

## Metabolic disorders in HIV infected patients on Antiretroviral Therapy in South India- a cross sectional study

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### ABSTRACT

Antiretroviral therapy (ART) has made HIV/AIDS a chronic and manageable disease. Complications associated with HIV infection and long term antiretroviral therapy include cardiovascular disease, lipid disorders, glucose metabolism disorders, adipose tissue disorders, bone metabolism disorders, and lactic acidosis. The objective of this study was to assess lipids abnormalities and insulin resistance in HIV infected patients on ART. This was a cross sectional study conducted in an ART centre at a tertiary care hospital in Chennai. HIV infected patients who attended the ART centre were enrolled into the study. After obtaining written informed consent, anthropometric measurements (height in cms, weight in kgs) were recorded. Body Mass Index (BMI) and Waist-Hip ratio (WHR) were calculated. History of HIV disease, CD4 counts and duration of ART were collected from patient's records. Fasting glucose and lipid assays (total cholesterol, triglycerides and HDL-c) were estimated by enzymatic-linked colorimetric methods. Insulin levels were tested using ELISA (Monobind Inc. USA) and insulin resistance was measured by homeostatic model assessment (HOMA) formula. All the tests were performed in the Department of Experimental Medicine, The Tamilnadu Dr. MGR Medical University, Chennai. Statistical analysis were done using SPSS, Pearson's and Spearman's correlation was used to find the strength of relationship among the variables. A total of 100 (57 males & 43 females) HIV infected patients were enrolled into the study. The median age was  $41 \pm 8.1$  years (IQR: 34 - 58) and were receiving ART for more than one year (duration:  $1 \frac{1}{2}$  -11 years). Seventy nine received fixed dose combination of Zidovudine/Lamivudine/Nevirapine (ZLN), 4 were on Tenofovir / Lamivudine / Nevirapine (TLN) and 17 were on Tenofovir / Lamivudine / Efavirenz (TLE) regimen. The mean BMI and WHR were  $22.5 \pm 3.98$  and  $0.95 \pm 0.10$  respectively. The recent median CD4 counts were  $579 \pm 278.5$  cells/ $\mu$ l (IQR: 424-725). Seven male and four female were found to be diabetic, the mean value of fasting glucose was  $94 \pm 35.1$  and The mean total cholesterol was  $223 \pm 45.4$  and hypercholesterolemia was observed in 21 patients (12 males & 9 females). The mean triglyceride was  $159 \pm 101.1$  and hypertriglyceridemia was found in 28 patients (19 males & 9 females). Nine (5 males & 4 females) had lower HDL-c ( $<40$  mg/dl) and 49 (26

males & 23 females) had higher LDL-c. A strong negative correlation was observed between total cholesterol and CD4 counts ( $r = -0.06$ ,  $p < 0.001$ ), LDL-c and CD4 counts ( $r = -0.107$ ,  $p < 0.001$ ). There was a positive correlation between duration of ART and HOMA ( $r = 0.049$ ,  $p = 0.759$ ) but was not statistically significant. The study has demonstrated that 49% of the HIV infected patients who were on ART for more than one year had dyslipidemia. High cholesterol levels were observed in patients were on TLN and TLE regimens. All HIV infected patients on ART for more than one year should be monitored for lipid and insulin levels.