

EFFECT OF HIGHLY ACTIVE ANTI RETROVIRAL THERAPY ON BMI IN PLWHAS

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ABSTRACT

As Highly active antiretroviral therapy (HAART) intervention scale up in resource-limited settings, addressing food and nutrition implications becomes a critical component of care and support programs.

HIV patients attending the Community Health and Primary Care (CMPC) clinic of the Olabisi Onabanjo Teaching Hospital, Sagamu, were given triple combination therapy of ARV medications free of charge from July 2002 to Nov 2003. The medications were salvaged from clients who no longer needed them in Cornell University Medical College, New York. The weights, height, and information on their socioeconomic status and other relevant data were recorded during the 12-month follow up visits.

A total of 100 people living with HIV/AIDS (PLWHA) was studied. 55% females attended the clinic. The mean age of the clients was 36.1 +/- 11.54. Sixty nine percent (69%) of the patients had a maximum of secondary school education and they were mainly traders in the low socio economic class. 53 (53%) attended the clinic regularly. The body mass index of those who attended the clinic regularly was 20.14 +/- 3.2 on admission. This significantly increased to 23.9 +/- 4.2 (P = 0.0000) after 12 months of treatment. Sixteen of the clients gained between 1-5kg weight while, sixteen gained between 1-10kg, and twenty gained more than 10kg within 12 months of follow up. The mean weight gain was 10.1kg and the range of weight gained was 1-34kg. The clients that gained more than 15kg were

on protease inhibitor medication. Fourteen (14%) of the patients died during therapy. The cause of death in seven was dehydration secondary to diarrhea while the cause of death in the remaining seven was unknown.

More females attended the clinic. The body mass index and the well being of the clients improved on therapy. The death was due to HIV related illnesses and none were due to complications of the drug therapy. The clients on protease inhibitor medication gained more weight when compared to those who were on NNRTI and NRTI medication. Nutrition care and support should be part of the comprehensive care package of PLWHAS to maintain nutritional status and manage outcome of ARV and food interaction.

Keywords: PLWHAs, HAART, Nutritional Status, Body mass index

INTRODUCTION

HIV infection leads to many nutritional problems. For a long time the wasting syndrome was one of the most frequent inaugural features of AIDS and still concerns many patients. The weight loss worsens the prognosis of the disease¹. Karlson and Nordson showed that the lower the BMI, the worse the nutritional status and the worse the general state of health. BMI is a strong indicator of the measure of nutritional status and has been in use for more than 20 years. It is a measure of weight in kilograms divided by height in metres squared. Nutritional check ups and prevention of wasting in HIV/AIDS patients is very important in the management of these patients¹. The

greater energy expenditure when resting further highlights the need for nutritional follow up in the management of the PLWHA². Recent study has shown that it is vital to optimize the calorific intake of HIV- infected patients presenting with chronic diarrhoea before the onset of severe immune deficiency². In this way the severe immune deficiency which leads to wasting can be prevented².

The management of HIV infection has greatly improved during recent years essentially because of the appearance of new antiretroviral drugs. Highly active antiretroviral therapy has achieved important reductions of viraemia and significant improvement of CD4(+) cell counts in HIV infected patients. The adverse effect of these antiretroviral drugs on the nutritional status and the patient's compliance towards their treatments also require attention.

ARVs can interact with food and nutrition in a variety of ways, resulting in both positive and negative outcomes³. Because different ARVs interact with food and nutrition differently, it is critical to understand the specific nutritional interactions and implications of the particular ARV being taken. This understanding enables effective management of these interactions to maintain nutritional status and to improve drug efficacy, tolerance, safety, and adherence³.

Lipodystrophy, whose etiology is still unknown is a common feature in PLWHAs receiving anti retroviral drugs⁴. Metabolic disorders such as dyslipidemia, glucose intolerance, diabetes, among others, in

this chronic disease require particular attention since they increase cardiovascular risks.

This study aims to document the effect of antiretroviral management on basal metabolic index as a measure of nutritional status and to help care providers see the need to incorporate food and nutrition counseling in the health care package of people living with HIV/AIDS (PLWHAs) receiving HAART.

