The investigation of genotypic antiretroviral drug resistance in the context of the South African national antiretroviral roll-out programme

by
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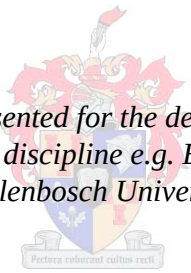

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Introduction: Transmitted HIV drug resistance (TDR) can compromise initial antiretroviral therapy (ART), resulting in early therapy failure despite good adherence. In a population with a high prevalence of TDR, early or baseline resistance testing may be necessary to determine an optimal, individual ART regimen, which is not feasible in resource-constrained settings. We evaluated the prevalence of TDR in recently HIV-infected adults in the Western Cape province, South Africa, using the World Health Organization's threshold surveillance method.
Methods: We included specimens sent consecutively for CD4 counts to the Tygerberg laboratory if they fulfilled the following criteria: patient 15 - 20 years old; CD4 count >500/µl; not on ART according to request form. After anonymisation, population sequencing was performed. Sequences were interpreted using the calibrated population resistance (CPR) tool of the Stanford University database according to the updated WHO surveillance drug resistance mutation (SDRM) list.
Results: Specimens from 49 females and 1 male, median age 19 (range 15-20) years, median CD4 count 655/µl (range 505 - 2569) were included, of which 38 (76%) were successfully amplified and sequenced. The survey was discontinued thereafter based on the absence of SDRM list mutations; using the WHO threshold analysis classification, this result predicts a low (< 5%) prevalence of TDR to all three drug classes in this population. The T74S resistance associated polymorphism was detected in two samples. This polymorphism is frequently observed in HIV-1 subtype C and together with other primary resistance mutations causes resistance to certain protease inhibitors.
Conclusion: According to the WHO SDRM list no TDR was detected in this survey, suggesting a low prevalence (< 5%) of TDR in the Western Cape Province four years after the public-service ART roll-out programme was started. While this is encouraging, ongoing vigilance is required to ensure the continued success of the programme.