



**A STUDY ABOUT INCIDENCE OF DYSLIPIDAEMIA IN COMPARISON WITH
PATIENTS ON ART AND NOT ON ART**

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ABSTRACT

Introduction: The extensive use of highly active antiretroviral therapy (HAART) which is highly effective in HIV patients has ended up with an high incidence of complications like HIV-associated lipodystrophy syndrome and the metabolic alterations, particularly lipid and glucose metabolism. Evidences in support of dyslipidaemia associated with First- line HAART in our geographical location is very minimal. The aim of the present study was to study and compare Lipid profile in HIV positive patients on ART with that of newly diagnosed HIV positive patients who were yet to be started on ART. **Materials and Methods:** Hundred newly diagnosed HIV positive patients who were yet to be started on ART were taken as controls. Similarly hundred randomly selected HIV+ patients who were already on ART regimen for more than 12 months were taken as cases. This study was conducted for a period of 12 months at the Government Dharmapuri Medical College, Dharmapuri. **Results:** There was a significant increase ($p < 0.001$) in serum Total Cholesterol, LDL-C, TG, VLDL, Non-HDL -C & TC/HDL-C ratio in ART patients compared to ART-naïve patients. ART has an effect on lipid parameters in HIV patients. **Conclusion:** It is clear from our study that there is increase in lipid profile in ART patients compared to ART Naïve group. Hence it appears reasonable to measure fasting lipid levels before and 3-6 months after antiretroviral therapy is initiated or when ART regimen is changed so that treatment for dyslipidemia may initiated at the earliest.

KEYWORDS: Dyslipidaemia, ART, HIV.

INTRODUCTION

The institution of highly active antiretroviral therapy (HAART) in 1996 for the treatment of HIV infection which was highly effective has led to intense reduction in the mortality and morbidity of people infected with HIV.^[1] Whereas the common use of ART has associated with increasing incidence of complications. Main complications related to ART are the HIV-associated lipodystrophy syndrome and the metabolic changes disturbing the lipid and glucose metabolism.^[2] Apart from phenotypic changes most of the patients develop insulin resistance and increased LDL levels in plasma, also total cholesterol and triglycerides. This has increased the worry that HIV-infected patients treated with ART may be at increased risk of developing premature coronary artery.

The cause of metabolic disturbances related to ART has not been understood well in detail. The aetiology is mostly due to effect of HIV and also direct and indirect effects of ART, along with other factors like genetic predisposition, gender and age. This concept leads to need of individualized ART treatment, based on

treatment criteria in addition to HIV-1 viral and CD4-cell count.^[3]

HAART regimens commonly has combination of 3 drugs at least which consist of protease inhibitors (PI), non-nucleoside reverse transcriptase inhibitors (NNRTI) and nucleoside reverse transcriptase inhibitors (NRTI).^[4] There are minimal studies in our geographical location regarding dyslipidaemia associated with ART in HIV patients.^[5,6] The aim of the present study was to study and compare Lipid profile in HIV positive patients on ART with that of newly diagnosed HIV positive patients who were yet to be started on ART.

MATERIAL AND METHODS

The participants were selected for study who gave informed consent for study, a total of 200 patients diagnosed and confirmed with HIV were selected among which 100 patients were on ART for 1 year atleast and rest 100 were not on ART who are newly diagnosed divided into two groups of 100 each. All patients were above 18 years of age and included both male and female. This study was conducted for a period of 12

months at ART centre, Government Dharmapuri medical college, Dharmapuri. The study was approved by the Institutional Ethical Committee. Complete data was collected from each participant. HIV was diagnosed in ICTC after counselling. From all patients 5 ml fasting blood sample was collected under aseptic precautions Blood sugar and Lipid profile were analysed from the sample. Statistical analysis was done using SPSS software Version 21. A probability value of < 0.05 was taken for statistical significance.

Table 1: General characteristics.

