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RESEARCH ARTICLE

STUDY OF HEMATOLOGICAL ANOMALIES DURING ANTIRETROVIRAL TREATMENT AT THE SAINT-LOUIS REGIONAL HOSPITAL CENTER

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ABSTRACT

The aim of this work is to describe the anomalies of the blood count and the factors associated with them during antiretroviral treatment (ARV) at the Regional hospital center of Saint-Louis Hospitalier Régional de Saint-Louis. We carried out a cross-sectional descriptive study which took place from February 2 to 28, 2020. The population of our study was that of Persons living with VIH (PLVIH) aged 18 years or over, on antiretroviral treatment for at least 06 months, and having agreed to participate in the study by signing the free and informed consent form. **Results:** A total of 100 patients were included in the study, 65% of whom were female, for a sex ratio of 0.54. The mean age of the patients was 44.97 with ranges ranging from 20 to 72 years. The mean duration of antiretroviral therapy was 93.74 ± 58 months (7 - 203). The most frequently encountered anomaly was anemia (33%) with an average hemoglobin level of 12.67 ± 1.77g / dl. It is hypochromic microcytic in 24.2% of patients, normochromic normocytic in 60.6% and normochromic macrocytic in 15.2%. The other anomalies observed were: neutropenia (31%), lymphopenia (18%), leukopenia (11%). On univariate analysis, factors associated with anemia are gender (p = 0.01) and treatment with AZT (p = 0.008). Lymphopenia is 22.2% present in WHO stage 1 and 77.8% in stage 2. It is associated with HIV 1 (p = 0.032) and WHO stage 3 (p = 0.022). **Conclusion:** Haematological abnormalities remain a major comorbidity in patients with HIV. The anemia is frequent, severe and predominantly normochromic normocytic in our patients.

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INTRODUCTION

HIV infection attacks various body systems, including the hematopoietic system. Indeed during HIV infection, hematological anomalies are common; this is how the first observations of pancytopenia associated with AIDS were described in 1983 (Ba-Fall, 2004). In sub-Saharan Africa, the benefit of triple therapy during HIV infection is well established (Ba-Fall, 2004). However, this treatment is associated with numerous side effects, in particular, hematological complications, which can be caused by the virus itself, opportunistic infections affecting the hematopoietic organs or conditions secondary to toxicity of antiretroviral drugs, in particular zidovudine (AZT) (Beuzit, 1992). Despite the development of various treatments in order to control this disease, this pandemic remains a major problem in developing countries and hematological anomalies are frequent and often of great prognostic value in the evolution.

In sub-Saharan Africa, hematological parameters in patients on ARV treatment remain poorly documented. The objective of this study is to describe blood count anomalies, their prevalence and the factors associated with them.

PATIENTS AND METHODS

We carried out a descriptive and analytical cross-sectional study, at the regional hospital center of Saint-Louis, which took place from February 2 to 28, 2020. The population of our study was that of PLHIV aged 18 or over, on antiretroviral treatment for at least 06 months with a stable clinical condition, and who agreed to participate in the study by signing the free and informed consent form. The non-inclusion criteria were refusal to sign the consent form, patients under 18 years of age, pregnant patients, patients on treatment for anemia, or on haematopoietic growth factor.

We studied the socio-demographic data of our patients including age, sex, duration of treatment as well as blood count data. Data entry was done using Excel version 2010 software. Statistical analyzes were done using SPSS version 23.0 software. They included a descriptive study of the different variables according to sex. Student's and Pearson's Chi-square tests were used to compare the different means and proportions. Binary logistic regression analyzes made it possible to identify the explanatory variables associated with hematological anomalies, specifying for each of them the strength of the association (odds ratio) and its significance ($p < 0.05$).

RESULTS

A total of 100 patients were included in our study, corresponding to 36% of the total population of persons living with HIV (n = 278) followed at the regional hospital center of Saint-Louis. The sex ratio was 0.54 and the average age of patients was 44.97 years with extremes ranging from 20 to 72 years. The distribution of patients according to viral serotype finds 97% of HIV 1, 1% of HIV2 and 2% of HIV1-HIV2 association. The majority of patients, i.e. 34%, are classified as WHO stage 1 at the start of treatment.

