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ABSTRACT

***Background*: Nutrition and HIV are strongly related and any immune impairment as a result of HIV leads to malnutrition while malnutrition leads to immune impairment and thus worsens the effect of HIV. Individuals living with HIV have special nutritional needs irrespective of whether they are on anti-retroviral treatment or receiving care services.**
***Objective*: To establish nutritional status of adult male on ART at Kericho District Hospital, Kenya.**
***Design*: Cross sectional analytical study.**
***Setting*: HIV clinic at Kericho District Hospital, Kenya.**
***Subjects*: HIV positive adult male patients**
***Results*: Body Mass Index ≥18.5 and ≤ 24.5 (70.92), >16 & < 18.5 (11.94), >25.5 and < 30 (11.94), ≤ 16 (2.58) and ≥30.**
***Conclusion*: There is a high burden of malnutrition among PLHIV on ART (29.1%). Nutritional assessment, Counseling and support (NACS) should be the key intervention during the course of chronic HIV care and follow up.**

INTRODUCTION

Nutrition and HIV are strongly related to each other (1). Human Immunodeficiency Virus (HIV) is a severely infectious and fast replicating retro-virus which impairs and deteriorates the functioning of the immune system's cell (2). Malnutrition leads to immune impairment, consequently worsening the effects of HIV, and contributes to a more rapid progression of HIV disease (3).

About 50% of the Kenyan households are food insecure due to poverty and inadequate food production. The resulting nutrition insecurity is exacerbated by a large burden of morbidity. In the adult population, anecdotal evidence indicates significant rates of under nutrition with the dry plains reporting over 20% among rural population groups (4).

The scientific evidence indicates that poor nutrient status in HIV-infected individuals worsens their immune and therefore renders the patients vulnerable to infections and further deterioration in the patients body nutrient intake and utilisation (2). HIV infection increases energy requirements through increases in resting energy expenditure (REE 12% higher), while reduced food intake, nutrient mal-absorption, negative nitrogen balance and metabolic alterations exacerbate weight loss and wasting, perpetuating the cycle(2).

Changes in metabolism in HIV-infected people occur as a result of the immune system's response to HIV infection. When the body mounts its acute phase response to infection, it releases pro-oxidant cytokines and other oxygen-reactive species. These cytokines produce several results, including anorexia (causing lower intake of food) and fever (increasing energy requirements). If the infection is prolonged, muscle wasting occurs because muscle tissue is broken down to provide the amino acids with the immune protein and enzymes they need(3).

Gastrointestinal problems are frequent in persons infected with HIV and also among those receiving HAART. Diarrhoea is very common, and malabsorption continues to be found in HIV infected persons with or without chronic diarrhoea (5).
According to the 2005-2010 Kenya National HIV / AIDS strategic plan, the Government of Kenya identified good nutrition as a key component of the national response to the HIV / AIDS epidemic, this in keeping with the global recognition that nutrition is essential for the promotion of health and quality of life for HIV infected patients (Ministry of Health, Government of Kenya, 2007). Nutrition assessment (anthropometric, biochemical, clinical and dietary) is a prerequisite for the provision of good nutritional care among HIV positive patients. Nutrition assessment refers to the

process of determining a person's nutritional status situation, and vulnerability to malnutrition though measurements of anthropometric and biochemical assessments including the physical examination for clinical signs. The results from screening and assessment inform the plan for nutrition intervention, which is usually done at the time of diagnosis and throughout treatment process (6). While nutritional management is considered as a vital part of the ART program effectiveness, in Kenya in general and in Kericho in particular, studies on nutritional status of PLHIV are limited. This study was important in that it was able to establish the nutritional status of adult male living with HIV and already initiated ART.

MATERIALS AND METHODS

Weight was measured for all the study participants using the SECA 704 medical Weighing scale. Calibration occurred at the beginning and end of each examining day. Participants were asked to remove their heavy outer garments and shoes. The participant stood in the centre of the platform; weight distributed evenly to both feet. The weight was recorded to the resolution of the scale (nearest 0.1 kg). Height was measured for all the study participants using the SECA 213 height metre. At the beginning and end of each examination day, the height meter was checked with standardised rods and corrected when the error was noticed. Participants were asked to remove their shoes, heavy outer garments, and hair ornaments. The participant was asked to stand with his/her back to the height rule. The back of the head, back, buttocks, calves and heels should be touching the upright, feet together. The top of the external auditory meatus (ear canal) was in line with the inferior margin of the bony orbit (cheek bone). The participant was asked to look straight. Height was recorded to the resolution of the height rule. Data were checked, coded, and entered to stata version 11.0 statistical packages for windows, and analysis was made. Data entry was managed by the principal investigator .Significance was assessed at 95 % confidence level. In this study, weight and height was assessed and the body mass index (BMI) described according to WHO (2004) principled cut off points .Anthropometric data analysis involved calculation of body mass index and categorisation of the BMI as per the WHO 2004 principal cut off points for adults with diplay of classification in the category using the proportions.

Prior to data collection the ethical approval was obtained from the ethical review committee of Kenyatta University. The research permit was issued by the National commission for Science, Technology and Innovation (NACOSTI). The permission to conduct this study was further obtained from Kericho District Hospital ethical review committee.

RESULTS

Nutritional status of the HIV positive adult male receiving HAART : The prevalence of the overall malnutrition is 29.1% with mild under nutrition (11.9%), overweight (11.9%), severe acute malnutrition (2.58%) and obesity (2.58%) as defined by defined by WHOM 2004 principal cut off points using (Table 1). The results show that 70.92% of the participants had BMI within the normal nutritional status as. The proportion with moderate under nutrition was similar with those presenting with overweight while the proportion with severe acute malnutrition without complications was similar with those presenting with obesity suggesting that while food security is still a challenge among HIV positive patients, the metabolic related complication are present with a significant proportion.

Table 1
Classification of Nutritional status by Body Mass Index (BMI)

*Principal cut-off points of BMI kg/m^2	Classification of Nutritional Status	Proportion in Percentage (%)
≤ 16	Severe acute malnutrition	2.58
>16 & < 18.5	Moderate acute malnutrition	11.94
≥18.5 and ≤ 24.5	Normal Nutritional status by BMI	70.92
>25.5 and < 30	Overweight	11.94
≥30	Obese	2.58

* Adapted from WHO, 2004

DISCUSSION

Inadequate nutrition has been identified as a major health concern in the care of People Living with Human Immunodeficiency Virus (PLHIV) in Kenya and which compromises effectiveness of Antiretroviral Treatment (ART). A study in Malawi showed that, the prevalence of malnutrition among patients receiving home-based care was 50% (7) which is higher than the result of this study. The difference could be due to the enrollment of home based care patients who had no means to feed themselves, (50% could not support themselves in the Malawi study as compared to the present study where the eligible clients are enrolled to outpatient therapeutic program for the moderate malnutrition which is basically dependent on disclosure of HIV status.

The prevalence of malnutrition in general in the present study is almost similar with a study done in Ethiopia (8) which documented the prevalence of malnutrition at 27.8%. Measuring nutritional status among PLHIV is an essential part of the ART program. It involves the assessment of risk in HIV/AIDS positive persons, estimating percentage of body weight loss and Body Mass Index (BMI

The observation from this study agrees with Previously published study in AIDS Journal which documented that nutrition intervention should not only focused on management and treatment of wasting among PLHIV but should also take into consideration the metabolic changes related to the use on antiretroviral (9).

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