

# Lipid Profile in HIV Patients with Stroke at Loandjili General Hospital in Pointe-Noire (Congo)

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**Abstract:** *Introduction:* The objective of our study was to determine the lipid profile of HIV patients who have had a stroke at Loandjili General Hospital in Pointe-Noire. *Methodology:* This was a descriptive cross-sectional study based on a hospital series of 100 patients from January 1 to July 31, 2019 in the Neurology Department of Loandjili General Hospital in Pointe-Noire. The study population consisted of patients living with HIV who had a stroke confirmed by brain scan. The biological investigation consisted of looking for variations in serum levels of the following biological parameters: CT, LDL, HDL, TG. The database was made from the 2010 version of Microsoft Excel. *Results:* We included 100 patients living with HIV (PLHIV), 56% of whom were women with a sex ratio of 0.78. The risk factors were found: hypertension 83%, diabetes 10% and tobacco 2%. The mean age was 56.92±11.21. The mean value of the lipid profile of the study population was: Total cholesterol 1.9±0.54, HDL-cholesterol 0.47±0.29, LDL-cholesterol 1.19±0.48 and Triglycerides 0.99±0.42. *Conclusion:* The lipid profile of HIV patients who have had a stroke remains very disturbed with an increase in the atherogenic risk.

**Keywords:** Lipid Profile, HIV, Stroke, Pointe-Noire, Congo

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## 1. Introduction

Epidemiological data on cerebrovascular diseases in people living with HIV / AIDS differ according to the type of population (industrialized countries versus sub-Saharan Africa) but also according to the period of the study (before or after the introduction of antiretroviral treatments) [1]. Studies on stroke-HIV comorbidity indicate that HIV infection and particularly the AIDS stage appear to be associated with a high risk of stroke in the West [1-3]. There are also African data demonstrating this correlation [1, 4, 5]. These studies have noted a predominance of ischemic stroke ranging from 91-96%. [3-6]. They also report that traditional

risk factors such as: arterial hypertension, diabetes, hyperlipidemia usually found in the general population are almost non-existent in people living with HIV / AIDS victims of stroke [2, 3].

It is in this context that the objective of our study was to determine the lipid profile of HIV patients who have had a stroke at Loandjili General Hospital in Pointe-Noire.

## 2. Material and Study Method

This was a descriptive cross-sectional study based on a hospital series of 100 patients. This study took place from January 1 to July 31, 2019, a period of 7 months, carried out

in the Neurology Department of Loandjili General Hospital in Pointe-Noire.

The study population consisted of patients living with HIV who had a stroke confirmed by brain scan.

The socio-demographic characteristics of the population taken into account were: age, sex following a clinical survey which sought notions of familial hypertension, diabetes, obesity. The biological investigation consisted of looking for variations in serum levels of the following biological parameters: CT, LDL, HDL, TG.

A 4 ml blood sample was taken from all patients at the bend of the elbow and packaged in an EDTA tube, then analyzed using a multiparametric biochemistry auto-analyzer (HUMA Star 100), from a kit. biochemistry (total cholesterol, HDL, triglyceride), HUMAN®.

The database was made from the 2010 version of Microsoft Excel. Qualitative variables were expressed as frequency and quantitative variables as mean±standard deviation. Fisher's Chi2 Exact test was used for univariate analysis between two variables.

### 3. Result

We included 100 patients living with HIV, 56% of whom were women and 44% were men, ie a sex ration of 0.78. The mean age was 56.92±11.21 with extremes ranging from 30 to 86 years.

Table 1 describes the distribution of patients according to stroke risk factors.

**Table 1.** Risk factors for stroke in patients.

Risk factors for stroke	N	Percent (%)
HTA		
Yes	83	83
No	17	17
Alcohol		
Yes	12	12
No	88	88
Diabetes		
Yes	10	10
No	90	90
Obesity		
Yes	8	8
No	92	92
Tobacco		
Yes	2	2
No	98	98

Table 2 describes the lipid profile of the study population.

**Table 2.** Lipid profile of the study population.

Lipid parameters	N	Percent (%)
Total cholesterol (g/l)		
> 2	39	47
≤ 2	61	53
HDL-cholesterol (g/l)		
< 0,35	35,4	36
≥ 0,35	64,6	64
LDL-cholesterol (g/l)		
> 1,50	20	23
≤ 1,50	80	77

Lipid parameters	N	Percent (%)
Triglyceride (g/l)		
> 1,50	14	18
≤ 1,50	86	82

Table 3 describes the mean value of the lipid profile of the study population.

