SUMMARY

BACKGROUND:

HIV infected individuals may be at greater risk of developing cardiovascular diseases due to the presence of multiple cardiovascular risk factors. This study was mainly aimed at evaluating the prevalence of high blood pressure (HBP), left ventricular hypertrophy (LVH), obesity, dyslipidaemia, and diabetes mellitus (DM) in individuals with HIV/AIDS; possible metabolic abnormalities associated with exposure to HIV and HAART. In addition the study determined association between CD4 count and these cardiovascular (CV) risk factors. The study also aimed at determining the pattern of various ECG abnormalities and indices of left ventricular diastolic and systolic function using echocardiography among HIV positive individuals.

METHODOLOGY:

Four hundred subjects were studied. Three hundred (300) HIV Positive subjects (150 HIV positive on HAART and 150 HIV positive-HAART naïve) of whom 99 (33%) were males and 201 (67%) were females. One hundred (100) apparently healthy HIV negative subjects formed the control group of whom 32 (32%) were males and 68 (68%) were females. The HIV study group and the controls were matched for age and sex. Ethical clearance was obtained from the Health Research Ethics Committee of the University of Nigeria Teaching Hospital (UNTH) and written informed consent obtained from study participants. Interviewer administered questionnaire, anthropometric and blood pressure measurements were obtained using standard protocols. Blood samples were obtained for determining fasting plasma glucose and lipid levels. All the study subjects had a 12 lead surface
electrocardiogram recording while echocardiography was performed and analyzed in 26 HIV positive cases and findings compared to 26 HIV negative age and sex matched controls. Emphasis was focused on investigating for LVM, systolic dysfunction and diastolic dysfunction.

**STUDY DESIGN:**

This was a cross-sectional descriptive study of patients with HIV/AIDS seen in the clinic and wards of UNTH.

**RESULTS:**

The prevalence rates of cardiovascular risk factors among the HIV subjects were as follows: high blood pressure (22%); increased waist circumference (WC) (27%); low HDL-c (69%), elevated Total cholesterol (TC) (32%), elevated LDL-c (15%), and elevated Triglyceride (TG) 14%; LVH (3.8%). Impaired fasting glucose and DM was (4%). Forty-seven (31.3%) of the HAART exposed subjects had elevated HBP compared to 20 (13.3%) in the HAART naïve group (p= 0.001).

The HAART exposed subjects had higher mean Tc (5.12±1.36 mmol/L) and higher mean LDL-c (2.72±1.04 mmol/L) compared to Tc of (4.28±1.09 mmol/L) and LDL-c of (2.18±0.94 mmol/L) for HAART-naïve subjects; (p< 0.001). The HAART- naïve subjects had lower HDL-c (0.91±0.43 mmol/L) and higher TG (1.24±0.65 mmol/L) compared to HDL-c (1.22±0.50 mmol/L ;p < 0.001) and TG (1.14±0.54 mmol/L; p< 0.002) for HAART exposed subjects. CD4 count showed a significant positive but weak relationship with systolic blood pressure (SBP), diastolic blood pressure (DBP), Tc, LDL-c, HDL-c, and WC (P = <0.05; r>0.05); but a significant negative weak relationship with TG (P=0.025; r = -0.130).
The major ECG abnormalities among the HIV positive cases were: sinus tachycardia 26 (17.3%), left atrial abnormality 58 (38.6%) and right bundle branch block 4 (2.7%). Ten (38.5%) of the cases of HIV had LV diastolic dysfunction compared to 2 (7.7%) of the controls (Fisher’s exact sig. = 0.019). Four (15%) of the HIV positive cases had left ventricular systolic dysfunction while none of the controls had detectable LV systolic dysfunction. Approximately 4% of the HIV infected individuals had LVH while none of the controls had detectable LVH. LVH was higher among HIV infected individuals compared to controls (69.85±15.24 g/m$^2$ vs 57.34±11.43 g/m$^2$; p=0.002).

**CONCLUSIONS:**

1. HBP is more prevalent among HAART exposed subjects compared to HAART naïve-subjects.
2. HIV infection is associated with a high burden of dyslipidaemia. Of significance is a higher burden of low HDL-c and elevated TG in the early stages of HIV infection.
3. Improved immune function is associated with increasing SBP, DBP, Tc, LDL-c, HDL-c, glucose and WC; but lower TG
4. A high proportion of HIV positive subjects have abnormal ECGs.
5. LV diastolic dysfunction and systolic dysfunction is relatively common in HIV positive subjects. HIV infection is associated with increased LVMI.