



RESEARCH PAPER

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Study of the lipid profile of malnourished people living with HIV monitored at the Notre Dame Apôtres Hospital in Sarh, CHAD

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Abstract

HIV/AIDS remains a major public health problem with a high morbidity and mortality rate. The nutritional status of infected persons is weakened for pathophysiological reasons related to the infection and because PLWHIV often have diets relatively low in energy, protein and other nutrients, which may affect the progression of the infection by weakening the immune system with the advent of opportunistic infections and metabolic abnormalities including dyslipidemias. The objective of the present study is to describe the lipid profile of people living with HIV malnutri followed at the NDA hospital in Sarh, Chad. It was a descriptive and analytical study. The study population consisted of people living with HIV followed up at the NDA hospital in Maïngara, Sarh. The lipid profile was assessed by the lipid balance performed in fasting patients. A total of 34 patients were included in the study. Women were predominant (74%). The average age was 43 ± 5 years. Total hypercholesterolemia was observed in 06 patients (17.65%), LDL hypercholesterolemia in 01 patient (2.94%) with pathological LDL hypocholesterolemia observed in 25 patients (73.53%), HDL hypocholesterolemia in 68 patients (27.87%) and hypertriglyceridemia in 44 patients (18.03%). Triglyceridemia to HDL cholesterol ratio was high in 05 patients (14.70%). Malnutrition was associated with dyslipidemia. The lipid profile of HIV infected patients in the present study is characterized by the presence of dyslipidemias promoted by malnutrition.

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Introduction

Providing enough food and good nutrition to meet people's basic needs for health, growth and development has always been a challenge for African countries (Piwoz and Preble, 2001). The challenge has become even greater with the emergence of HIV/AIDS. HIV/AIDS remains a major public health problem with nearly 38 million people infected worldwide and 4.9 million infected in Central and West Africa, according to the UNAIDS 2019 report. The epidemic has markedly increased morbidity and mortality among infants, children and adults. HIV contributes to malnutrition for pathophysiological reasons related to the infection itself and because people with HIV/AIDS often have diets low in energy nutrients, proteins, vitamins and other nutrients (Piwoz and Preble, 2001). HIV weakens the nutritional status of those infected and, in turn, poor nutritional status can affect the progression of the infection by weakening the immune system. The nutritional needs of people living with HIV are greater because their bodies have to work harder to cope with a chronic viral infection and fight opportunistic infections in order to maintain a constant weight and be less vulnerable to opportunistic diseases. Adequate nutrition allows PHAs on ART to resist HIV infection, maintain their weight and improve their quality of life. However, despite the beneficial effects of ART, HIV infection is increasingly marked by the frequency of metabolic abnormalities, including dyslipidemias characterized by increased total cholesterol, LDL cholesterol, triglyceridemia, and decreased HDL cholesterol. The aim of our study is to describe the lipid profile of malnourished people living with HIV followed at the Notre Dame des Apôtres Hospital in Sarh, Chad, in order to propose alternatives to combat possible dyslipidemia depending on the etiology of malnutrition. The present study took place in the Commune of Sarh, Department of Barh-kôh, Region of Moyen-Chari, health district of Sarh and precisely at the Notre Dame des Apôtres Hospital of Maïngara. This hospital is located in the South-West of the commune of Sarh, of religious confession, created on February 24, 2004 and is non-profit. It is entirely

managed by the Sisters of Our Lady of the Apostles of Sarh but under the supervision of the Health District of Sarh. Its objective at the time of its creation was to welcome people living with HIV/AIDS but now Maïngara has opened its doors to all the sick: malnourished children, motherless children, abandoned children and adults etc., whatever their religion, ethnicity or nationality. It has an administration, a health centre, a pharmacy, a well-equipped biomedical laboratory, an operating theatre, a maternity ward, a clinic, a medical imaging department (X-ray and ultrasound), a psychiatry department, a paediatrics department, a nutrition department, a consultation department, and a PLWHA department, which is the precise location of this study. The analysis of biochemical parameters was done in the laboratory of biomembrane and cell signalling of the department of animal physiology of the Faculty of Science and Technology at the University of Abomey-Calavi

This is a descriptive and analytical study that took place over three months on malnourished PLWHA admitted to the NDA hospital of Maïngara in Sarh. The study population is made up of individuals of both sexes aged at least 18 years, HIV-infected, monitored (on ARV) and living in the study town. Their virological status was pre-established at the time of their admission to the centre and was subsequently confirmed at the time of their inclusion in our study. Our study included PLWH aged 18 years and older, with deficiency malnutrition (undernutrition defined as a BMI less than 18.40 kg/m²). Patients who were hospitalized, on hypolipidemics or under 18 years of age were excluded from our study, as were those with associated pathology, those who had violated the protocol and pregnant women. Other categories of patients were excluded: those who refused to participate or withdrew voluntarily; and finally we have those excluded by physician decision for reasons of safety and/or patient welfare.