**Table 3.** Mean value of the lipid profile of the study population.

People HIV	
Lipid profile	Mean ± standard deviation
Total cholesterol	1,9±0,54
HDL-cholesterol	0,47±0,29
LDL-cholesterol	1,19±0,48
Triglyceride	0,99±0,42

### 4. Discussion

In our study, we noted a predominance for the female sex with a sex ratio of 0.78. Nkouakou *et al.*, also report a female predominance with a sex ratio of 1.2 [7]. Studies carried out on stroke in PLWHIV have revealed a predominance of men [4, 5, 8].

The frequency of hypertension in the patients in our study was 83%. The study by Connor *et al* [9] found a frequency of hypertension of 55% in PLHIV. Longo-mbenza *et al* [8], report a frequency of hypertension greater than 100%. Gnonlonfoun *et al* [4], on the other hand, noted a frequency of hypertension of 32.7% in stroke / HIV + patients lower than that reported in our study. The difference in the prevalence of hypertension, observed in different studies, could be explained by the size of the sample and the methodology of the study.

In our study, the relative frequency of diabetes was 10%. Our results are close to those reported by Gnonlonfoun *et al* [4], who noted a prevalence of diabetes mellitus of 11.5% in stroke / HIV + patients. However, Chow *et al* [10] reported the prevalence of diabetes mellitus in stroke / HIV + patients at 22%, with a statistically significant difference (p value < 0.001). The differences observed could be explained by the choice of study methodology.

We noted the frequency of obesity of 8% in our patients. Adjedje [11] reports an obesity frequency of 33.3%, higher than ours. The high frequency of android obesity could be explained by the metabolic syndrome induced by HIV. In association with hypertension, diabetes mellitus, hypoHDL-cholesterolemia and hypertriglyceridemia. It constitutes one of the elements defining the metabolic syndrome [12].

This study highlights quantitative lipid abnormalities in our patients, with in particular an increase in LDL cholesterol, TG and a decrease in HDL-cholesterol. The consequence is an increase in the atherogenicity index (IA) calculated according to the CT / HDL ratio. These results confirm the increased risk of atherogenicity during HIV infection reported by several studies [13-15].

The isolated analysis of these lipid parameters showed the following results:

Serum total cholesterol

In our study, we observed a non-significant difference in total cholesterol. Unlike hypocholesterolemia, which is usually reported [15], in our study we noted hypercholesterolemia.

#### HDL-cholesterol

We have reported a decreased serum HDL cholesterol level in our patients. These results corroborate those reported by several authors [15, 16].

The decrease in HDL in PLHIV is either linked to hypertriglyceridemia or the consequence of a decrease in the synthesis of apoprotein A1, which is the major constituent of HDL-cholesterol [15-17].

#### LDL-cholesterol

High LDL cholesterol is a risk factor for stroke. Our results report elevated serum LDL-cholesterol. These results confirm those reported by Sawadogo et al [14]. Serum LDL cholesterol levels increase with immunosuppression of CD<sup>4+</sup> T cells.

#### Triglyceride

In our study, we noted hypertriglyceridemia which is usually reported in PLWHA [13, 15, 17].

Disturbances in triglyceridemia in HIV-infected individuals may be linked to the effect of various cytokines (interferon alpha (INF- $\alpha$ ), interleukin 1 (IL-1), interleukin 6 (IL-6) and tumor necrosis factor alpha (TNF- $\alpha$ )). INF- $\alpha$  and TNF- $\alpha$  are correlated with hypertriglyceridemia [13, 15, 17].

## 5. Conclusion

In view of the results to which this study has succeeded, it can be deduced that the lipid profile of HIV patients who have made a stroke remains very disturbed with an increase in atherogenic risk including an increase in LDL cholesterol, TG and a decline of HDL-cholesterol. Hyper LDL-cholesterolemia is a risk factor for stroke because serum LDL-cholesterol increases with immunosuppression of CD<sup>4+</sup> T lymphocytes. However a cohort study of multi-year positive HIV patients is needed to study the impact, prevalence and factors associated with the occurrence of stroke in this population, in order to assess the actual share of HIV infection. Compared to conventional vascular risk factors.

## Conflict of Interest

The authors declare that they have no competing interests.

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