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Biochemical Profile of People Living with HIV

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Abstract

Background: *The human immunodeficiency virus (HIV) is a retrovirus that infects humans. It is responsible for acquired immunodeficiency syndrome (AIDS), which is a weakened state of the immune system that makes it vulnerable to multiple opportunistic infections.*

North Africa and the Middle East remain even less affected by the HIV epidemic. In 2017, the number of people living with HIV is estimated at 220,000, including 18,000 reported to have contracted the disease during the year. AIDS killed an estimated 63,200 people in 2017.

Sub-Saharan Africa remains the most affected region. In 2017, the number of people living with HIV in this part of Africa was estimated at 19.6 million, of whom 800,000 contracted the disease during the year.

In Mali, the first case of AIDS was identified in 1985 at the Gabriel Toure Universitary Hospital Center. Since 2001, the response to the epidemic has taken on a multi sectoral dimension and is coordinated by the High National AIDS Council.

Objective: *The purpose of this study is to determine the rate of some biochemical parameters in people living with HIV.*

Methods: *Samples from 1018 HIV-positive people from various sources were analyzed. The dosed parameters were prescribed by the treating physicians. After identification and centrifugation of the samples, the sera were collected and assayed using the KENZA TX 240 PLC, which previously contained the protocols for the parameters to be assayed and the reagents.*

Results: *At the end of the analyses, it appears that gender was predominant and age ranged from 1 to 75 with 39 - 59 as the majority age group. Blood glucose levels were normal in 64.9% of cases and normal creatinine levels were 67.5%. While those of the ASAT and ALAT were 77.2% and 89.3% respectively. The cholesterol concentration was 74. % and the triglyceride concentration was 68.2%.*

Conclusion: *Ultimately, the biochemical parameters analyzed are all normal in people living with HIV who require the analysis of other biochemical parameters on a regular and sustained basis.*

Keywords: *HIV, biochemical profile, PLWHA*

1. INTRODUCTION

The human immunodeficiency virus (HIV) is a retrovirus that infects humans. It is responsible for Acquired Immunodeficiency Syndrome (AIDS), which is a weakened state of the immune system making it vulnerable to multiple opportunistic infections. It is transmitted through several body fluids (blood, vaginal secretions, semen, pre-ejaculatory fluid or breast milk). HIV contamination, and its development to the AIDS stage, is now considered a pandemic that has caused the death of approximately 25 million people between 1981 (date of first identification of AIDS cases) and January 2006. It is estimated that about 1% of people aged 15-49 are living with HIV, mainly in sub-Saharan Africa [1, 2, and 3].

The first sero prevalence survey conducted in 1987 yielded an estimated prevalence of 1-5% in the general population, a high prevalence among sex workers (39%) and a low prevalence among pregnant women in urban areas of 1% [4].

In 2016, Mali recorded 5900 new HIV infections and 6100 AIDS-related deaths. In 2016, 110 000 people were living with HIV, 35% of whom had access to antiretroviral treatment. Among pregnant women living with HIV, 35% had access to treatment or prophylaxis to prevent HIV transmission to their children [5].

Increased access to antiretroviral treatment has significantly increased patient survival and comfort. However, for treatment to be more effective, it is imperative to have good immunological and virological monitoring of patients.

Biological monitoring is therefore essential for the effective management of people living with HIV. The initial assessment of patients and the follow-up of treated and untreated patients is based on the measurement of certain biochemical parameters (transaminases, amylases), haematological parameters (CBC), the measurement of circulating CD4 T lymphocytes and the viral load expressing RNA copy number in blood or breast milk 2.

2. Material and Methods

2.1. Study Population

The study was carried out on 1018 samples of seropositive people from the Centre d'Ecoute, de Soin, d'Animation et de Conseils; the Centre National d'Appui à la Maladie; the Forces Armies Maladies; Point G Hospital and Gabriel Touré Hospital with more or less different biochemical parameters

2.2. Dosing of Biochemical Parameters

The tubes were immediately identified and centrifuged at 2000 rpm for 5 minutes. After centrifugation, the sera were taken from the pre-numbered cuvettes.

