The Clinical Utility of Combinatorial Pharmacogenomic Testing for Patients with Depression: A Meta-Analysis

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Here, we present the results of a meta-analysis of prospective, two-arm studies examining the clinical utility of using the combinatorial pharmacogenomic test, GeneSight Psychotropic®, to inform treatment decisions for patients with MDD who had at least one prior medication failure.

METHODS

- The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Guidelines were utilized for this meta-analysis.
- A systematic search was performed, and all identified reports were screened to identify two-arm, prospective studies evaluating the clinical utility of this specific test that included patients ≥18 years of age diagnosed with MDD who had at least one prior medication failure.
- All included studies assessed symptom improvement, response, and remission using the 17-item Hamilton Depression Rating Scale (HAM-D17).
- The pooled mean effect of symptom improvement and pooled relative risk ratio (RR) of response and remission were calculated using a random effects model.
- Sub-analyses were performed according to study type.

RESULTS

- Overall, 1,556 patients were included from four studies (two open-label studies and two randomized controlled trials (RCT)).
- Patient outcomes were significantly improved for patients with MDD whose care was guided by the specific combinatorial pharmacogenomic test results compared to unguided-care (Figure 1).
- When the analysis was restricted to RCTs, all endpoints remained significant.
  - Symptom Improvement: 10.08, [1.67, 18.50], 0.019
  - Response RR: 1.40, [1.17, 1.67], <0.001
  - Remission RR: 1.49, [1.17, 1.89], 0.001
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CONCLUSION

- In a meta-analysis of 4 independent studies, all outcomes were significantly improved for patients in the GeneSight Psychotropic® guided-care arm vs TAU.
- This meta-analysis adds to the body of evidence supporting the clinical utility of using GeneSight Psychotropic® to guide medication selection for patients with MDD that have experienced at least one medication failure.

<table>
<thead>
<tr>
<th>Study</th>
<th>Guided-Care</th>
<th>Unguided-Care</th>
<th>Difference</th>
<th>A</th>
<th>95% CI</th>
<th>p-value</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall-Flavin et al. 2012</td>
<td>22</td>
<td>22</td>
<td>12.60</td>
<td>[0.95, 24.25]</td>
<td>0.034</td>
<td>22.1%</td>
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<td>Hall-Flavin et al. 2013</td>
<td>72</td>
<td>93</td>
<td>17.00</td>
<td>[6.89, 25.35]</td>
<td>&lt;0.001</td>
<td>27.9%</td>
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<td>Winner et al. 2013</td>
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<td>24</td>
<td>10.10</td>
<td>[-8.01, 28.21]</td>
<td>0.274</td>
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<tr>
<td>Greden et al. 2019</td>
<td>621</td>
<td>677</td>
<td>3.20</td>
<td>[0.24, 6.05]</td>
<td>0.069</td>
<td>36.1%</td>
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</tr>
</tbody>
</table>

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