MATERIALS AND METHOD

Free antiretroviral medication programme for PLWHAs started in July 2000 at the Centre for Special Studies (CSS), Sagamu. The centre is currently located at the infectious disease clinic of the Department of Community Medicine and Primary Care of Olabisi Onabanjo University Teaching Hospital Sagamu. Patients who are HIV positive in the community come to the clinic by referrals from self, physicians, friends, families, other health workers and institutions. All patients are then re-screened to confirm HIV status at the centre before full admission.

Anthropometric measurements and other relevant information were recorded at each clinic visit.

Initial clinic visits

At the initial clinic visit HIV pre-test and post test counseling were done before the patient was admitted to the study. The patient also sees a physician who determines the clinical stage of the disease.

Criteria for antiretroviral drug initiation

Initial admission criteria was first come first served basis but subsequently was based on a CD4 count of less than 200mm^3 and or symptomatic disease and availability of medication. HIV RNA load (Viral load) was not available in the study

centre.

Antiretroviral medication

Patients were managed with combination of at least 3 antiretroviral drugs from 2 of the 3 groups of antiretroviral drug which are the Nucleoside Reverse Transcriptase Inhibitors (NRTI), the Non Nucleoside Reverse Transcriptase Inhibitors (NNRTI) and the Protease Inhibitors. (PI)

Two arms of drugs were given to the patients thus

ARM 1 = 1 PI + 2 NRTI OR

ARM 2 = 1 NNRTI + 2 NRTI

Except otherwise indicated one month's supply of drugs was given to the patients per visit.

Follow up

After the initiation of antiretroviral medication, patients were seen every 2 weeks for the first month to see any adverse drug reaction. Afterwards patients were followed up in the clinic every 4 weeks for 12 months. Patients were recruited and followed up with treatment between August 2002 and December 2003.

RESULTS

A total of 100 PLWHAs that attended the clinic was studied. Eighty five (85%) of the patients were from the Yoruba ethnic group and fifteen (15%) from the Ibo ethnic group. Ninety one (91%) of them were HIV I seropositive while two (2%) was HIV II seropositive and seven (7%) were HIV I and II seropositive. There were fifty seven females (57%) and forty three males (43%). The mean age of the clients was 36.1 ± 11.54 . Eighty three (83%) patients attending the clinic were Christians, sixteen (16%) were Muslims and One (1%) was a traditional believer. Over 90% of patients had a maximum of secondary school education and they were mainly farmers, traders or junior civil

servants, while 9% belonged to the middle social economic class. None belonged to the high socio-economic class. The average weight of the patients at attendance before initiation of drug therapy was $52\text{kg} \pm 12.7$. This significantly increased over 12 months of ARV medication to $62.18\text{kg} \pm 16.9$. ($P = 0.0001$) The body mass index of fifty-three PLWHAs who attended the clinic regularly was 20.14 ± 3.2 on admission. This significantly increased to 23.9 ± 4.2 ($P = 0.0000$) after twelve months on medication. Eighty six (86%) patients were alive and well at the end of the study period, twenty six (26%) out of those that are alive and well did not attend the clinic regularly while fourteen (14%) patients died within six to twelve months of follow up. The cause of death in seven patients was dehydration secondary to diarrhoea. The cause of death in the remaining seven patients is unknown. Complaints of itching, body pains, rashes, insomnia, cough and fever were common during therapy.

DISCUSSION

From a relatively unknown disease in the early 1980s, HIV/AIDS, has become a leading health and social problem all over the world. As the epidemic rages, the prevalence rate of HIV infection has increased from 1.8% in 1991 in Nigeria to 5.8% in 2001, translating to 3.47 million people living with HIV/AIDS in Nigeria⁵. The epidemic mainly attacks people in their prime. This is evidenced from the result of this study in which the highest prevalence of those reporting at the clinic falls within the fourth decade of life. Recent estimates indicate that around the world about 7,000 people aged between 15-24 years are newly infected with HIV each day.

The introduction of antiretroviral therapy to PLWHA has greatly improved the management of HIV infection⁶. This is evidenced from this study in which 86% of

the infected patients receiving antiretroviral therapy were alive and well. Most of the patients that died were severely immuno compromised and most died shortly after the commencement of treatment. Most of the death occurred within 3-6 months of treatment, the mortality rate dramatically reducing after this time.

