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ABSTRACT

Background

This study was carried out to assess the potential clinical utility of measuring apo B 100 in evaluation of CVD risk. The study focused on measurement of the classic parameters of assessing CVD risk. LDL cholesterol and HDL cholesterol have been the cornerstone of stratifying CVD risk. LDL cholesterol is considered to be the major lipid risk factor but it has emerged that apo B 100, as a proxy for all atherogenic lipid particles, is a better marker for CVD risk. Risk of CVD in the HIV infected population appears to be relatively higher than in the general population and thus appropriate screening measures for CVD are needed. There is growing support that addition of apo B 100 measurement to the routine lipid panel would enhance patient management.

Methods

Sixty ART naive (35 females), 62 HIV positive on ART (47 females) and 64 HIV negative participants (52 females) were recruited from Harare Hospital adult OIC. These participants were aged between 18 and 65 years old and consented to participate in the study and the mean age was 38.4 ± 10.4. A questionnaire eliciting socio-demographic and medical history was administered prior to collection of a blood sample for evaluation of lipid status. Total cholesterol, LDL cholesterol, HDL cholesterol, apo B and glucose were determined on the Dimension, Dade Behring analyser (Siemens Healthcare Diagnostics S.A). Ten-year CVD risk scores were calculated using an online calculator formulated by Dr Rupert Payne of the University of Edinburgh in May 2010.
Results

There was an increase in mean total cholesterol, LDL cholesterol and apo B levels from HIV negative people to HIV positive ART naive patients and finally to HIV positive on ART patients which was statistically significantly different (p value< 0.001). There was a decrease in mean HDL cholesterol from 1.6 to 1.4 to 1.1 mmol/L across the three groups which was also statistically significantly different (p value<0.001). Generally risk of CVD in the HIV infected population appeared to be relatively higher than the other two groups. Diabetes, age, gender, smoking, and systolic blood pressure had a positive effect on the lipid parameters. There was a weak positive significant correlation between Framingham risk score and apoB (r=0.26, p<0.001). There was no correlation found between Framingham risk score and LDL-c (r=0.144, p=0.11). A moderate positive significant correlation (r=0.44, p<0.001) was found between apo B and LDL-c.

Conclusion

In this study it was observed that ART increases lipid parameters like total cholesterol, LDL-c and apo B levels thereby increasing risk of CVD. HDL-c levels were decreased in patients on ART. ART therefore seem to affect lipid parameters. The current guidelines should recommend routine monitoring of lipid parameters in HIV patients on ART to actively investigate these changes. Apo B should be included in lipid profiles since there was a weak positive correlation with the Framingham risk score in assessing risk of developing CVD. Apo B also reflects the atherogenic particles not only LDL but also VLDL and IDL.
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**LIST OF ABBREVIATIONS**

- **AIDS**  
  Acquired immune deficiency syndrome
- **AMI**  
  Acute myocardial infarction
- **Apo B 48**  
  Apolipoprotein B 48
- **Apo B 100**  
  Apolipoprotein B 100
- **ART**  
  Antiretroviral therapy
- **ARV**  
  Antiretroviral
- **CVD**  
  Cardiovascular Disease
- **DNA**  
  Deoxyribonucleic acid
- **g/L**  
  grammes per litre
- **HCH**  
  Harare Central Hospital
- **HIV**  
  Human immunodeficiency virus
- **HDL–c**  
  High Density Lipoprotein cholesterol
- **HIV- 1**  
  Human immunodeficiency virus type 1
- **HIV- 2**  
  Human immunodeficiency virus type 2
- **IDL**  
  Intermediate Density Lipoprotein
- **LDL-c**  
  Low Density Lipoprotein cholesterol
- **mmol/L**  
  milli moles per litre
- **NECP**  
  National Cholesterol Education Programme
- **nm**  
  nanometres
- **NNRTIs**  
  Non-nucleoside reverse transcriptase inhibitor
- **NRTIs**  
  Nucleoside reverse transcriptase inhibitor
- **NtRTIs**  
  Nucleotide reverse transcriptase inhibitor
- PI: Protease inhibitor
- RNA: Ribonucleic acid
- Rpm: revolutions per minute
- TB: Tuberculosis
- WHO: World Health Organization