The KENZA TX 240 is switched on and the reagents for glucose, creatinine, cholesterol, triglycerides and transaminases were placed in the KENZA TX 240 in the indicated positions. Calibration and quality control of the reagents was done with the normal control sera and with the reagent multivibrator.

Patient names were recorded on the KENZA TX 240 by selecting the requested analysis and cell positions. The cells were placed in the selected positions.

3. Results and Discussion

3.1. Distribution of Samples by Gender

At the end of the work, the samples were divided according to gender.

Figure 1 shows the distribution of the sample by gender

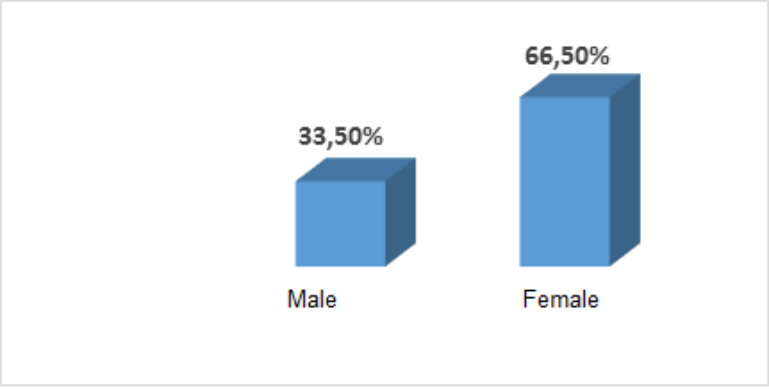

Figure1. *Gender Distribution of the Sample*

During our study period, the female sex was in the majority with 66.5%. The distribution of infected subjects shows a predominance of infected females with 66.50%. This is in agreement with several authors Déné who found 73.2% in 2010, who had worked on monitoring the biological parameters of people living with HIV on ARV treatment at EPH in Gao, Mali and Mamadou found 55.10% in 2004, who studied the lipid profile of PLWHIV according to immune status in Ouagadougou [7]. This could be explained by their greater vulnerability, socio-cultural constraints and their physiological make-up, which make them more susceptible to HIV infection.

3.2. Distribution of Samples by Age Group

The age distribution of the sample is shown in Figure 2.

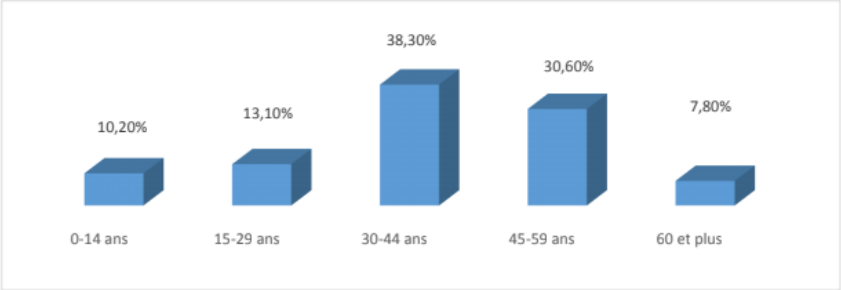

Figure2. *Age distribution of the sample*

During our study period, the 1018 people living with HIV received were between the ages of 1 and 75. The age groups 30-44 and 45-59 were in the majority with 38.3% and 30.6% of patients respectively, which shows that children and adolescents are less contaminated. The age groups 30-44 years and 45-59 years were in the majority with 38.3% and 30.6% of patients respectively. This result is comparable with that of Kibangou in 2004 in Congo, where the 29-51 age group was also the majority age group [8]. These age groups correspond to the most sexually active segments of the population. Patients on ARV treatment were more represented with 60.10% than the inclusion patients, which may indicate a decrease in infection.

3.3. Distribution of Samples According to Blood Glucose Status

Figure 4 shows the distribution of the sample as a function of blood glucose status.

