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Effect of CYP2B6 c.516G>T and c.983T>C Single Nucleotide Polymorphisms on Plasma Nevirapine Levels in Zimbabwean HIV/AIDS Patients

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Abstract : Given the high prevalence of HIV/AIDS in sub-Saharan Africa, and the elusive search for a cure, understanding the pharmacogenetics of currently used drugs is critical in populations from the most affected regions. Compared to Asian and Caucasian populations, African population groups are more genetically diverse, making it difficult to extrapolate findings from one ethnic group to another. This study aimed to investigate the role of genetic variation in CYP2B6 (c.516G>T and c.983T>C) single nucleotide polymorphisms on plasma nevirapine levels among HIV-infected adult Zimbabwean patients. Using a cross-sectional study, patients on nevirapine-containing HAART, having reached steady state (more than six weeks on treatment) were recruited to participate. Blood samples were collected after patients provided consent and samples were used to extract DNA for genetic analysis or to measure plasma nevirapine levels. Genetic analysis was carried out using PCR and RFLP or Snapshot for the two single nucleotide polymorphisms; CYP2B6 c.516G>T and c.983T>C, while LC-MS/MS was used in analyzing nevirapine concentration. CYP2B6 c.516G>T and c.983T>C significantly predicted plasma nevirapine concentration with the c.516T and c.983T being associated with elevated plasma nevirapine concentrations. Comparisons of the variant allele frequencies observed in this group to those reported in some African, Caucasian and Asian populations showed significant differences. We conclude that pharmacogenetics of nevirapine can be creatively used to determine patients who are likely to develop nevirapine-associated side effects as well as too low plasma concentrations for viral suppression.

Keywords : allele frequencies, genetically diverse, nevirapine, single nucleotide polymorphism
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