Sl.No	Characteristics	Not on ART (n=100)	ART (n=100)
1.	Age (years)	38.56 ± 10.21	41.56 ± 12.12
2.	Male : Female ratio	62:38	61:39
3.	Weight (Kgs)	40.62 ± 7.61	47.3 ± 9.21
4.	Tuberculosis	21	7
5.	VDRL	4	1
6.	Hbs Ag	6	0

Coming to comorbidities among those 200 patients in our study group 28 patients had co-infected TB whereas VDRL positive was seen in five patients and HbsAg was

RESULTS

The study included 100 newly diagnosed HIV patients and 100 HIV-positive patients on ART. The average age of the patients not on ART group was 38.56 ± 10.21 years and in ART group 41.56 ± 12.12 years with no significant difference ($p= 0.512$). There was no significant difference in sex distribution in both groups. The weight was significantly more in ART group (47.3 ± 9.21 Kgs) when compared to newly diagnosed group (40.62 ± 7.61 Kgs) with a p-value of 0.001.

positive in 6 cases. There was not much difference between both groups significantly.

Table 2: Lipid profile comparison between groups.

Sl.No	Parameters	Not on ART (n=100)	ART (n=100)	p-value
1.	Total Cholesterol (mg/dl)	142.28 ± 39.32	196.05 ± 31.4	<0.001
2.	HDL Cholesterol (mg/dl)	31.18 ± 9.78	32.19 ± 6.53	0.321
3.	Total Chol/HDL ratio	4.15 ± 0.69	5.21 ± 1.50	<0.001
4.	LDL Cholesterol (mg/dl)	89.58 ± 20.17	121.56 ± 32.12	<0.001
5.	Triglycerides (mg/dl)	131.56 ± 29.65	154.56 ± 35.62	0.012
6.	VLDL (mg/dl)	25.52 ± 6.53	28.62 ± 6.56	0.024
7.	CD4 Count	121.65 ± 84.3	385.52 ± 130.25	<0.001

There was a statistically significant difference in all lipid parameters like serum Total Cholesterol, LDL-C, Triglycerides, VLDL & TC/HDL-C ratio in ART patients compared to newly diagnosed patients. The lipid profile parameters was higher in ART patients compared to patients who are not on ART. All the parameters were analysed using students T test and chi square test and was statistically significant. Also the CD4 count was significantly more in ART patients (385.52 ± 130.25) when compared to ART-naïve patients (121.65 ± 84.3) ($P < 0.001$).

DISCUSSION

It is proven fact that Protease Inhibitors (PIs) causes increase in lipid profile in patients on ART.^[7,8,9] But there is not sufficient evidence in support of NRTI's like Zidovudine, Stavudine, Lamivudine and NNRTI's like Nevirapine, Efavirenz on lipid parameters patients on ART. Our study showed that ART patients has significantly high levels of Total Cholesterol, LDL-Cholesterol, Triglycerides, VLDL and high TC/HDL-C ratio when compared with newly diagnosed patients not on ART. But in contrast there was no significant difference in HDL levels between these groups. Even apart from levels the number of patients with

dyslipidaemia in ART group was higher than not ART patients similar to previous studies done in African countries.^[10,11] Similarly we also analysed and compared the prevalence of deranged lipid parameters with some of previous studies. Based on those studies to start with LDL levels, the prevalence rate of increased LDL levels (31.6%) was similar to that of previous study done in western India (30%).^[5] Similar to a study done in Cameroon^[16], our study showed no changes in HDL-C levels after ART, Whereas a study done in Western India didn't show any such changes.^[5]

Generally dyslipidaemia associated with an increase in cholesterol or triglycerides has an increased cardiovascular risk. Hence these results suggest that ART may essentially have harmful effects on the cardiovascular health of the HIV patients who are on such drugs. A large scale cohort studies are required to study the impact of dyslipidaemia on the cardiovascular health of HIV patients on ART. Similarly other confounding factors like co-morbidities also need to be analysed. A data collected by D:A:D study which was a prospective study done in 3 continents showed that ART is associated with a 27% relative increase in the rate of

Myocardial infarction per year of exposure during treatment.^[3]

CONCLUSION

To conclude, it is evident from our study that there is increase in lipid profile parameters except HDL in ART patients in comparison with newly diagnosed patients. Hence, it is sensible to measure fasting lipid profile in patients infected with HIV before starting antiretroviral therapy and also for every three months, so that necessary changes can be made to the treatment regimen.

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