

PLASMA INTERLEUKIN- 10 LEVELS IN HIV AND HBV CO-INFECTED ADULTS  
FROM MOMBASA COUNTY, KENYA

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## Abstract

Human Immunodeficiency Virus-1 (HIV-1) and Hepatitis B Virus (HBV) co-infection is a common public and clinical health burden in Kenya. This is because these blood borne pathogens share modes of transmission. Drug users, especially injecting drug users (IDUs), are at a higher risk of acquiring and transmitting these viruses because they often share unsterilized syringes and engage in risky sexual behaviors. Mombasa County serves as the entry and transit point for drugs and consequently have the highest number of IDUs. Co-infection with HIV-1 and HBV results in severe disease outcomes and rapid progress to AIDS. Following HBV infection, HIV-1 infected patients are six times more at risk of developing chronic hepatitis B than HIV-1 negative individuals. HIV-1 also enhances the development of HBV related liver diseases. Interleukin 10 is an immunoregulator cytokine that function to control the balance between immunopathology and protective responses in infection. Interleukin 10 is usually associated with antiviral immune response suppression. Both HIV -1 and HBV infections up regulate IL 10 expression which in turn controls various aspects of the infection processes. Despite the importance of IL-10 in disease progress, little is known about the role it plays in HIV-1 and HBV co-infection pathology mechanisms. Therefore, a cross sectional study will be conducted at Bomu Medical Centre, Mombasa County to determine the levels of circulating IL-10 and their effect on immunological correlates in HIV-1 and HBV co- and mono-infected adults in Mombasa County. IL-10 levels will be measured using IL-10 enzyme linked immunosorbent assay. The samples will be tested for HIV-1 using Abbott Determine<sup>®</sup> HIV-1/2 rapid test and confirmed using Uni-Gold<sup>®</sup> test. HBsAg presence will be determined using one-step HBV-5 panel rapid diagnostic kit. The viral loads will be determined using polymerase chain reaction. CD4 T cells will be enumerated using FACSCalibur machine. Basal metabolic index will be calculated using the height and weight measurements of the study subjects. The data collected will be analyzed using SPSS (version 22) and GraphPad Prism (version 6.0) statistical programs. Across groups comparison will be done using Kruskal Wallis whereas paired groups comparison will be done using Mann-Whitney U test. Spearman's rank correlation test will be used to determine the relationship between IL-10 and CD4 T cells, viral load and basal metabolic index. A probability of  $\leq 0.05$  will be considered statistically significant. The results obtained will help in improving the understanding of HIV and HBV co-infection pathology and development of new therapies that can be effective against the coinfection and vaccines.

**List of Abbreviations and Acronyms**

ART	Anti-retroviral therapy
CSIF	Cytokine synthesis inhibitory factor
CTLs	Cytotoxic T-lymphocytes
DC	Dendritic cells
GBO	Global health observatory
HAART	Highly active antiretroviral therapy
HBcAg	Hepatitis B core antigen
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B
HCC	Hepatocellular carcinoma
HIV	Human immunodeficiency virus
IFN- $\gamma$	Interferon gamma
KANCO	Kenya AIDS NGO'S consortium
NACC	National AIDS control council
NHE	National HIV estimates
NK cells	Natural killer cells
TLRs	Toll like receptors
TNF	Tumor necrosis factor