Table I. Frequency of first-line regimens

	Frequency	Percentage
AZT+3TC+EFV	22	22,0
AZT+3TC+IDV	4	4,0
AZT+3TC+NVP	33	33,0
DDI+3TC+EFV	3	3,0
DDI+3TC+IDV	1	1,0
DDI+3TC+NVP	1	1,0
TDF+3TC+EFV	34	34,0
TDF+3TC+NVP	2	2,0
Total	100	100,0

AZT=Zidovudine, 3TC=Lamivudine, DDI= Didanosine, TDF=Ténofovir, EFV=Efavirenz, IDV=Indinavir, NVP=Névirapine

Table II. Average of the parameters of the hemogram

	Minimum	Maximum	Meduim	Ecart type
Hemoglobin (g/dL)	7,3	16,3	12,676	1,7726
Mean corpuscular volum (fl)	68,8	114,3	93,282	9,6424
Mean corpuscular hemoglobin content (pg)	20,4	40,5	30,947	3,9802
Mean corpuscular hemoglobin concentration (g/dl)	27,80	36,90	33,1236	1,43906
Leucokyt ($10^3/\mu L$)	2,58	9,93	5,0123	1,30872
Neutrophils ($10^3/\mu L$)	0,64	7,95	2,4100	1,15019
Lymphocyt ($10^3/\mu L$)	0,02	4,13	1,9268	0,69402
Eosinophil ($10^3/\mu L$)	0,01	1,74	0,1860	0,22258
Platelets ($10^3/\mu L$)	158	527	309,57	76,931

Table III. Distribution of anemia

Distribution of anemia	Frequency	Percentage
Normocytic	20	60,6
Microcytic	8	24,2
Macrocytic	5	15,2
Total	33	100,0

The average duration of antiretroviral treatment was 93.74 ± 58 months (6 – 203). The dominant treatment regimen combined two nucleoside reverse transcriptase inhibitors (NRTIs) and one non-nucleoside reverse transcriptase inhibitor (NNRTI) in 91% of cases.

The NRTIs used were lamivudine in all patients, zidovudine in 63% of patients and tenofovir in 36% (Table I). The NNRTIs used are efavirenz in 37 patients (37%) and nevirapine in 34 patients (34%). The average hemoglobin is 12.6 g/dl with extremes between 7.3 and 16.1 g/dl. The Hb level is between 7 and 10 g/dl in 27.3% of cases and greater than 10g/dl in 72.7%. Table II summarizes the mean data for the different blood count variables. Analysis of red blood cell morphology showed that normochromic normocytic anemia was the most frequent in our study with 60.6%. We also note that 24.2% had normochromic microcytic anemia, and 15.2% had normochromic macrocytic anemia (Table III). In univariate analysis, the factors associated with anemia are gender ($p=0.01$) and AZT treatment ($p=0.008$). Leukopenia and lymphopenia are present in 11% and 18% of patients respectively. leukopenia is exclusively found in HIV 1 but we have no statistically significant association ($p=0.536$). Lymphopenia is present at 22.2% in WHO stage 1 and 77.8% in stage 2. It is associated with HIV 1 ($p=0.032$) and WHO stage 3 ($p=0.022$).

DISCUSSION

The average age of 44.97 years with extremes between 20 and 72 years. This result is similar to that of Woldeamanuel *et al*. (3); who found in 2017 in Ethiopia, an average age of 40.6 years. We notice that this modal class represents the most active one of the population. These results are comparable to those of Deguenonvo *et al*. (4) in Dakar in 2011 who found that 75% of their subjects were in the 20 to 50 age group. In our work, the first hematological anomaly is anemia present in 33% of patients, with a predominance of normochromic normocytic anemia. The frequency of anemia is reported to varying degrees by different authors. Talom in Mali found a prevalence of 95.5% (5). Malyangu *et al*. in Zimbabwe obtained a result that is superimposable with them, i.e. 95.2% (6). These rates are much lower than those found by Nacoulma, Y. Some (7) and those found by Sagna Y. on the study of the biological profile of patients newly treated for HIV infection in Ouagadougou (Burkina Faso). with a frequency of 71.1% (8). This improvement in the hemoglobin level in our study could be explained on the one hand by the well-conducted ARV treatment with a better knowledge of the molecules and taking into account possible hematological complications. Kassogue (9) found 11.9% severe anemia 3.1% moderate anemia, E.W.C. Nacoulma and Coll. (7) in Ouagadougou reported 51.4% anemia during their study. HIV 1 was predominant with 97% followed by HIV 1+2 (2%) and HIV 2 (1%). KONE K in his 2007 study in Mali on anemia in subjects living with HIV found 97.3% for HIV 1 (10). This is due to the fact that HIV 1 is more prevalent in the world than the other types. Anemia during HIV is generally normochromic normocytic as shown by our study without however obscuring the possibility of occurrence of hypochromic microcytic anemia (24.2% in our case). The second haematological abnormality is neutropenia in 31% of patients, followed by lymphopenia in 18% of cases, against leukopenia in 11%. According to the study by André Loua on the hematological profile of HIV-infected patients in Conakry, leucopenia and neutropenia were present with respectively 21.7 and 15.2% (11). And according to the study by Sagna Y. and Diallo, neutropenia and lymphopenia were present with respectively 49.6 (8) and 36.4% (12). Overall, their frequency is variable: from 57 to 76% in patients at the AIDS stage and

