Original Article

Nutritional status of HIV-positive individuals on free HAART treatment in a developing nation

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Abstract

Introduction: HIV positive individuals are prone to malnutrition due to inadequate dietary intake. Additionally, in low-income countries, including Nigeria, stigmatization and discrimination result in a lack of support for HIV-positive individuals ultimately contributing to even further reduced food availability and inadequate dietary intake. This study aimed to determine the nutrirional status of HIV-positive individuals on free, highly active antiretroviral therapy (HAART) in Abakaliki, southeast Nigeria.

Methodology: Subjective global assessment (SGA) technique was used to survey the nutritional status of 120 HIV-positive individuals and a control group over a one-year period.

Results: All the HIV-positive individuals and their control group were physically active, with a third of them belonging to the lower socioeconomic status. There were significantly more malnourished individuals among the HIV-positive group than in the control group ($P < 0.05$).

Conclusion: Malnutrition is common among HIV-positive patients in southeast Nigeria.

Key words: HIV; free HAART; nutritional status; Nigeria

J Infect Dev Ctries 2010; 4(11):745-749.

(Received 25 January 2010 – Accepted 17 August 2010)

Introduction

HIV-positive individuals are prone to malnutrition due to inadequate dietary intake, nutritional losses, metabolic changes, and increased requirements for both macro- and micro-nutrients [1,2]. The critical role of nutritional support and highly active antiretroviral therapy (HAART) in the survival of HIV-infected individuals is well known [3,4]. High-income countries of the world recommend nutritional support as a part of the care provided to HIV-positive individual [5]. In Africa and other low-income countries including Nigeria, there is lack of support for HIV-positive individuals as a result of stigmatization and discrimination [6], ultimately contributing to reduced food availability and inadequate dietary intake for these patients. Increasing health-care costs for laboratory investigations and antiretroviral drugs further worsen the socioeconomic status of the affected family resulting in more poverty.

The benefits of HAART have been established in high-income countries [7, 8. 9]. Therefore, in a bid to combat the spread of HIV/AIDS in low-income countries, international donor agencies and many high-income countries have scaled up programmes to make anti-retroviral drugs available free of charge for all HIV-positive patients in low-income countries. While this is a step in the right direction, nutrition-related complications, which are a major challenge for HIV-infected patients [10], also need to be addressed.

The goal of this study is to evaluate the nutritional status of HIV-infected individuals in southeast Nigeria who are on free HAART provided by some international donor agencies.

Methodology

A cross-sectional survey was conducted over the course of a year (July 2007-June 2008) at the Federal Medical Centre, Abakaliki, in southeast Nigeria. This tertiary health institution provides clinical services for HIV-positive individuals who receive free HAART provided by international donor agencies and the federal government of Nigeria. Patients must

pay subsidized fees only for basic investigations, such as CD4 count, sputum count for acid-fast bacilli, chest X ray, *etc*.

The study group included confirmed HIV-infected males and females on HAART who were attending the HIV clinic of the hospital. All HIV positive patients who met the criteria to receive HAART were included in the study, irrespective of the duration they had been on the drugs. The same types of HAART were used except in cases of resistance or patients with severe anaemia, when some of the drugs were changed accordingly. Those who declined to participate in the study or who showed features of AIDS were excluded from the study. The control subjects were age-matched males and females attending the "well clinic" (for family planning, pre-employment medical examination, screening for metabolic diseases and cancers) who were without medical problems at the time of the study. However, those found to have chronic medical diseases were excluded from the study. All the patients gave consent and the study was approved by the institution's ethics committee.

Data were collected with a questionnaire which was administered by one of the authors (INA), who also conducted nutrition-related physical examinations. The first part of the questionnaire contained information on socio-demographic characteristics. In the second part, the assessor used the subjective global assessment questionnaire [11] to guide and gather information on weight changes; dietary intake (including frequency of eating, rating of appetite, feeding or eating problems, diet restrictions); frequency and duration of gastrointestinal symptoms (loss of appetite, vomiting, diarrhea and constipation); and functional capacity (including level of activities such as work attendance, ability to run or engage in sports, *etc.*). A nutrition-related physical examination was performed, looking at specific sites on the body for signs of fat and muscle wasting as well as edema. On the basis of all these parameters' ratings, the assessor assigned an overall subjective global rating of well nourished (A), moderately malnourished (B), or severely malnourished (C) which corresponded to the assessor's subjective opinion of the patient's nutritional status. Subjective global assessment (SGA) has been validated in HIV-infected patients [12].

The sample size was calculated using the formula $n = Z^2 Pq / d^2$ where n = sample size, Z = coefficient of Z statistics obtained from a standard normal distribution table, P = prevalence, q = 100-P and d = sampling error with a confidence limit of 5%. Using a prevalence rate of 5% from a previous study [13], the calculated minimum sample size was 73. Statistical analyses were performed using frequencies, mean ± SD and Chi Square as appropriate at a 95% confidence interval level with the statistical package for social science (SPSS, Chicago, USA) computer software version 13.0.