In our study, we selected 34 adult PLHIV who responded favorably to the study. The data collected

were the blood samples of PLWHIV admitted to NDAM hospital and meeting the selection criteria. The different variables of the study were: age, sex and biological examinations such as triglycerides, HDL and LDL cholesterol and total cholesterol.

Materials and methods

Blood collection and processing of blood samples

Blood collection was performed according to the experimental protocol used by WHO. Blood was collected from all study participants in dry, empty tubes using the vacutainer system. The blood was collected in the biomedical analysis laboratory of the Notre Dame des Apôtres Hospital in Maïngara Sarh and analyzed in the laboratory of pharmacology and improved traditional medicines. Then the blood tubes were left to sediment at room temperature and then centrifuged at 3000 rpm for 5 minutes. After centrifugation the sera and plasma are aliquoted into sterile micro tubes under a laminar flow hood. They are then stored at -08°C until use.

Biochemical parameters

Dosing apparatus

Biochemical parameters were determined using a spectrophotometer following standard procedures and reference values with internal quality control. Operating procedure for biochemical parameters
Samples recovered from the refrigerator were left at room temperature and then an appropriate amount of each mixture was pipetted into the cryotubes. The latter were finally placed in the spectrophotometer for analysis in the case of triglycerides and total cholesterol. For HDL cholesterol, the first step was to centrifuge for 15 minutes at 3500-4000 RPM before reading in the spectrophotometer. After analysis the instrument displays the results on a screen. The displayed results are read, calculated to find the concentrations which are then printed. LDL cholesterol was calculated using total and HDL cholesterol.

Ethical consideration

Authorization was obtained from the Director of the Notre Dame des Apôtres Hospital, the head of the

outpatient treatment service for HIV-infected persons and the President of the persons living with HIV followed in the centre. Written or oral consent was obtained from the patients. The anonymity and confidentiality of the results were respected. Samples for the lipid profile are usually taken at the control of HIV-infected patients. Patients were informed of the study procedures.

Results

From the analysis of Fig. 1, it is clear that 74% of the patients were female and 26% were male. The sex ratio was 0.35.

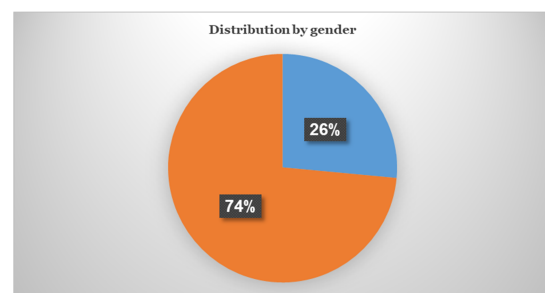


Fig. 1. Gender distribution of patients

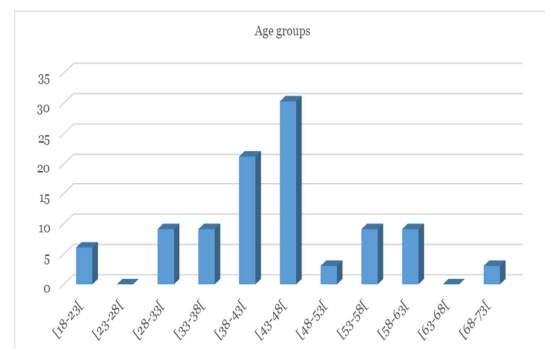


Fig. 2. Distribution of patients by age group

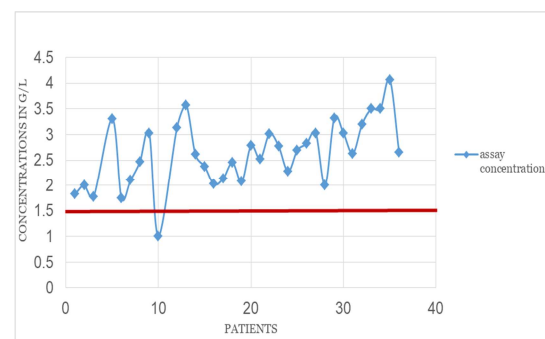


Fig. 3. Triglyceride concentrations

It was found that patients in the age group of [38-48] years were more represented with a percentage of 51.51% (Fig. 2).

