

**BASELINE SEROLOGICAL MARKERS OF HEPATITIS B VIRUS CO-INFECTION  
IN THE DEVELOPMENT OF ANTIRETROVIRAL THERAPY FOR AFRICA  
(DART) POPULATION OF HUMAN IMMUNO DEFICIENCY VIRUS INFECTED  
PATIENTS**

**By**

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## **ABSTRACT**

Hepatitis B virus (HBV) seroprevalence and serology profiles were retrospectively determined for 957 individuals in the Development of Antiretroviral Therapy for Africa (DART), human immunodeficiency virus (HIV) infected population. Baseline HBV serology markers were tested for and samples identified for viral load test in the HBV sub study investigating development of HBV Tenofovir (TDF)/lamivudine (3TC) resistance in HIV-1 positive treatment naïve individuals initiating TDF/3TC combination therapy as part of HAART. The patients received TDF/3TC combination therapy as part of HAART and samples were taken at baseline and at 4, 12, 24 and 48 weeks and every 48 weeks thereafter until last visit, up to 6 years. All samples were tested for anti-HBc and HBsAg with further testing for anti-HBs and HBe markers in anti-HBc+/HBsAg- and anti-HBc+/HBsAg+ samples respectively using enzyme immune assays. In this population 164 patients were HBsAg positive giving a 17.1 % HBsAg seroprevalence (males 18.3 %, females 15.8 %). Five hundred and thirty (530) samples or 55.4 % were positive for the anti-HBc marker. One hundred and thirty five patients had isolated anti-HBc and will be tested for occult HBV, 103 were anti-HBc+/HBsAg+/HBe marker + and were identified for viral load tests on baseline and follow up samples to investigate HBV TDF/3TC resistance evidenced by viral rebound. The results infer a high prevalence of HBV co-infection in HIV infected individuals in Zimbabwe. HIV positive individuals are at risk of co-infection with HBV because of the shared routes of infection of HIV and HBV. This is supported by the high level of exposure to HBV evidenced by 55.4 % anti-HBc seroprevalence in the DART cohort. There was evidence of active hepatitis, 103 individuals with positive HBe markers, and HBV DNA tests can be done on these baseline and follow up samples to monitor the efficacy of TDF/3TC combination therapy in suppressing viral rebound. Viral load tests can also be done on 135 samples with isolated anti-HBc to determine the prevalence of occult HBV in this cohort.

**KEY WORDS:** HBV seroprevalence, HIV co-infection, HBV tenofovir/lamivudine resistance

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## **ABBREVIATIONS AND CODES**

HBV	Hepatitis B Virus
DART	Development of Antiretroviral Therapy for Africa
HAART	Highly Active Antiretroviral Therapy
ART	Antiretroviral therapy
3TC	Lamivudine
CBV	Combivir
AZT	Zidovudine
NVP	Nevirapine
ABC	Abacavir
AIDS	Acquired Immunodeficiency Syndrome
CD4	Clusters of Differentiation number 4
CD8	Clusters of Differentiation number 8
STI	Structured Treatment Interruption
HIV	Human Immunodeficiency Virus
Anti-HBc	Hepatitis B virus core antibody
HBeAg	Hepatitis B virus e antigen
Anti-HBe	Hepatitis B virus e antibody
HBsAg	Hepatitis B virus surface antigen
Anti-HBs	Hepatitis B virus surface antibody
DNA	Deoxyribonucleic Acid
WHO	World Health Organisation
ALT	Alanine aminotransferase
AST	Aspartate aminotransferase
AFP	Alfa-Feroprotein

LFT	Liver Function Test
CDC	Centers for Disease Control
cccDNA	covalently closed circular DNA
RNA	Ribonucleic Acid
mRNA	messenger RNA
NsRTI	Nucleoside Reverse Transcriptase Inhibitor
NtRTI	Nucleotide Reverse Transcriptase Inhibitor
YMDD	Tyrosine-Methionine-Aspartate-Aspartate
S gene	Surface gene
Pre-S1	Pre-Surface1
Pre-S2	Pre-Surface2
ORF	Open Reading Frame
MHC	Major Histocompatibility Complex
TNF alpha	Tumor Necrosis factor alpha
HDV	Hepatitis D virus
PHC	Primary Hepatocellular Carcinoma
EIA	Enzyme Immunoassays
PCR	Polymerase Chain Reaction
RT qPCR	Real Time quantitative PCR
INF –alfa	Interferon alfa
FTC	Emtricitabine
RT	Reverse Transcriptase
dNTP	deoxy Nucleotide Triphosphate
ATP	Adenosine Triphosphate
M	Methionine
L	Leucine
V	Valine

I	Isoleucine
N	Asparagine
T	Threonine
A	Alanine
RFLP	Restriction Fragment Length Polymorphism
NC	Negative Control
PC	Positive Control
TMB	Tetramethylbenzidine
BL	Blank