Is CYP2C19 Genotyping Useful Prior to New Drug Administration in the ED?

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WHAT WE LEARNED

CYP2C19 genotyping is unlikely to be useful prior to new drug administration in ED patients.

BACKGROUND

- CP450 polymorphisms result in variable rates of drug metabolism, impacting safety and efficacy.
- The prevalence of CYP2C19 polymorphisms in an ED population is unknown.

OBJECTIVE

- To determine the % of ED patients on CYP2C19-dependent drugs and to determine the prevalence of CYP2C19 polymorphisms in an ED population.

METHODS

- Secondary analysis of a prospective observational study of hydrocodone effectiveness in an urban academic ED.
- Detailed drug ingestion histories were taken for the 48 hours preceding the ED visit (Home); CYP2C19 drugs coded as: not dependent, substrate, inhibitor, or inducer.
- Drugs administered in the ED or prescribed from the ED (ED/Rx) were coded similarly.
- 10% of patients randomized to undergo CYP2C19 genotyping.

Table 1: Patient Demographics

Demographics	Population (n=502)
Age, years (IQR)	39 (22-53)
Male Sex, n (%)	198 (39%)
Race, n (%)	
African-American	162 (32%)
American Indian/Native	25 (5%)
Asian	9 (2%)
Caucasian	326 (65%)
Hispanic/Latino	98 (20%)
Median # of Home Drugs, n (IQR)	3 (1-6)
Home CYP2C19 Drug	131 (26%)
ED/Rx CYP2C19 Drug	51 (10%)
CYP2C19 Genotype (n=53)	
Ultra-Rapid Metabolizer	0
Extensive (normal) Metabolizer	52 (98%)
Intermediate Metabolizer	0
Poor Metabolizer	1 (2%)

LIMITATIONS

- This was a single center study in Aurora, CO.
- Non-English speaking patients were excluded in the original study, which may have limited the heterogeneity of the sample; CYP2C19 polymorphisms may vary amongst racial groups and are more common in Asians.

RESULTS

- 502 patients were included; see Table 1.
- 131 patients were on a home CYP2C19 drug; 18 of these patients were given an ED/Rx CYP2C19 drug (3.6% total population).
  - 29 patients on a home CYP2C19 drug with narrow therapeutic index (warfarin, clopidogrel, topiramate); 5 of these patients given an ED/Rx CYP2C19 drug (1% total population).
- 53 patients randomized for genotyping.
  - 52 patients (98%) extensive (normal) metabolizers, 1 patient poor metabolizer.

CONCLUSIONS

- 3.6% of ED patients were at risk for CYP2C19 drug-drug interactions.
- When considering only drugs with narrow therapeutic indices, 1% of ED patients were at risk for drug-drug interactions.
- The vast majority of ED patients studied were extensive metabolizers.

AAM receives salary support from NIH 1 K23 GM110516 01 and NIH UL1 TR001082