CYP Polymorphisms in a Psychiatric Clinical Population

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• Psychiatric medications are associated with variable response rates and a narrow
• The prescribing information of some commonly used psychotropes contains
• CYP genes are highly polymorphic, and the prevalence of single nucleotide polymorphisms
• the prevalence observed in a reference population
of mental health patients undergoing commercially available pharmacogenetic testing to
varying ethnic descent by comparing the prevalence of CYP phenotypes of a sample

METHODS: We compared the prevalence of CYP metabolic phenotypes of a sample of
mental health patients undergoing commercially available pharmacogenetic (PGx) testing (the Genomind® assay) to the prevalence observed in reference populations. Specifically, we compared the prevalence of CYP metabolic phenotypes of a sample of African-American and Caucasian psychiatric patients tested by the use of the Genomind® assay to that of healthy individuals utilizing data obtained from the 1000 Genomes Project. Patient-reported ethnicities for the mental health cohort were used to make population-specific comparisons. CYP genes that were significantly different in phenotype frequency within specific ethnicities were identified and chosen for further examination.

RESULTS: Our study revealed ethnicity-specific differences in CYP phenotype frequency compared to the global population. Specifically for CYP3A4, Caucasian psychiatric patients had a significantly higher proportion of non-normal metabolizers compared to the reference population (Fisher Exact Test; p-value = 0.0041), while African-American patients had a significantly higher proportion of normal metabolizers (Fisher Exact Test; p-value = 0.0217). We observed no significant differences in metabolic phenotypes between the Hispanic mental health cohort and the reference population for CYP2C9 and CYP2C19 (p-values > 0.05).

Our study revealed significant differences in CYP metabolism phenotype frequency within specific ethnicities of the mental health patients and healthy participants. Our results suggest that Caucasian psychiatric patients undergoing PGx testing are more likely to have non-normal metabolism for the CYP3A4 enzyme than their healthy counterparts. This differs in the African-American psychiatric population, for whom we noted significantly more normal metabolizers in the PGx cohort. These results indicate wide variation in CYP metabolism among clinical populations.

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To the extent to which CYP variations impact real-world, clinical populations of varying ethnic descent by comparing the prevalence of CYP phenotypes of a sample of mental health patients undergoing commercially available pharmacogenetic testing to the prevalence observed in reference populations.

CYP Variation and Pharmacogenomic Testing

• CYP genes are highly polymorphic, and the prevalence of single nucleotide polymorphisms
• These SNPs affect the rate at which patients metabolize medications, influencing
• Medication-related side effects do not occur in a consistent manner among populations.
• CYP gene variants are associated with response rates and a narrower
• Pharmacogenomic testing provides a pharmacogenetic basis for personalized treatment to help mental health patients optimize clinical response for individual patients based on, in part, on CYP genotype

RESULTS:

• For each CYP450 enzyme reported, a proportion of the total population was observed to have non-normal or normal phenotypes for each of the CYP450 enzymes.
• The phenotype frequency observed for various ethnic subgroups of a mental health

REFERENCE: