

# **Drug Resistance Mutations and Genetic Diversity in Adults Treated for HIV Type 1 Infection at Amana Hospital, Dar es Salaam**

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## **Background**

As more HIV patients join antiretroviral therapy (ART) programs in resource-limited settings the emergence of HIV drug resistance (HIVDR) is inevitable. This will have consequences for the transmission of HIVDR, the success of ART, and the nature and trend of the epidemic.

## **Objective**

To determine drug resistance mutation and genetic diversity in adult patients on ART

## **Methodology**

We followed a cohort of 223 patients starting or continuing their first-line ART and followed up for one year. HIV-1 genotyping was performed with the ViroSeq HIV-1 Genotyping System. Mutations and polymorphisms were scored by the Rega algorithm in the reverse transcriptase and protease region of HIV nucleotide sequences.

## **Results**

Of these patients 50 had baseline samples, 26 of which were treatment naïve at that time. Fifty five, one-year follow-up samples had a detectable viral load. Only 22.6% of patients on treatment for at least 6 months were failing virologically, but this increased with treatment duration. From 41 patients, protease and reverse transcriptase genotyping was successful at study baseline and/or at one year follow-up. Eighteen were samples from therapy-naïve patients and 23 samples were taken under therapy either baseline for patients already under ART at study entry, or follow-up sample. The isolates were mostly subtype A followed by C and D at 41.5%, 22% and 12.2% of the patients, respectively. No major PI mutation was found in any of the samples. Among the 23 samples taken under therapy, 19 carried DRMs. The most observed nucleoside reverse transcriptase inhibitor (NRTI) mutation was 184V in 16 patients causing resistance to lamivudine and emtricitabine. Nineteen patients had NNRTI resistance mutations, the most common of which was 103N (8 patients). Other mutations included thymidine associated mutations.

## **Conclusion**

Given these high levels of resistance among virologically failing patients to the recommended drugs in the Tanzania National HIV Care and Treatment guidelines, regular drug resistance surveillance is highly needed in Tanzania in order to inform on the control of emergence and transmission of drug resistance in the population, and to guide decisions on changes in treatment guidelines.