

DIET CONSUMPTION IN HIV/AIDS PATIENTS STABILIZED ON HIGHLY ACTIVE ANTIRETROVIRAL THERAPY (HAART) AT ART CENTRE OF A TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: HIV/AIDS patients stabilized on antiretroviral therapy have a greater loss of body weight, and therefore need adequate nutrition. The objective of this study was to correlate nutritional status, body weight of patients and CD4 cell count in HIV/AIDS patients stabilized on Highly Active Antiretroviral Therapy (HAART).

Methodology: An observational study was conducted on people living with HIV/AIDS (PLHA), who were registered at ART centre of P.B.M. & associated group of hospitals in Bikaner, Rajasthan (India). The patients under study (n=28) were already stabilized on HAART based on NACO- India. These PLHA were consuming different types of food/diet, the effect of which was under study on ART-induced changes in CD4 cell count and body weight of patients. A food/nutrition assessment form including body weight of patients and scoring system of Healthy Eating Index (HEI) were used to assess the nutritional status of PLHA.

Findings: The study showed insignificant increase ($p > 0.05$) in both CD4 cell count and body weight. The mean HEI score indicates inadequate diet consumption and poor nutritional status in PLHA.

Conclusion: The balanced and healthy diet has positive impact on immune status and body weight of HIV/AIDS patients stabilized on HAART. Our observations underlie the fact that as because the subjects under study were mostly from low socioeconomic group and the low Healthy Eating Index (HEI) score, therefore, further rise of HAART induced CD4 cell count was not found to be significant.

Key words: CD4 cell count, Diet, HAART, HEI, Nutritional-Status, PLHA, Weight

INTRODUCTION

Human immunodeficiency virus (HIV) infection represents a significant global problem. The number of patients with HIV is increasing every year in under-developed countries. The HIV/AIDS epidemic has had a devastating impact on health, nutrition and overall socioeconomic development in people living with HIV/AIDS (PLHA). There is an urgent need for renewed focus on and use of resources for nutrition as a fundamental part of the comprehensive package of care at the country level.^{1,2}

Adequate nutrition is vital for health and survival of all individuals regardless of HIV status, which is attained through consumption of balanced healthy diet. Nutritional status is directly related to the immune status/function of an individual. The human immunity and the risk of opportunistic infections depend on food/nutrition consumed by an individual^{3,4}. Irregular and inadequate nutrition represent an important precipitating factor in increasing number of HIV infected patients^{5,6}. To date, the study regarding effect of diet consumption in HIV/AIDS patients is limited in India. We, therefore, conducted this observational study to observe the HIV status on the basis of CD4 T cell count in subjects, who are consuming different types of food, micronutrients, macronutrients etc.

MATERIAL AND METHODS

Study Design

An observational study was conducted among 28 HIV infected patients receiving HAART between February 2012 to September 2012 in ART centre of P.B.M. and associated group of hospitals, Bikaner, Rajasthan (India) and data collection was over till the completion of six months follow up of all patients in September, 2012. Patients were being treated with NACO supplied antiretroviral drugs, which does not include any protease inhibitor. The treatment strategy for all patients was inclusion of two Nucleoside Reverse Transcriptase Inhibitors and one Non-Nucleoside Reverse Transcriptase Inhibitor. (2 NRTI + 1 NNRTI)⁷

Any one of the following regimens was chosen according to the requirement of the patient and availability of the drugs:-

1. Stavudine (30mg) + Lamivudine (150mg) + Nevirapine (200mg)
2. Stavudine (30mg) + Lamivudine (150mg) + Efavirenz (600mg)
3. Zidovudine(300mg) + Lamivudine (150mg) + Nevirapine (200mg)
4. Zidovudine(300mg) + Lamivudine (150mg) + Efavirenz (600mg)

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Ethical considerations

The study was approved by the Ethical Committee of S.P. Medical College, Bikaner. Each patient was given full information of the study and then written informed consent was obtained from the patients.

Inclusion criteria were as follows: (1) PLHA in Community Care centre in Bikaner and registered with ART Centre at P.B.M. and associated group of hospitals, Bikaner (Rajasthan); (2) HIV- positive patients on stabilized HAART (at least 6 weeks); (3) Ambulatory patients having CD4 cell count >100 cells/mm³; (4) HIV-positive patients between the age of 20 to 50 years; and (5) HIV positive patients able to comprehend study procedures.

Exclusion criteria were as follows: (1) Seriously ill/moribund patients; (2) Addiction or any substance abuse; (3) Any other major illness (TB, Epilepsy, cancer etc.); and (4) Pregnancy.

The nutritional status was observed on the basis of CD4 cell count and body weight. The CD4 cell count was estimated by Partec CyFlow counter flow cytometer.

Data Collection Tools

Food/Nutrition assessment form⁸ and scoring system of Healthy Eating Index (HEI)⁹ were used for data collection. The HEI was used to score the patients food intake. The HEI score is the sum of ten components, each representing the aspect of healthy diet. The HEI was modified for the purpose of the current study. 'Seven' components of the HEI were measured.

