

Extent of Drug Resistance Mutations among HIV-1 Positive Drug-Naive Patients In Kenya

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ABSTRACT

Antiretroviral drugs targeting the reverse transcriptase and protease enzymes of HIV-1 are widely used in the management of HIV-1. Eventually, in spite of continual medication, resistance to the medication develops leading to an exponential multiplication of in the virus in the body, and in most cases, death of the victim. Development of resistance to antiretroviral medication can occurs in persons on antiretroviral therapy, but can also be transmitted to drug naïve patients or could occur by chance or can be transmitted to in persons who have never taken medication. The main objective of this study was to determine the extent of HIV-1 drug resistance mutations in HIV-1 positive drug naïve persons in Kenyan population. To achieve this, HIV-1 positive plasma samples from seventy-eight (78) drug naïve subjects were collected from Health Centers in five provinces in Kenya. HIV-1 viral RNA was extracted from plasma samples using Qiagen® RNA isolation kit and a portion of the HIV-1 reverse transcriptase (RT) gene amplified by nested PCR using a set of specific primers targeting a region where mutations conferring resistance to antiretroviral medication are prone to occur. The amplified products were analysed by gel electrophoresis and visualized under UV light. The successfully amplified products were then sequenced using the Big Dye® sequence terminator technology (Applied Biosystems®). A portion of the RT gene (697bp in size) was successfully sequenced for 78 samples. From analysis of the sequences, it was determined that NNRTI associated resistance mutations were present at sites G98A of the amino acid codon in 2.56% of the samples; K103E mutation in 1.3% of the samples and mutation L100F in 3.57% of the samples. From the 78 samples successfully analyzed, only one sample had a significant mutation that could confer resistance to ARVs, specifically Nevirapine (1.3%). This indicates in general, that drug resistance among HIV-1 positive drug naïve persons is at low thresholds. However, it should be

noted that only 78 samples were analyzed and hence the problem could be more serious than reported here. Drug resistance associated mutations detected in this study confer resistance to Nevirapine and low resistance to Delavirdine, etravirine and enfuvirtide. Of the 78 samples analyzed, 50% were HIV-1 subtype A1; 35.9% were subtype C; 10.25% were subtype D and 3.85% were CRF A1D. (3.85%) were identified. This analysis indicated that HIV-1 Subtype A1 is the predominant subtype circulating in Kenya. .