Results

According to inclusion criteria, a total of 120 HIV-infected individuals (study group) with the mean age of 29.4 ± 7.5 (range 20 to 46) years were included in the study whereas sixty-nine (69) HIV-positive patients who did not meet the criteria to be placed on HAART and another eleven (11) patients with full-blown AIDS were not included in the study. One hundred and twenty healthy individuals with the mean age of 26.3 ± 7.8 (range 20 to 43) years completed this study. The study group was HIV-positive for four to 84 months (mean 15 ± 11.6). All the HIV-positive individuals were still physically active: 45% (n = 54) were government employed; 24% (n=29) were self-employed; 19% (n = 23) were unemployed; and 12% (n = 14) were either attending school or engaged in skill acquisition. The HIV-positive patients used 4.3 ± 1.1 (range 0.4-12) percent of their monthly incomes paying for the subsidized laboratory investigations.

Table 1 shows the socio-demographic characteristics of the HIV positive individuals and their control group. In comparison with the control group, the HIV-positive group had more divorced/separated and widowed/widower individuals than the HIV-negative group (Table 1). As Table 2 shows, there were significantly more malnourished individuals in the HIV-positive group than in the control group ($P < 0.05$).

Table 1. Sociodemographic Characteristics of the HIV Positive Individuals and their Control

Parameters	**HIV Positive**		**Control**		**P value[a]**
	NO.	**(%)**	**NO.**	**(%)**	
Age (mean) years	**29.4**		**26.4**		
Marital status:					
Single	29	(24.2)	21	(17.5)	
Married	64	(33.3)	93	(77.5)	
Widowed	15	(12.5)	4	(3.3)	
Divorced/Separated	12	(10.0)	2	(1.7)	0.0002
Educational Status:					
None	4	(3.3)	3	(2.5)	
Primary	30	(25)	19	(15.8)	
Secondary	60	(50)	64	(53.3)	
Tertiary	26	(21.7)	34	(28.3)	0.2830
Social Class: [22]					
I	10	(8.3)	15	(12.5)	
II	28	(23.3)	36	(30.0)	
III	40	(33.3)	27	(22.5)	
IV	30	(25.0)	26	(21.7)	
V	12	(10.0)	16	(13.3)	0.2505

$P < 0.05$ is significant
a: using the X^2 test

Table 2. Prevalence of Malnutrition in the HIV Positive individuals and the Control using SGA

State of Nutrition	**HIV Positive (n=120)**		**Control (n=120)**	
	NO.	**(%)**	**NO.**	**(%)**
Well nourished	11	(9.2)	102	(85)
Mild-moderate malnutrition	70	(58.3)	18	(15)
Severe malnutrition	39	(32.5)	0	(0)

$P < 0.0001$
Using the X^2 test

Discussion

This study, which evaluated HIV infected patients with no clinical signs of AIDS, found that majority of them had some degree of malnutrition. Malnutrition, which is often seen at an advanced stage of HIV-infection, was a prominent feature in the early stages of HIV infection because of the poor nutritional status of a significant percentage of individuals in our environment. In general, the nutritional status of the normal Nigerian population is lower compared to that of other countries. For example, a previous study states that in Nigeria, 14% of normal females and 15% of males are underweight [14], which contrasts the situation in Brazil, where 4.8% (men) and 11.7% (women) were found to be obese [15]. The inability of individual HIV-infected patients to meet the daily recommended dietary allowance is more likely due to socioeconomic

factors. More than a third of the HIV-infected patients in this study belonged to the lower socioeconomic status, a group classified as "food insecure," which is defined as not having access at all times to enough food for an active and healthy lifestyle [16]. Furthermore, families affected by HIV experience the death of partner, divorce or separation [17] and increased household expenses due to increased health costs incurred by laboratory tests that they must pay for themselves [18]. The end result is more poverty and more food insecurity. Unfortunately, these conditions may continue for some time as international donor agencies such as the US Presidential Emergency Program for AIDS Relief (PEPFAR) and AIDS Relief place more emphasis on the treatment of HIV with potent antiretroviral therapy [7] rather than on providing food supplements in addition to antiretroviral drugs to the detriment of the nutritional status of the HIV patients [19]. World Health Organization (WHO) nutritional recommendations for HIV-infected individuals emphasize the critical role of adequate nutrition for the health and survival of all subjects regardless of their HIV stage [2].

The SGA used in this study to evaluate nutritional status of HIV-infected individuals is an easy-to-learn and simple-to-implement procedure that requires no additional laboratory testing. This method has been used to evaluate the nutritional status of HIV- infected patients, whose poor nutritional status according to SGA tend to correlate with lower body mass index [19]. The limitation of this cross-sectional study includes the fact that it cannot provide information on the effects of nutritional status on the outcome of HIV-infected individuals. A controlled clinical trial which is already underway will answer this question.

In conclusion, malnutrition is common among HIV-infected patients in Nigeria. Nutritional status has been shown to predict survival rate in adult with HIV after adjusting for CD4 count and other secondary events [20]. Therefore, while governments in low-income countries should be encouraged to eradicate extreme poverty and ensure food security for its populace, including HIV-infected individuals, high-income countries and international donor agencies should consider providing food supplements in addition to antiretroviral drugs to these vulnerable HIV-positive individuals in developing countries. Optimal nutrition no doubt helps boost immune function and maximize the effectiveness of antiretroviral therapy.

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Conflict of interests: No conflict of interests is declared.