Background

Pharmacogenomic (PGx) testing analyses genetic variations that may affect medication outcomes and can be a valuable tool to inform treatment decisions. Large randomized controlled trials have demonstrated that PGx-guided care significantly improves remission, response,1,2 and symptoms3 in patients with major depressive disorder (MDD) and at least one treatment failure.

Receiving medications congruent with the PGx testing result has been shown to be a critical factor in improving these MDD outcomes.4 However, little is known about the impact of PGx testing in real-world settings.

OBJECTIVES

The current study used a large US administrative claims database to determine:

1. The proportion of MDD patients prescribed medications with significant gene-drug interactions pre- and post-PGx testing.
2. Hospitalizations pre- and post-PGx testing.

STUDY COHORT

A dataset was generated by linking patients who received combinational PGx testing (GeneSight®, Myriad Genetics, Inc.) to administrative claims from the Optum Labs Data Warehouse.

Before linkage, the datasets were tokenized and Expert Determination was employed to yield a de-identified dataset with low risk of re-identification. The study cohort was created from the linked dataset using the inclusion/exclusion criteria shown in Figure 1.

COMBINATORIAL PGX TESTING

Medications prescribed 90 days pre- and post-PGx testing were organized by the GeneSight test report into the following categories: 1) no known gene-drug interactions, 2) moderate gene-drug interactions, or 3) significant gene-drug interactions.

CONGRUENCY GROUPS

1. Medications with no or moderate gene-drug interactions were considered congruent. Medications with significant drug interactions were considered incongruent.
2. Patients taking one or more incongruent medications were considered incongruent; otherwise, they were considered congruent.

HOSPITALIZATIONS

The number of patients with any, psychiatric, and non-psychiatric hospitalizations was statistically compared (McNemar’s tests) between the 180 day pre- and post-PGx testing periods in the overall cohort and by congruency group.

Method

Patients with PGx test results in the claims database (n=543,791) and September 30, 2022 (n=178,364).

Enrolees with medical and pharmacy coverage between January 1, 2015, and Eligible: Enrolees with an ID code for MDD (n=2,153).

Patients with continuous enrollment (≥365 days prior to index date) and no 180 day post index date (n=26,687).

Fig. 3: Following PGx testing, the percent of patients with hospitalizations was significantly reduced in all patients with medications. The percent of patients with any hospitalization and psychiatric hospitalizations were significantly reduced by 29% and 39%, respectively. No significant differences were observed in non-psychiatric hospitalizations.

Results

High levels of psychiatric comorbidities were observed in the total MDD cohort during the 180-day baseline, with ~78% experiencing comorbid anxiety. These real-world results are representative of expected comorbidities in MDD patients.4,5

Figure 4: Hospitalizations by Congruency Group in Patients Prescribed Medications at Baseline and Follow-up (n=16,965).

Fig. 2: Following PGx testing, the proportion of patients prescribed medications with significant gene-drug interactions decreased. This suggests that, in a real-world setting, PGx test results are being used for medication decisions similar to findings in randomized controlled trials.1,2

Fig. 3: Hospitalizations in Patients Prescribed Medications at Baseline and Follow-up (n=16,965).

Fig. 1: Patient selection flow chart

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Fig. 5: Patient selection flowchart demonstrating how the total MDD cohort was derived following inclusion and exclusion criteria.

The index date was defined as the date the PGx test result was reported to the healthcare provider.

Conclusions

Post-PGx testing, fewer patients were prescribed medications with significant gene-drug interactions and hospitalizations were reduced compared to pre-PGx testing. These real-world results are consistent with multiple prospective studies demonstrating the utility of PGx-guided treatment for improving response and remission rates in MDD.6,7,8 Future directions include investigating the impact of post-PGx medication selection on healthcare costs.

References:


Disclosures: AQT, PM, DC, KT, and HLJ were employees of Myriad Genetics, Inc. at the time of the study and received salary and stock options.