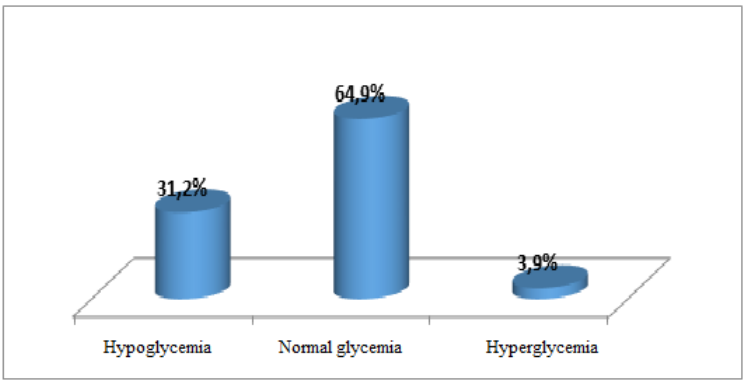

Figure4. *Sample distribution according to blood glucose status*

Most blood glucose levels were in the normal range with 64.9% compared to 3.9% for hyperglycemia. At inclusion, hypoglycemia was 31.9% close to that of Déné who found that in 37.5% of cases normal blood glucose was 63.3% [9]. This can be explained by the fact that the patients came in advanced stages of the disease.

3.4. Sample Distribution by Creatinine Level

Figure 5 shows the distribution of the sample by creatinine level.

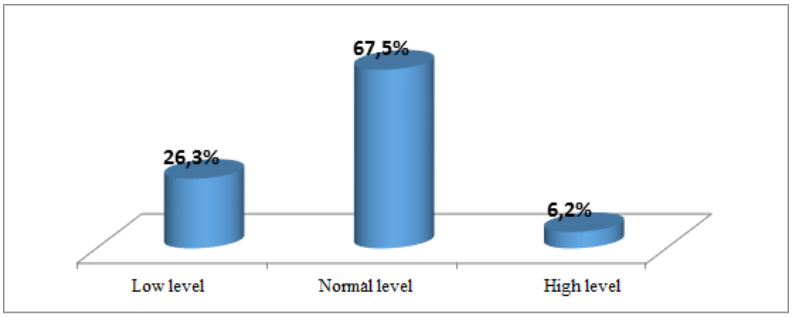

Figure5. *Sample Distribution by Creatinine Level*

The normal creatinine level is 67.5% with a low of 26.3% and a high of 6.2%. The normal creatinine level is higher than that of the patients in inclusion at 68.8% but with an increase in hyper creatinine with 10.7% of cases probably due to renal toxicity of ARVs, close to that found by Déné 7.3% at M6 but much lower than the result of Dicko who found 24.6% of cases. Normal creatinine was 66.0% lower than Déné's 92.7%, and renal disease was observed in 8.4% of cases similar to Dicko's finding of 8% abnormal [9, 10].

3.5. Distribution of Samples by AST Level

Figure 6 shows the distribution of the sample by AST rate.

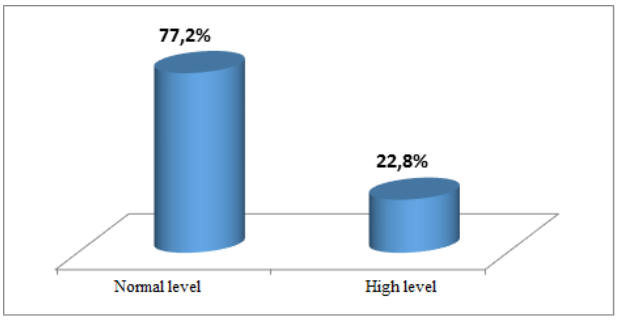

Figure6. *Sample Distribution by AST Rate*

The normal AST value is 77.2% compared to a high rate of 22.8%.

3.6. Distribution of the Sample by ALT Level

Figure 7 shows the distribution of the sample by ALT levels.