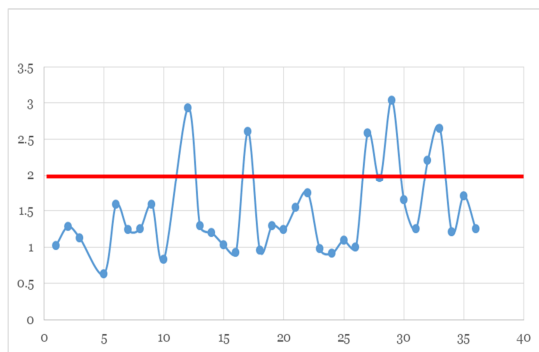


Fig. 4. Total cholesterol concentration

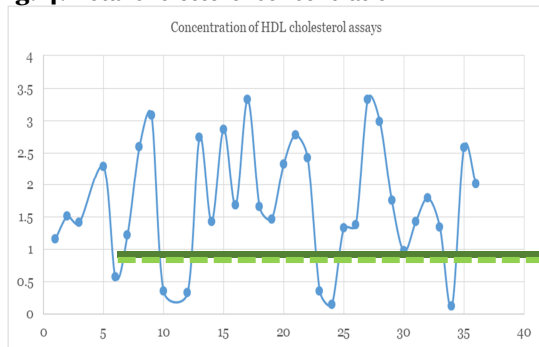


Fig. 5. HDL cholesterol concentration

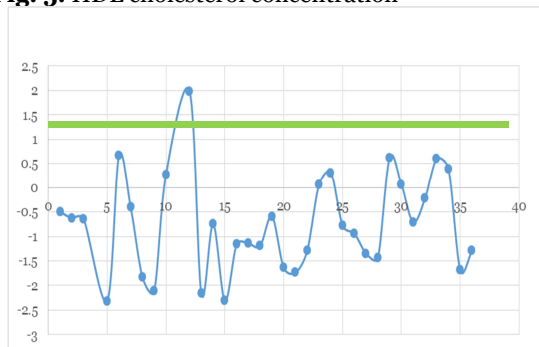


Fig. 6. LDL cholesterol concentration

The analysis of this figure notes hypertriglyceridemia in the majority of patients with a percentage of 97.06% represented (Fig. 3).

Six (06) patients had total hypercholesterolemia, a percentage of 17.65% (Fig. 4).

Five (05) patients (14.70%) had HDL hypocholesterolemia, with 01 male over 04 females (Fig. 5).

Analysis of this figure notes LDL hypercholesterolemia observed in one (01) patient (2.94%) and pathological LDL hypocholesterolemia observed in 25 patients (73.53%) (Fig. 6).

Four (04) patients had a ratio of Triglyceridemia to HDL cholesterol greater than or equal to 5; that is, a rate of 11.76% (Fig. 7).

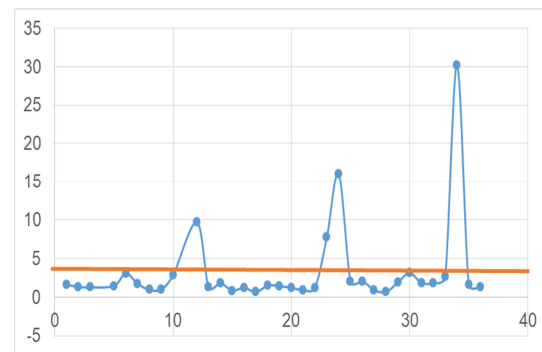


Fig. 7. Triglyceride to HDL cholesterol ratio

Discussion

Our study aims to describe the lipid profile of malnourished people living with HIV on ARVs, in order to propose alternatives to combat possible dyslipidemia depending on the etiology of malnutrition. A total of 34 patients were included in the present study, with a female predominance of 74%. This female predominance of the population was found in the studies conducted by Adébayo *et al.* (2016) and Zhou *et al.* (2015) with percentages of 73.36% and 74.01% respectively. The most represented age group was (43 ± 5 years) or 51.51%. This age range was confirmed by the studies of Shen *et al.* (2015) and Lozès *et al.* (2012) who reported similar results with an average age of 36.34 and 38 years respectively. The lipid profile of the patients is characterized by the presence of dyslipidemias. Total hypercholesterolemia was observed in 17.65% of the patients, showing a low prevalence in the present study compared to studies conducted by Abebe *et al.* (2014) and Adébayo *et al.* (2016) with 42.1% and 41.39% respectively. There was also a low prevalence of LDL hypercholesterolemia observed in 2.94% of patients (with pathological LDL hypocholesterolemia in 73.53% related to undernutrition), in contrast to the studies by Hejazi *et al.* (2013) and de Limas *et al.* (2014) for which LDL hypercholesterolemia was observed in 35.1% and 33.1% respectively. The HDL hypocholesterolemia observed in 14.70% of patients in our study is confirmed by the results of Nsagha *et al.* (2015) and Bekolo *et al.* (2014) studies with a low prevalence of 14% and 18.4% respectively. Hypertriglyceridemia was observed in 97.06% of patients. This prevalence observed in our study is contrary to that observed during the work of Nsagha *et al.* (2015), with a low prevalence of

hypertriglyceridemia; in his study only 1 in 5 patients (20.4%) have hypertriglyceridemia. The high triglyceride to HDL cholesterol ratio which characterizes high atherogenicity risk is observed in 11.76% of the patients which is similar to that of 17.9% reported by Daniyam *et al.* (2013).

The lipid profile of infected patients under antiretroviral treatment in the present study is characterized by the presence of dyslipidemia. The fight against malnutrition will help prevent dyslipidemia and cardiovascular disease.

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