Feasibility of implementing a personalized approach to chronic pain management using CYP2D6 genotype in a primary care clinic

D. Max Smith, PharmD; Kristin Weitzel, PharmD, FAPhA; Randy Hatton, PharmD, FCCP, BCPS; Amanda R. Elsey, M.H.A.; Larisa Cavallari, PharmD; Julie A. Johnson, PharmD

1Department of Pharmacy, UF Health Shands Hospital, Gainesville, FL; 2College of Pharmacy, University of Florida, Gainesville, FL.

BACKGROUND

- Codeine, tramadol, and selected other opioids are metabolized by cytochrome P450 (CYP) 2D6 to forms which have a greater affinity for μ-opioid receptors.
- CYP2D6 genotype polymorphisms can lead to altered plasma concentrations and analgesic effects of these medications.
- Clinical Pharmacogenetics Implementation Consortium (CPIC) guidelines provide clinical guidance, but additional data are needed regarding incorporating these data into clinical practice.

OBJECTIVES

Primary: 
- Determine the logistical feasibility of a personalized approach that incorporates CYP2D6 genotype data in an interdisciplinary chronic pain management service

Secondary: 
- Describe how pharmacists incorporate CYP2D6 genotype data into medication therapy problem identification
- Summarize pharmacists’ recommendations to the physician.

METHODOLOGY

Design: 
- Single center, retrospective, chart review using descriptive statistics
- Approved by the University of Florida IRB

Inclusion criteria: 
- Enrolled in parent trial at an implementation site between 05/01/2015 and 12/16/2015
- Adults treated in a family medicine clinic
- History of pain for at least 3 months
- Prescribed medication for pain relief

Exclusion criteria: 
- Pain for less than 3 months
- Not currently prescribed any medication for pain

Parent Trial: 
- Non-randomized, parallel assignment, open label, prospective trial
- Compares pain scores between patients who received CYP2D6 genotyping plus a pharmacist consultation to those who received standard therapy

Enroll in parent trial
Initial MD visit and sample collection
CYP2D6 genotype result
Pharmacist clinical consultation
Follow-up MD visit (~4 wks)

BASELINE DEMOGRAPHICS

CYP2D6 Phenotype

- N = 58; 43% male
- 72% White and 28% Black or African American
- Nearly two thirds of extensive metabolizers were prescribed a CYP2D6 interacting medication

Primary Outcome

Determine feasibility of incorporating CYP2D6 genotype data into pain management services.

Definition of feasibility: 
- Patient buccal sample successfully ordered and collected
- CYP2D6 genotype result entered into electronic medical record (EMR) prior to follow up visit
- Pharmacist consultation note provided to prescribing clinician prior to patient follow up visit

Results: 
- 54 of 58 patients (93%) met all defined feasibility components

<table>
<thead>
<tr>
<th>Reason Feasibility Component Unmet</th>
<th>N (%)</th>
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<tbody>
<tr>
<td>Sample recollection needed</td>
<td>2 (3.5)</td>
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<tr>
<td>Genotype required further analysis</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td>Enrollment at an atypical time period</td>
<td>1 (1.7)</td>
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</tbody>
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REFERENCE

2. Implementing Genomics in Practice (IGNITE) Proof of Concept Study: Genotyping in Family Medicine Clinics. NCT02335307.

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For more information, please contact Max Smith via email at smidma@shands.ufl.edu
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