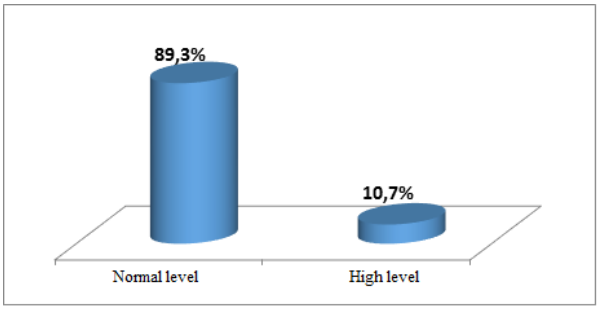

Figure7. *Sample Distribution by ALT Rate*

Patients with normal ALT levels represent 89.3% compared to a minority of high ALT levels of 10.7%. The normal AST level was 79.5% and a normal ALT level of 89.6% while 20.5% and 10.4% respectively had elevated AST and ALT levels. This may be due to an advanced stage of the disease. Dicko had found 89.3% during the follow-up of patients under treatment in 2006 at the Infectious Diseases Department of the University Hospital Centre of Pont G and 92.7% for Dene of normal ALT levels. The normal values for ALT and AST were 89.0% and 75.8% respectively and the elevated AST was 24.2% and 11.0% for ALT higher than the inclusion patients, this decrease in normal transaminase levels is explained by the efficacy of the treatment. Dene had found 83.2% and Dicko 95.7% of cases with normal ALT levels [9, 10].

3.7. Distribution of Samples by Cholesterol Levels.

Figure 8 shows the distribution of the sample by cholesterol level.

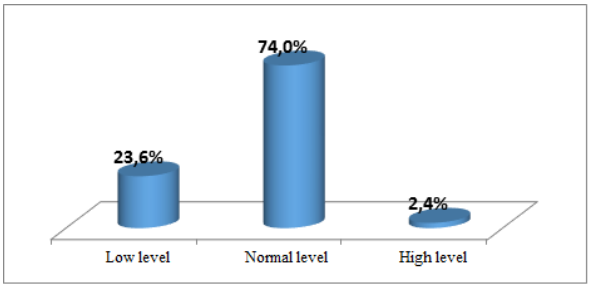

Figure8. *Sample distribution by cholesterol level*

The normal value for cholesterol is 74.0% with 23.6% low and 2.4% high.

3.8. Distribution of Samples by Triglyceride Level

Figure 9 shows the distribution of the sample by triglyceride level.

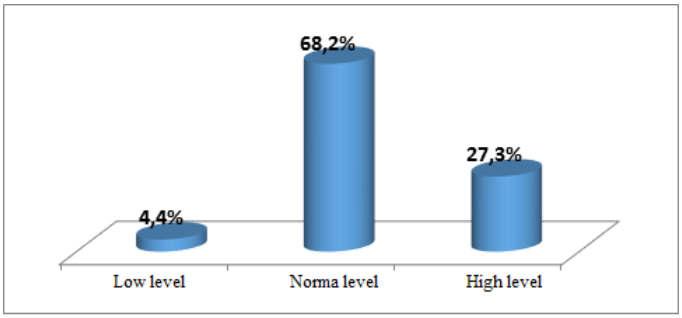

Figure9. *Sample distribution by triglyceride level*

Patients with a normal triglyceride value were 68.2% with 27.3% high and 4.4% low triglycerides. The normal triglyceride level was 71.7% and for cholesterol 65.1%, with low levels 4.3% for triglycerides and 4.7% for cholesterol which can be a sign of infectious pathology (severe tuberculosis) and high values 23.9% for triglyceridemia and 27.3% for cholesterol which is a sign of dyslipidemia and cardiovascular risks. Normal lipid levels are lower than those of the inclusion patients with 72.2% for cholesterol and 65.1% for triglycerides with elevated levels of 1.7% for cholesterol and 30.2% for triglycerides much higher than that of Dene who found 10.0% of cases this elevation is related to treatment [9].

4. Conclusion

The study was based on the determination of the biochemical profile of people living with HIV under monitoring at the National Institute of Public Health Research. At the end of this study, we can say that the parameters analyzed are affected either by intelligence or by gender requiring follow-up.

Acknowledgement

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