CD4 Cell Count Trends after Commencement of Antiretroviral Therapy among HIV Patients At RIMS, Ranchi.

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Abstract
Aims and objectives - The aim of the study was to assess trends in CD4 cell counts in HIV infected patients before and after initiation of antiretroviral therapy at RIMS, Ranchi.
Materials and methods - In this study, 64 patients were included ,attending ART centre, RIMS Ranchi. Study period was from the month of January, 2017 to June, 2018. The CD4 counts before and after ART intervention of 6 months and 12 months respectively of all 64 patients were analysed by calculating mean and standard deviation.
Results - Present study shows that the mean CD4 count in 64 patients before ART was 226, with standard deviation of ±290.After 6 months of ART, the mean CD4 count increased to 440 with ±300 standard deviation of mean value. After 12 months of ART, the mean CD4 count decreased to 411 with ±281standard deviation of mean value.
Conclusion - This study shows rise in mean CD4 count in first 6 months followed by decline at end of 12 months therapy. Patients showing decrease in CD4 count should be investigated for viral load and drug resistance.
Keywords: CD4 Cell count, antiretroviral therapy, WHO guidelines.

I.   Introduction

Human immunodeficiency virus (HIV) is the causative agent of Acquired Immunodeficiency Syndrome (AIDS), it is lentivirus and member of reterovirus family[1]. In 2013 roughly 35.0 million people were living with HIV worldwide [2]. HIV patients with antiretroviral therapy have increased and have reached 9.7 million in the year 2012, in low- and middle-income countries [3]. HIV disease progression is scanned by CD4 count in case of patient's response to therapy[4]. There is increase in morbidity and mortality which is credited to treatment failure due to virologic failure, stopping HAART or lack of follow-up [5,6]. Reliable marker to assess disease progression and predict treatment outcomes would be useful for both the clinician and patient.

During advancement of HIV disease, CD4 counts acts as prognostic markers[7,8]. CD4 cells assists in evaluating the influence of HIV and effect of antireteroviral drug on patient undergoing therapy. To suppress HIV disease advancement, combination antiretroviral therapy (ART) has been highly effective in arresting HIV disease progression , regaining CD4 cell levels and minimising viral replication resulting in decrease of morbidity and mortality in HIV patients [9–13].

In absence of treatment , CD4 cell levels reduces slowly resulting in risk of AIDS-related illness and death. CD4 cells are invaded by HIV to replicate itself. Around one-quater of CD4 cell counts reduce straight away after HIV infection. For observation of HIV infection progress,CD4 count has been described as best surrogate marker, low CD4 counts are related to surge in risk of developing AIDS or death [14].

ART was started in advanced stage of HIV or in asymptomatic stages with CD4 count <200 cells/µl as per WHO treatment guidelines. But in 2015, there was revision in the WHO guidelines , according to which ART is recommended regardless of CD4 cell count.

II.   Methods

The study was conducted in ART centre Rajendra Institute of Medical Sciences, Ranchi. This is a reterospective cross-sectional study. Medical records of HIV patients were evaluated who were undergoing antireteroviral treatment among HIV positive patients. Study was conducted in the month of January 2017 to

June , 2018. Patient's baseline, sixth month and twelfth month CD4 cell count was taken from medical records. Few basic information like age , sex were also collected. Changes in baseline CD4 cell count (≤200 , 201-350 and >350 cell/μl) was recorded. Analysis was done by calculating mean and standard deviation. CD4 count was estimated by PARTEC cyflow machine.

III. Result and Discussion

Assessment of CD4 count of 64 patients undergoing ART treatment was done. Among them patients with CD4 count ≤200 were 35.9% , 201-350 were 23.4% and >350 were 40.6%.Changes in CD4 count after 6 months of treatment was as follows , 100% rise in ≤200, 80% rise and 20% fall in 201-350 and 66.4% rise and 34.6% fall in >350. Change in CD4 count after 12 months of treatment was 100% rise in ≤200,66.7% rise in 201-350 and 46.2% rise and 53.8% fall in >350 .

In this study 57% were male and 43% were female. Number of cases with continuous rise of CD4 counts in one year was 28.1%. There were 10.9% of cases with continuous decline of CD4 counts in one year. 23.4% cases were seen with continuous decline after slight increase in CD4 counts.

So the mean of CD4 count of patients before starting ART was 226 with standard deviation of ±290. After 6 months of ART treatment mean of CD4 count was 440 with standard deviation ±300 and mean after 12 months of ART treatment was 411 with standard deviation of ±281.

There was evaluation of immunological response rates with different CD4 cell in survey. Maximum increase in CD4 count was seen in first six months treatment. These results indicated that patients with baseline CD4 cell counts of ≤200 cell /μl had greater rate of immunological response compared to those with higher CD4 cell counts.