from 19 to 41% in patients with polyadenopathy (13, 14). In our study, 91% of patients were under the 2INTI + 1INNTI regimen. This is because HIV 1 was predominant (97%). In univariate analysis, the factors associated with anemia are gender (p=0.01) and AZT treatment (p=0.008). A study carried out in Mali showed that infections and the WHO clinical stage were the predictive factors (associated) with the occurrence of severe anemia. Similarly, our results were similar to those of a study by Mugisha *et al*. (15) in 2008 in Uganda.

CONCLUSION

Hematological anomalies remain a major comorbidity in patients with HIV. Anemia is frequent, severe and mostly normocytic normochromic in our patients. The control of the complete blood count is an essential element in the follow-up of the antiretroviral treatment of persons living with HIV.

REFERENCES

Ba-Fall K, Gueye PM, Lefevre N, Fall IS, Said Ali Saindou N et al.- évolution du traitement antirétroviral de l'infection à VIH/SIDA à l'hôpital principal de Dakar. Méd. Trop, 2004, 64, 292-293.

Beuzit Y, Bougarel J et Ngouonimba J- Modifications hématologiques périphériques et médullaires lors de l'infection par le VIH en Afrique centrale. Méd. Trop, 1992, 40,193-199.

Woldeamanuel G G, Wondimu D H. Prevalence of anemia before and after initiation of antiretroviral therapy among HIV infected patients at Black Lion Specialized Hospital, Addis Ababa, Ethiopia: a cross sectional study. BMC Hematol [Internet]. 15 mars 2018 [cité 19 janv 2019];18. Disponible sur: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5856395/

Fortes Deguenonvo L, Diop M, Dia B, Seydi N. Profil actuel des patients infectés par le VIH hospitalisés à Dakar (Sénégal). Bull. soc. Pathol. Exot. 2011 No 104 P336-370.

Talom Fogue J. Profil de l'hémogramme chez les patients atteints de VIH/sida en milieu hospitalier de Bamako. Hématologie, Maladies infectieuses, Virologie. Bamako, 2005.

Malyangu E, Abayomi EA, Adewuyi J and Coutts AM: AIDS is now the commonst clinical condition associated with miltilineage blood cytopenia in a central referral hospital in Zimbabwe. Cent Afr \Med.2000; 46(3): 59-61

Nacoulma E.W.C. et Coll., Evolution des paramètres hématologiques au cours du traitement antirétroviral chez les patients infectés par le VIH au Burkina Faso.Thèse 15-0205.www.pathexo.fr/articles.bull.

Sagna, Y., et al., Profil biologique des patients nouvellement pris en charge pour une infection à VIH à Ouagadougou (Burkina Faso). Médecine et Santé Tropicales, 2014. 24(3): p. 307-311

KASSOGUE O., Etude de quelques paramètres biologiques de suivi du vivant avec le VIH. Thèse pharm.Bamako, 2003.

Koné K. L'anémie chez le sujet vivant avec le VIH [Thèse pharmacie]. [Bamako]: Université de Bamako; 2007.

Loua, A., et al., Profil hématologique des patients infectés par le VIH à Conakry. Hématologie, 2011. 17(5): p. 365-369.

Diallo D, Baby M, Dembele M, Keita A, Sidibe A T, Cisse I A et al. Fréquence, facteurs de risque et valeur pronostique de l'anémie associée au VIH/sida chez l'adulte au Mali. Bull Soc Pathol Exot 2003; 96: 123-7.

Moizan, H., A. Lagarde, and G.A. Del Valle, Bilan biologique du patient VIH+ en chirurgie buccale. Médecine Buccale Chirurgie Buccale, 2002. 8(2): p. 97-107.

Oumar AA, Dao S, Goita D. Particularités de l'hémogramme de l'adulte atteint de VIH/Sida en Afrique : à propos de 200 cas en milieu hospitalier de Bamako au Mali. Louvain médical 2009 ; 128 :73-8 ;

Mugisha JO, Shafer LA, Van der Paal L, Mayanja BN, Eotu H, Hughes P, et al. Anaemia in a rural Ugandan HIV cohort: prevalence at enrolment, incidence, diagnosis and associated factors. Trop Med Int Health TM IH. juin 2008;13(6):788- 94.

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