported thrombocytopenia in 13% and 18% of patients, respectively (Table 2).

Table 2. Comparison of CBC data with the literature

CBC setting	Parinitha [2]	Tripathi [5]	Notre étude
Anemia	84%	82,4%	80%
Normochromic normocytic anemia	40,4%	72,9%	42%
Leukopenia	65,2%	25,6%	20%
Thrombocytopenia	18%	-	15%

We found images of activated macrophages without hemophagocytosis in 25% of the cases, a macrophagic activation syndrome in 20% of the patients and an acute lymphoblastic leukemia type Burkitt in 10% of the marrow.

Macrophagic activation syndrome with hemophagocytosis can occur at any stage of HIV infection. It may be due to an active opportunistic infection or more rarely to HIV itself [10].

Infection with the acquired immunodeficiency virus predisposes to malignant lymphomas. A study published in 2001 [11] reports an increased incidence of tumors compared to the general population, in particular leukemias and myeloma. This could be explained by the increased incidence of myelodysplasia during HIV infection [12].

In the Tripathi series [1], he noted respectively 20%, 3% and 1% of granulocytic, erythrocytic and megakaryocytic dysplasia in the non-AIDS and AIDS groups. Sharad [9] reported finding abnormal cells in the bone marrow: plasma cells in 18 out of 160 patients, histocytes in 4 patients and toxic granulations in 3 patients.

Conclusion

Haematological manifestations are common in patients with HIV infection. Anemia is the most common of these manifestations and is often normochromic normocytic. Many patients also have lymphopenia and thrombocytopenia. Neoplastic processes account for a large part of morbidity and mortality. These hematological abnormalities must be managed to reduce the patient's morbidity.

Conflict of Interest: The authors declare that they have no conflicts of interest.

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