ABSTRACT
Experiences of early antiretroviral treatment failures are increasingly linked to escalating pretherapy HIV resistance mutations. Regular update of epidemic status and impact of pretherapy resistance are needed in resource limited countries, including Kenya. Since pretherapy resistance survey has not been conducted and factors associated remain unknown in the high-HIV prevalence western Kenya region, this study aimed to establish the prevalence of pretherapy antiretroviral resistance, the associated factors, the mutations’ impact on treatment, the HIV subtypes and phylogenetic relationships in the major urban establishment of Kisumu. Two hundred and forty HIV-1 infected persons were consecutively recruited and followed-up for 12 months at 2 facilities between 2013 through to 2015. Blood samples along with demographic information were obtained at both study baseline and follow-up end-point. Genetic sequence analysis of partial pol gene was performed on all baseline, and the end-point samples that had viral RNA≥1000 copies/mL. Calibrated Population Resistance tool and Drug Resistance Database algorithms for HIV were used in the interpretation of baseline and end-point resistance mutations respectively. Subtyping was performed using REGA v3.0, RIP v3.0 and in addition phylogenetic relationship analysis was performed using MEGA 6.0. Prevalence were calculated in percentages, categorical variables compared by \( x^2 \) and fisher’s exact test while continuous variables were compared by Mann-Whitney U test. Factors that had \( p<0.2 \) by univariate analysis were fitted into regression models to determine associations and impacts of resistance. A moderate prevalence of 8.8% pretherapy ARV resistance was established, that seemed more likely among younger patients although age was not significant. HIV-1 subtype A1 was found to be dominant (64%), and 71% of the Kisumu’s subtype C tended to cluster more closely with the southern Africa viral infection. Although pretherapy resistance increased the likelihood of treatment failure \( (p=0.029) \), the NNRTI mutations only did not imply virologic failure at least in the short-term for 47% of the patients. The presence of multiclass HIV drug mutations was associated with heightened virologic failure \( (OR=4.3; \ p=0.025) \) amongst the patients who had pretherapy resistance. Receipt of ARV regiment with GSS<2.00 was likely to result in treatment failure \( (hazard \ ratio=3.5) \). A moderate pretherapy resistance found in Kisumu is adversely impacting on treatments. The moderate pretherapy resistance necessitates regular antiretroviral resistance surveillance. More intense monitoring of HIV-infected patients initiating first-line treatment in Kisumu is necessary to identify the increased patients at risk of early virologic failure. Conclusive analyses will require large survey studies.