Psychiatric Pharmacogenetic Testing in an Adult Psychiatric Inpatient Population

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Background
• Outcomes for treating depression remain suboptimal, despite increasing medication options.
• Early work has shown that personalized genomics testing can improve treatment outcomes in many fields of medicine. However, no prior work has investigated the efficacy of pharmacogenetic testing in psychiatric inpatient populations.

Study Objectives
• This pilot, open-label study investigated the feasibility of implementing pharmacogenetic testing in an inpatient unit as well as exploratory analyses of symptom outcomes measured 3 months after psychiatric hospitalization for anxiety and depression-related diagnoses.

Methods

Patient Sample
Patients (n=75) were recruited from a short-term acute care inpatient unit for depression and anxiety, had a mean age of 32 (SD=13.2) years, and identified as 76.0% White/Caucasian, 6.7% Black/African American, 11.7% Hispanic. Patients had a mean length of stay of 14.8 days (min=1, max=82, SD=13.6).

Measures
APA DSM-V Level 1 Cross-Cutting Symptom Measure – A 23-item self-report measure of 13 psychiatric symptom domains.1
APA DSM-V Level 2 Symptom Specific Measures, and Severity Measures – Surveys completed if indicated by the Level 1 Cross-Cutting Symptom Measure for the following symptoms: depression, anger, mania, anxiety, somatic symptoms, sleep disturbance, repetitive thoughts and behaviors, and substance use.1
WHODAS 2.0 – A 12-item measure of quality of life impairment.2
Pharmacogenetic Testing Impressions Survey – A self-report inventory of participant impressions using the pharmacogenetic assay report created for this study. Items were rated on a Likert scale of “1 strongly disagree” to “5 strongly agree”.3
FAST Additive Summary of Treatment – An inventory of commonly prescribed psychiatric medications, supplements, and treatments.

Genecept® Assay, (Genomind, King of Prussia, PA)
• Reports variants of 18 genes that according to literature significantly impact pharmacodynamic or pharmacokinetic response to psychiatric treatment.

Procedures
• In this open-label randomized pilot study participants were assigned to control and experimental conditions and completed a psychiatric pharmacogenetic assay.
• Pharmacogenetic assay results were given to the experimental group and their psychiatrists prior to discharge, and to the control group three months later.
• Psychiatrists could adjust the medication regimen of patients in the experimental group at their discretion if warranted by the assay.
• Participants were completed self-report surveys with an electronic data capture program before discharge and 3 months later.

Analysis
All self-report symptom and surveys were analyzed using repeated measures ANOVA comparing the experimental group to the control group. All statistical analyses were conducted in R version 3.5.1.

Results

Psychiatric Symptomatology

Quality of Life Impairment

Substance Use

Selected Mean Participant Ratings on Pharmacogenetic Testing Impressions Survey (Scale of 1-5, “1 strongly disagree” to “5 strongly agree”)

I have an overall understanding of the personalized pharmacogenetic testing and what it means for my medication regimen.

Because of the personalized pharmacogenetic testing results, I feel more comfortable asking my treatment provider questions about my current and future medication regimen.

The personalized pharmacogenetic testing results will help my outpatient treatment provider with finding the right medication regimen for me in the future.

The medication regimen informed by the pharmacogenetic testing will be more effective than the previous medication regimens based a “try and see” treatment approach.

Treatment decisions informed by the personalized pharmacogenetic testing results have made me more hopeful that I will experience fewer side effects from my future prescribed medications.

Discussion

• This open-label pilot study conducted in hospitalized patients with depression and/or anxiety suggests that psychiatric pharmacogenetic testing may significantly improve broad psychiatric symptomatology, quality of life impairment, and substance misuse when compared to standard antidepressant psychiatric care.
• Significant differences in reduction of anxiety and depression symptomatology during the measured time period were not observed. Considering the small sample size of this pilot study, it may have not been sufficiently powered to detect changes in anxiety and depression.
• Future studies should investigate psychiatric pharmacogenetic testing efficacy in larger, higher-powered samples, account for medication changes resulting directly from test results, and investigate differences that may account for treatment response following pharmacogenetic testing.
• Pharmacogenetic testing in psychiatry is still in its preliminary phase, in particular since large scale studies suggest that effect sizes of common variants are likely to be too small for use in individual precision medicine. This study adds to evidence supporting the use of pharmacogenetic testing in psychiatric settings, including use for seriously ill patients. The optimal application of such tests, including the inclusion of specific pharmacokinetic and pharmacodynamic gene variants, remains to be defined.

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References