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Correlation between patterns of HIV-1 drug resistance and drug administration in antiretroviral experienced patients in Greece during 1999–2006

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Purpose of the study

There is a global trend for declining HIV-1 resistance over time in antiretroviral-experienced patients. We aimed to investigate if the decreasing resistance to N(t)RTIs and PIs among the treated patients in Greece during 1999–2006, is correlated with the administration of any particular drugs.

Methods

HIV-1 genotypic resistance was determined from 1,327 treated patients failing on the first treatment regimen (HIV-RNA >1000 copies/mL) later than 1998. All sequences along with a detailed treatment history record were stored in a HIV sequence database. Potential association between the levels of resistance and the percentage of drugs received before resistance testing per year was explored by estimating the slope of change in the proportion of resistant strains over increasing drug use.

Summary of results

Increased duration of TDF was associated with decreasing levels of resistance ($p < 0.001$). The slope of change in % resistance for 10% increase in drug administration was -0.026. A similar trend was observed also for ABC (slope: -0.078, $p < 0.001$). On the other hand, increased use for ZDV, 3TC and d4T was associated with increasing resistance ($p < 0.001$). No trend was found for ddI. Decreasing resistance to PIs was associated with boosted PIs such as bLPV (slope: -0.038, $p < 0.001$), bATV (slope: -0.119, $p < 0.001$) and bTPV (slope: -0,126, $p < 0.001$), but not for bSQV(slope:0.62, $p < 0.001$). Similarly elevating resistance was correlated with increased use for IDV (slope: 0.051, $p < 0.001$), SQV (slope: 0.093, $p < 0.001$), RTV (slope: 0.074, $p < 0.001$) and NLF (slope: 0.036, $p = 0.019$).

Conclusion

Patterns of resistance over time are correlated in a different way with the administration of particular drugs. Importantly, ABC, TDF and boosted PIs (bLPV, bATV and bTPV) are associated with decreasing resistance to N(t)RTIs and PIs during 1999–2006.