Components one to five measured the degree to which the subject's diet conformed to the serving recommendations for the five major food groups i.e. grains, vegetables, fruits, milk & milk products, and egg/meat. Component six measured the total fat consumption as percentage of the total food energy intake and component seven examined variety in a person's diet. Each component of the HEI has a maximum score of ten and a minimum score of zero (on the basis of servings). The maximum overall score for the seven components is '70'. The HEI score above 56 represents 'Good Diet', between 36 and 56 represents a diet that 'needs improvement' and less than 36 represents 'Poor diet'.

Statistical analysis

Means and standard deviation (SD) were calculated for continuous variables. To analyze the nutritional status on the basis of CD4 count and body weight, Paired t-test was employed. The difference between the initial and final CD4 counts and difference between initial and final body weight were analyzed by Paired t-test. The p value of less than 0.05 was considered as statistically significant. All statistical analysis was done by using MSTAT Software.

RESULTS

A total of 28 patients stabilized on HAART were followed up monthly for six months. The mean (\pm SD) increase in CD4 cell count and Body Weight was 80.57 ± 138.57 cells/mm³ and 0.678 ± 2.625 kg respectively. The increase in CD4 count and body weight was insignificant by paired t-test ($p > 0.05$). (Table 1)

Table 1: Biographic characteristics of the Patients (n=28)

Parameter	Mean initial (\pm SD)	Mean final (\pm SD)	Difference	p-value
CD4 cell count (cells/mm ³)	426.11 \pm 219.93	506.67 \pm 223.91	80.57 \pm 138.57	0.18
Body Weight (kg)	55.67 \pm 12.04	56.71 \pm 12.08	0.678 \pm 2.625	0.74

According to HEI scoring system, the mean HEI score of grain consumption was 8.44 (Highest). The total fat score was 5.75 (second highest), vegetable consumption was 2.14, milk and milk products consumption was 2.36, fruit consumption was 0.84, egg/meat consumption was 0.17 (Figure-1).

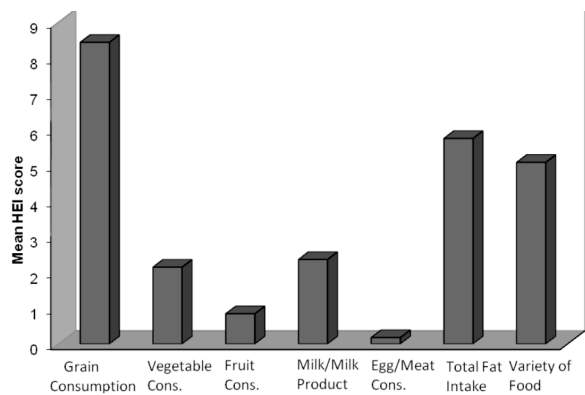


Fig. 1: Healthy Eating Index : Component Mean Scores of the Patients

DISCUSSION

Nutritional status affects the immune system of an individual. Malnutrition impairs the immune system, suppressing immune functions that are fundamental to protect the host efficiently from HIV infection. Malnutrition may potentiate the effects of HIV infection. The presence of malnutrition may interfere with ART treatment which is the bed rock of AIDS management. The mean variety score was 5.08, indicating that the patients did not consume adequate variety of food on a daily basis. The mean score of 27.7 for the patients as a whole indicated that the majority of the patients had a poor HEI and nutritional status was poor.

The result of present study showed insignificant increase in CD4 cell count and body weight. Nutritional status was poor according to food/nutrition assessment form and scoring system of HEI. The mean HEI score in South African study¹⁰ was 28.24 and our study presented HEI score of 27.7. The body weight in both the studies was also found to be insignificantly related to effect of consumption of diet. But in contrast to our study, that showed insignificantly rise in CD4 cell count and South African study showed a statistically significant rise in CD4 cell count¹⁰.

The present study was supported by Williams BS et al¹¹ as they demonstrated the effect of diet consumption on the immune status of people living with HIV/AIDS and observed a direct and positive correlation between nutritional status and survival of HIV patients.

Furthermore, the present study was supported by World Health Organization (WHO) nutritional recommendations for HIV infected individuals that emphasize the critical role of good nutrition for the health and survival of patients regardless of their HIV stage.²

Nutritional status in our study has been shown to predict survival rate in adult with HIV after adjusting for CD4 count and other secondary events. This finding is an agreement of finding of Melchior JC et al.¹²

The study results were shown concordance with Kaiser jon D. et al¹³ study as they found positive impact of food/nutrition. Micronutrient supplementation can significantly improve CD4 cell count reconstitution in HIV-infected patients taking HAART¹³. In this study CD4 cell count was increased insignificantly because nutritional status was poor as per HEI score and food/nutrition assessment form and patients were from low socioeconomic group.

LIMITATION OF THE STUDY

Owing to a small study group, the results of present study may not be applicable on general population suffering from HIV/AIDS.

CONCLUSION

The good diet (food/nutrition) has positive impact on immune status and body weight. Our observations underlie the fact that because the subjects under study were mostly from low Healthy Eating Index (HEI) score, therefore, the further rise of HAART induced CD4 cell count was not found to be significant.

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