

The Trend in Body Mass Index and Clinical Stage Response in HIV Patient after Initiation of Antiretroviral Treatment

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ABSTRACT

HIV infection remains a major global health concern. Antiretroviral therapy has been shown to be effective in improving the quality of patients' health. Recovery of BMI scores following the initiation of ART for HIV infection is clinically important for long-term health outcomes. It is necessary to find the effect of pre-treatment BMI and clinical characteristics on early immune recovery among patients treated with ART. This study aimed to assess the change of BMI and clinical responses. In the study, 93 people provided informed consent to participate. Almost of participants had BMI in normal weight (60.2%). There were 25.8% of patients had underweight. After 6 months, most of the study participants (98.9%) had BMI responses back to normal, and the proportions of patients who achieved clinical stages responses were increased significantly with $p < 0.05$. Clinical stages responses is likely associated with patient's baseline CD4 T cell. In conclusion, the present study finding that the majority of patients respond to first-line ART. BMI and clinical stages recovery were significantly increase after 3 and 6 month treatment. Our findings in this study suggest that clinical recovery were likely associated with baseline T CD4 of patients.

KEYWORDS: HIV/AIDS, ART, BMI, Clinical stage

ABBREVIATIONS:

HIV/AIDS: Human immunodeficiency virus / Acquired immunodeficiency syndrome

ART: Antiretroviral therapy

TCD4: Lympho T cluster of differentiation

BMI: Body mass index

I. INTRODUCTION

HIV infection remains a major global health concern. [1]. Infections with HIV have created a public health concern as both diseases though transmitted in similar ways may expose affected individuals to devastating morbidity. Recently, antiretroviral therapy has been shown to be effective in improving the quantity of patients health [2]. Recovery of BMI scores following the initiation of ART for HIV infection is clinically important for long-term health outcomes.

It is necessary to find the effect of pre-treatment BMI and clinical characteristics on early immune recovery among patients treated with ART. Therefore, we conducted this study aimed to assess the change of BMI and clinical responses in adult patients living with HIV/AIDS in Ho Chi Minh city, VietNam.

II. MATERIALS AND METHODS

Study design: This was a clinic based longitudinal study done at outpatient clinic, Tropical Diseases Hospital.

Study setting: The study involved 93 adult HIV-infected patients aged 18 and above who enrolled in HIV care and initiated on first line ART, with a minimum follow up of 6 months.

Study participants: The study involved 93 adult HIV-infected patients aged 18 and above who enrolled in HIV care and initiated on first line ART, with a minimum follow up of 6 months.

Data collection and laboratory analysis: The adult HIV patients on first line ART with a minimum follow up of 6 months were invited to participate in

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this study. These patients are usually followed up monthly. BMI and clinical stage measurements are usually routinely performed every months.

Clinical stage defined: Based on the WHO criteria for the clinical stage.

Statistical analysis: The data was entered, verified and cleaned, using Epidata spread and the data analysis was done using STATA. Continuous variables were summarized by medians and interquartile ranges, and categorical variables were summarized by frequency and percentage.

Consent to participate:

The consent to participate in the study was taken from all study participants because the study only recorded patients who provided written consent. All patients with immunological failure were switched into second line of ART following failure of improvement of their TCD4 two weeks of intensified adherence and in some with virological proof of ART treatment failure as per existing treatment guidelines. Patients who declined consent were not denied their services.

III. RESULTS

Overall, 93 people provided informed consent to participate in this study. Almost all patients were male and the median age was 30 (IQR 26–39). Majority of participants had BMI in normal weight (60.2%). There were 25.8% patients had underweight, that shows in **Table 1**.

Table 1 Baseline BMI (n=93)

Variable	Frequency	Percentage (%)
BMI (Kg/m²)		
Underweight (<18.5)	24	25.8
Normal (18.5 – 23)	56	60.2
Overweight (>23)	15	14.0

In study, after 6 months, the result showed that most of the study participants (98.9%) had BMI responses back to normal, and the steepest increase in the first 3 months, that shows in **Figure 1**

