Antimicrobial resistance

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Cytochrome P450 (CYP2B6*6c.516G>T) variants in Congolese individuals with HIV and TB mono and dual infections.

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Abstract

Background:

The inter-individual genetic polymorphism of cytochrome P450 (CYP) enzymes (CYP), involved in the metabolism many drugs, partly modulates drug response and toxicity. Single nucleotide polymorphisms of CYP2B6 for example, G516T have been implicated in high and sub-therapeutic plasma concentration of the current antimalarial, HIV and TB first-line drugs in various geographical regions and thus undermines effective disease management. At present, there is no data on the frequency of CYP2B6 c.516G>T among the Congolese population. This is in spite of a significant number of people undergoing antimalarial, HIV and TB treatment that relies on CYP2B6-based drug clearance or activation.

Methods: A total of 418 patients with HIV-1 mono-infection, HIV-1+TB coinfection and P. falciparum infection were genotyped for CYP2B6 c.516G>T polymorphism using PCR-RFLP. The frequencies of the alleles as well as the genotypes (GG, GT and TT) were determined.

Results: The frequency of CYP2B6 c.516G>T polymorphism was 69% and frequency of G and T alleles were 45% and 55%, respectively. 17.0% (49/288) of participants were GG (extensive metabolizer), 55.2% (159/288) of participants were GT (intermediate metabolizer) and 27.8% (80/288) of participants were TT (poor metabolizers).

Conclusion
This study highlights CYP2B6 c.G516T polymorphism as a potential determinant of drug response and toxicity among the Congolese population, particularly those undergoing antiretroviral, malaria and tuberculosis treatment within the current first-line drug policy framework.

**Keywords:** HIV-1, tuberculosis, artemisinin, cytochrome P450 polymorphism, Republic of Congo, Brazzaville.