CD4 count after 6 months of ART treatment
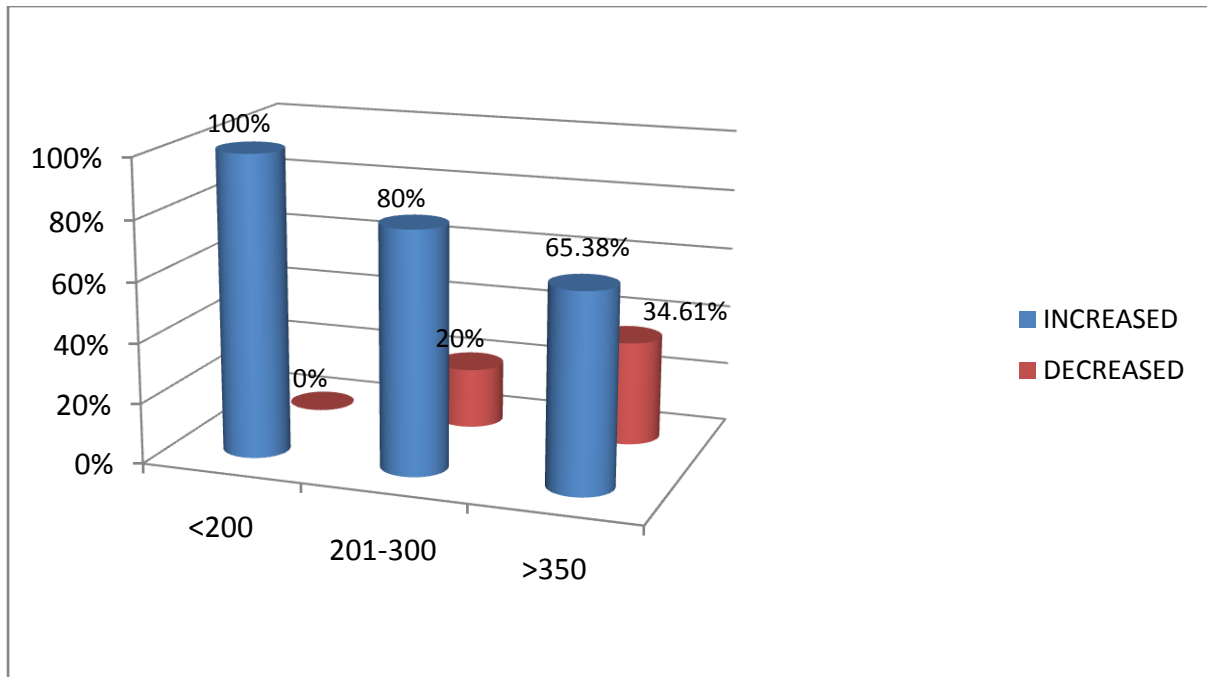
CD4 count after 12 months of ART treatment
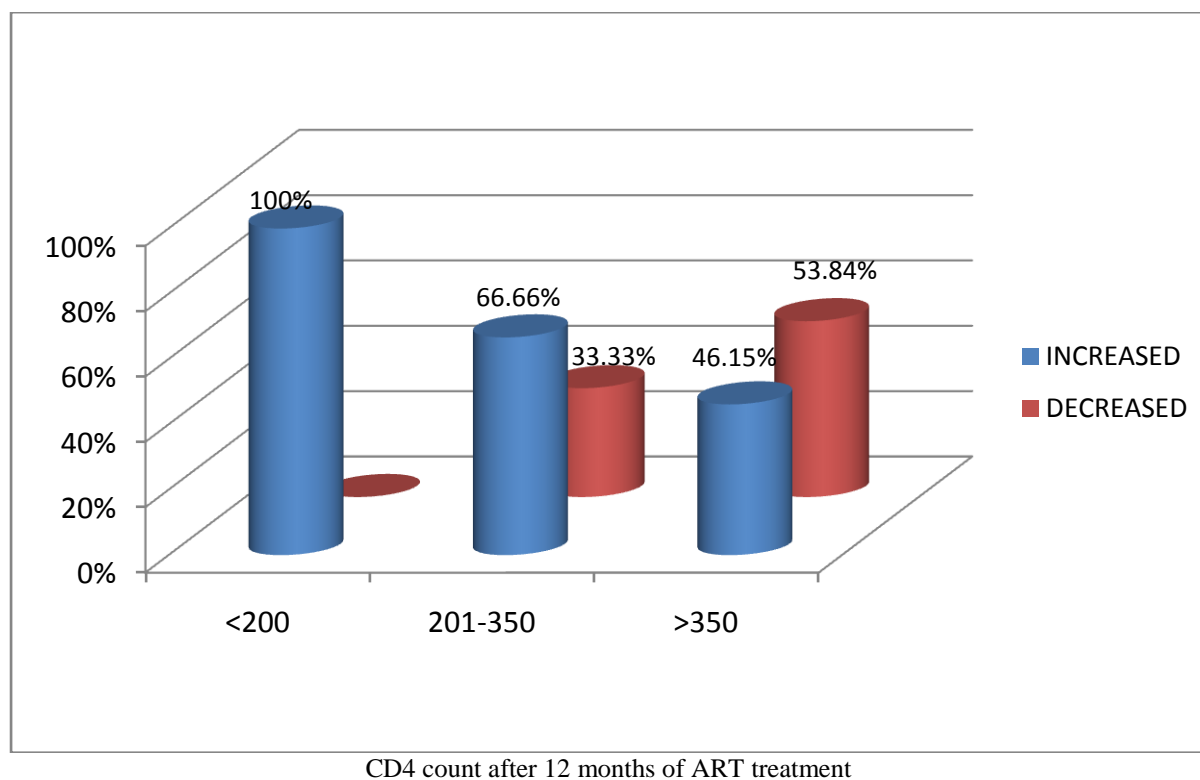
These finding are in line with that of another study of Asfaw et al [15], However, this overall observation is consistent with the findings of Bennett et al.[16], . Kaufmann et al. [17],Le Moing et al.[18] showed a similar but non-significant trend when comparing patients with baseline CD4 cell counts where patients with lowest CD4 counts had similar or greater rates of CD4 cell recovery and a lower rate of immunological non-response. Immunological non-response was independently associated with higher baseline CD4 cell counts of 201–350 and > 350 cells/μl , similar immunological non-response was also observed in Asfaw et al [15]. The regression of baseline CD4 cell count was an important predictor of immunologic failure. In case of decreased CD4 count, viral load and drug resistance should be investigated. Multiple variation seen in baseline CD4 cell count shows than it is a significant marker in assessment of disease progression and treatment.

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