Antiviral drug resistance in Cuban children infected with HIV-1

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Between 1986 and 2011, 100 children have been diagnosed with HIV-1 in Cuba. 38 have acquired HIV-1 by vertical transmission, 6 by blood transfusion and 56 by sexual contacts (teenager). Currently, AZT/D4T + 3TC + NVP/KALETRA are available for the treatment of pediatric patients. The aim of the study was to monitor the subtype distribution and emergence of drug resistance in pediatric HIV-1 infections. Plasma from 46 HIV-1-infected children were collected from November 2005 to November 2011, subsequently extracted, amplified and sequenced. Phylogenetic analysis was performed using Mega 4 (Neighbour joining, Kimura 2). The CPR tool v6.0 (WHO list 2009) was used to interpret transmitted drug resistance (TDR). In addition, acquired drug resistance was interpreted according to HIVdb v6.1.1. Experiments were successful for 28 samples from 20 patients (5 patients with multiple samples). At the moment of analysis, 17 children were receiving ART. The median age at diagnosis was 1.9 years, whereas the median age at sampling was 4.5 years. Ten children were male (50%), 16 (80%) were infected by vertical transmission, 1 by blood transfusion (5%) and 3 by sexual route (15%). The subtypes were CRF18_cpx (25%), CRF19_cpx (25%), B (20%), CRF20_BG (10%), G (10%), CRF24_BG (5%) and C (5%). 82.3% of the children who were receiving ART at sampling displayed at least one drug resistance mutation. The most common NRTI and NNRT mutations were: M184V (55.5%), T215FY (16.6%) and K70R (16.6%); and K103NS (61.1%) and G190A (22.0%). In contrast, only one PI mutation, L90M (5.5%), was observed. 5.8% of these children displayed single NRTI class resistance, 17.4% single NNRTI class resistance, 59% double NRTI + NNRTI class resistance and 5.8% triple NRTI + NNRTI + PI class resistance. According to HIVdb, NRTI, NNRTI and PI resistance was present in respectively 42.8%, 58.7% and 8.08% of the treated children. High-level NVP and EVF resistance was observed in 76.5% and 58.8%, respectively. 35.2% displayed already low-level resistance to ETR/RPV. For NRTI, high-level resistance to 3TC/FTC was detected in 50%. High-level resistance to NFV was detected in only one sample. No NNRTI TDR was observed, while one patient displayed PI TDR (L90M) and another NRTI TDR (D67N, T215S and K219Q) (2/11) (18.1%). At this moment, insufficient data is available whether resistance is associated with TDR, poor adherence to treatment or poor efficacy of ART regimens in use. The present study reinforces the usefulness of resistance tests for the correct management of ART.