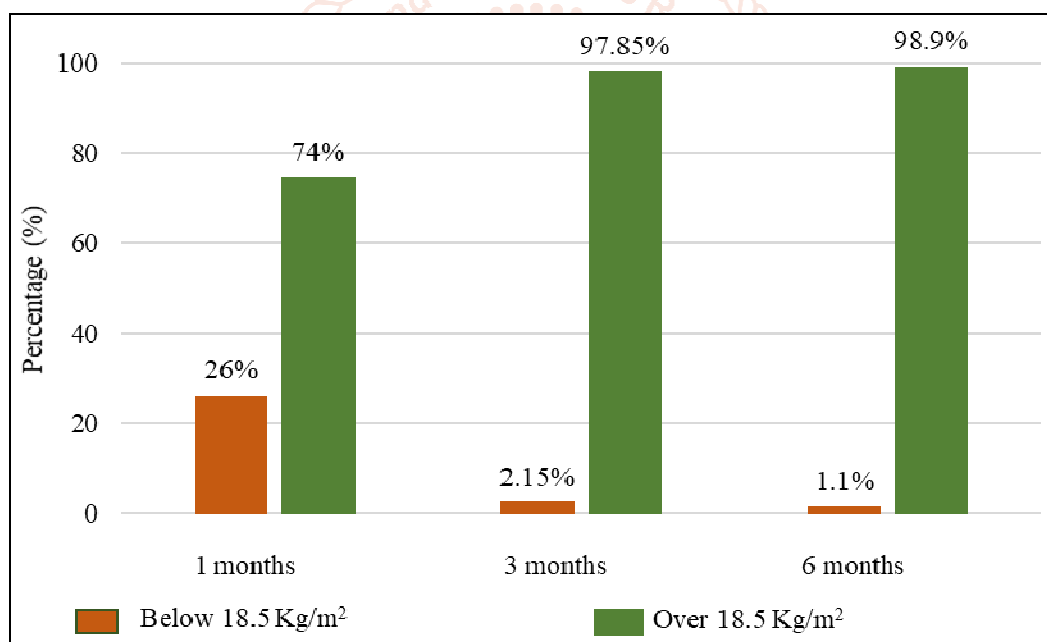


Figure 1 Slope of BMI after antiretroviral treatment

An analysis of the six-month responses, the proportions of patients who achieved clinical stages responses (Back to clinical stage I, based on the WHO criteria for clinical stage) after receiving 3 and 6 months of suppressive ART were increased significantly with $p < 0.05$, that show in Table 2. Meanwhile, clinical stages responses is likely associated with patient's baseline CD4 T cell.

Table 2 Clinical stage responses before and after week 12

Variable	0 month	3 months	6 months	p value*
Clinical stage I Frequency and Percentage %/ (n)				
Baseline TCD4 <200 cells/µl	19 (33.3)	49 (85.9)	55 (96.5)	p1<0.001 p2=0.03
Baseline TCD4 ≥ 200 cells/µl	23 (63.9)	35 (97.2)	36 (100)	p1< 0.001 p2= 0.3
*McNemar's test p1, p2: at point 3 months and 6 months compared to the original; p3: at 6 months compared to 3 months				

IV. Discussion

The findings show that, the trends in BMI of HIV patients after initiation of ART and the effect of baseline CD4 cell count on clinical stage recovery. Improvements in overall BMI and clinical stage among the patients were seen over time after 6 months. These findings are consistent with the retrospective longitudinal study conducted in which the BMI in patients underweight before ART is about 14% - 26% [3], [4] and they improving over time after treatment with ARV [5], [6]. Similarly, many studies also clearly investigated that BMI increased significantly after 6 months of the initiation of ART [7], [8]. These results suggest that BMI and clinical stage should be examined after 12 weeks from the initiation

The results of this study give the information about that most participants had BMI improvements was likely associated with the clinical stage recovery after 1 month in process, and it continued to increase significantly after 3 months and after 6 months. Given that BMI are the most strongly associated with a patient's clinical recovery, the possible explanation for this is due to immunity recovery of patients.

On the other hand, improvements in BMI and clinical stage response was likely different in two groups of patients who were AIDS stages and others. Although not completely likely, but some studies which were conducted from Ethiopia and China supported our result that clinical stage and BMI recovery in ART was associated with baseline CD4 T cells [10], [11], [12]

As any other sample-based study, our analysis has limitations. This study was based on a single clinic, the results may not necessarily be generalizable. We examined changes only within a 6-month period to look for correlations of clinical status and mentioned factors. It is possible that many changes over longer periods, which corresponds to more relevant factors.

V. Conclusion

In conclusion, the present study finding that the majority of patients respond to first-line ART. BMI and clinical stages recovery were significantly increase after 3 and 6 month treatment. Our findings in this study suggest that clinical recovery were likely associated with baseline TCD4 of patients. The introduction of ART has helped in improving the clinical status of the patients, as well as help to curb the prevalence of various opportunistic infection.

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agree with all of the interpretations of this paper paper.

Conflict of Interest

The authors declare no conflict of interest in this research.

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