In Africa, AIDS is still known as the slim disease⁷ because of the weight loss associated with the disease. Studies have confirmed that malnutrition with alteration in body cell mass and fat occurs at all stages of HIV infection^{8,9}. Weight loss negatively impacts patient's quality of life and self-image. Antiretroviral drugs reduces the wasting syndrome in some of the patients.. Overall there was an increase in the weight of the patients treated with the antiretroviral therapy with a mean weight gain of 10.1kg. This was not however the case in all the patients treated with the drug. The weight gain ranged between 1kg and 34 kg. Much remains to be understood about the relationships between losses in body mass and HIV infection⁷. Although the highly active antiretroviral therapies have reduced the prevalence of wasting syndrome, they have at the same time been associated with previously unrecognized variations to body composition⁷. ARVs can interact with food

and nutrition in a variety of ways, resulting in both positive and negative outcomes³. This is because different ARVs interact with food and nutrition differently, certain foods affect the efficacy of certain ARVs by affecting their absorption, metabolism, distribution, or excretion. Food enhances the efficacy of some ARVs and inhibits the efficacy of others. For example a high energy, high fat, high protein meal decreases absorption of the PI indinavir¹⁰. A high fat meal increases the bioavailability of tenofovir (a nucleoside)¹¹. It is therefore critical to understand the specific nutritional interactions and implications of the particular drugs being taken. This understanding enables effective management of these interactions to maintain nutritional status and to improve drug efficacy, tolerance, safety, and adherence. Consequently, some ARVs are taken with food, others on an empty stomach, and others with or without specific types of foods. Hence, the need to supplement calories, treat with antiretrovirals and address reversible causes of weight loss, and nutrition counseling are generally beneficial.

More females attended the clinic, which suggests that women are at a higher risk of infection. Ogun et al found a male: female ratio of 1: 2 in 1999 in the same environment. This higher risk is partly a

result of women's greater biological vulnerability to the virus, compounded by social and economic pressures as well as an unequal gender relation that makes it very difficult for women to refuse unwanted sex.. Economic reasons especially poverty accounts for the rising profile of prostitution. This is also corroborated in this study in which the majority of the patients have only the primary and secondary education. This low educational status prevents them from having access to the wealth of the nation. They fall into the low socio economic class and may at one time or the other be engaged in casual sex to get money and gifts in return for sex. Moreover, traditional practices exacerbate women's vulnerability. These practices include wife inheritance, polygamy, and female genital mutilation among others^{5,6}.

CONCLUSION

This study has shown that on the whole there was a significant increase in weight and well being of symptomatic PLWHA on HAART. Nutritional implications for ARVs cannot be generalized since different drugs have different food interactions and PLWHAs have special nutritional needs. Hence individualized nutritional care and support is critical for all PLWHAs.

Table 1 Socio demographic characteristics of clients taking ARV

Characteristics	Frequency	Percentage
Age Group		
0-10	3	3
11-20	3	3
21-30	23	23
31-40	36	36
41-50	25	25
51-60	10	10
Total	100	100
Sex		
Male	45	45
Female	55	55
Total	100	100
HIV status		
HIV 1	91	91
HIV 2	3	3
HIV 1 & 2	6	6
Total	100	100
Educational status		
None	11	11
Primary	32	32
Secondary	46	46
Tertiary	12	12
Total	100	100
Occupation		
Unemployed	7	7
Trading/Farming	59	59
Civil servant	12	12
Driver/taxi driver	8	8
Security guard/Police	5	5
Artisans	9	9
Clergy	1	1
Total	100	100

Table 2 Treatment Outcome

Outcomes	Frequency	Percentages
Dead	14	14
Alive and well	86	53
Total	100	100

$\chi^2 = 103.68$ $P = 0.000$

Table 3

Mean Weight and Body mass index at admission and after one year of treatment.

N = 53

Characteristics	Before treatment	After One year Treatment	P. value
Weight	54.09 +/- 10.17	64.60 +/- 12.99	0.0001
Body mass index	20.1 +/- 3.2	23.9 +/- 4.2	0.0001

Table 4: Frequency of weight gain

Weight n=53	Frequency	Percentage
0-5	18	34.0
6-10	16	30.2
11-15	12	22.6
16-20	1	1.9
21-25	2	3.8
26-30	0	0
31-35	4	7.5
Total	53	100

Mean weight gain = 10.1 kg

$\chi^2 = 57.51$

P-value = 0.0001

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