Abstract

Mother-to-child transmission (MTCT) of HIV-1 is responsible for infection of hundreds of thousands of infants every year. It is estimated that 600,000 newborns are infected yearly worldwide, with MTCT accounting for 90% of these infections. Human immunodeficiency virus (HIV) can be transmitted from mother-to-child at various stages of pregnancy including in utero and intra partum. A number of feasible and effective interventions to reduce MTCT among women of child hearing age are available. These interventions include prevention of primary HIV infection, avoiding unwanted pregnancies among HIV positive women, reduction of transmission from infected mothers to infants during pregnancy, labour, delivery and breathfeeding through provision of voluntary counselling and testing (VCT) services, antiretroviral therapy (ART), safe delivery practices, and breast milk substitutes. However, these approaches are not always possible in resource-poor countries. The use of antiretroviral (ARV) drugs, in particular revirapine, zidovudine and zidovudine/lamivudine combination, has been studied in both developing and developed countries. Although these studies have shown reduction in transmission of HIV, concerns regarding the development of drug resistant strains have been raised. The Ministry of Health in Kenya has implement nevirapine regimen to reduce MTCT in the public health facilities. This study aimed to investigate drug resistance in an MTCT setting in Kenya. A total of 309 HIV seropositive pregnant women taking part in the prevention of mother of child transmission of HIV (PMTCT) programme in three hospitals, namely, South Nandi Hills, Kapsabet, and Kitale district hospitals were enrolled in this study. A structured questionnaire was used to collect demographic information. Venous blood was collected into vacutainer tubes containing EDTA as anticoagulant. The enumeration of T-lymphocytes was carried out by flow cytometry and viral load was determined by nucleic acid amplification. The proviral HIV DNA extracted from peripheral blood mononuclear cells (PBMCs) was sequenced to determine the drug resistance associated mutations and HIV-1subtypes. The significance of associations was investigated by chi-square test and odds ratios. The HIV prevalence among the pregnant women was 6.7% (309 of 4638). The majority (85%) of the women visiting the antenatal clinic were not aware of their HIV status. Sixty percent (60%) of pregnant women had a CD4 count of more than 350cells/mm3 . The HIV transmission rate was 6% (4 of 59 infants). Drug resistance associate mutations were detected as minor population except in one mother-child pair where major populations were found. Nevirapine drug resistance was detected in 19.4% (7 of 36) and 100% (3 of 3) of the women and infants tested respectively. Even though the women had not been exposed to nucleoside reversed transcriptase inhibitors (NRTIs), drug resistance associated mutations were detected in 8 mothers (22.2%) as minor populations. The major circulating HIV-1 subtype in North-Rift Kenya was identified as A1 (50% and 71.8%) based on the env (C2V3) and pol (RT) regions respectively. Human immunodeficiency virus type 1 subtypes D (12.8%), C (10.3%), A2 (2.6%) and G (2.6%) were also detected based on sequencing of the pol region. Drug resistance outcomes in mothers and infants should be considered as an important secondary end point in PMTCT assessment.