Pharmacogenetics in a Caribbean population in the Dominican Republic

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Interindividual variability in drug response represents a major clinical challenge, as it can compromise both therapeutic efficacy and safety, thereby increasing the risk of adverse drug reactions (ADRs). Genetic variants relevant to drug response show clear ethnogeographic distribution, highlighting the need for population-specific genotyping strategies. The Dominican Republic is a Caribbean population with a well-documented geographic and historical background that predicts a substantial African genetic ancestry component. This suggests a potential association between ancestry and the distribution of genetic variants in key drug-metabolizing enzymes used in clinical practice (*CYP2D6, CYP2C9*, and *CYP2C19*), as well as in genes involved in antineoplastic treatment (*DPYD*).
The study revealed a high proportion of African (AFR) ancestry in the Dominican population compared with other Latin American groups previously analyzed by the Ibero-American Network of Pharmacogenetics and Pharmacogenomics (RIBEF). This ancestry profile correlated with increased frequencies of variants typically enriched in African populations, resulting in the presence of metabolizer phenotypes that require adjusted dosing or alternative drug prescriptions according to current clinical guidelines. These findings highlight the urgency of expanding pharmacogenetic research in non-European populations to ensure equitable access to safe and effective pharmacotherapy. Moreover, they support the development of ancestry-informed genotyping panels tailored to the molecular characteristics of each population.
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