Cost-utility analysis of lisdexamfetamine dimesylate in the treatment of adults with attention-deficit/hyperactivity disorder in the United Kingdom

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BACKGROUND

• Attention-deficit/hyperactivity disorder (ADHD) is a chronic neurobehavioural disorder with considerable costs to healthcare systems and society.1,2

• The UK National Institute for Health and Care Excellence recommends starting adults with ADHD on a stimulant, methylphenidate (MPH), followed by atomoxetine (ATX) or dexamfetamine (DEX) for those who have an inadequate response or are intolerant to MPH.3

• Lisdexamfetamine dimesylate (LDX) is a prodrug; following absorption, LDX undergoes hydrolysis to DEX. LDX is already approved in many countries4 for the treatment of ADHD in children and adolescents.

OBJECTIVE

To determine the cost-effectiveness of LDX compared with MPH and ATX in an adult population.

METHODS

• A decision-analytic model was developed from the perspective of the UK National Health Service (Figure 1).

• The health outcomes of the model were: unable to tolerate, response and nonresponse.

• Costs and outcomes were estimated by simulating the number of adult patients with ADHD who did achieve response to treatment or who did not.

• The base-case analysis evaluated direct medical costs and health-related quality of life associated with 1 year of treatment, including the initial 28-day drug titration period.

• Various sensitivity analyses were conducted to test the robustness of the results.

• Quality-control procedures were performed on the model to ensure model programming and input data sources.

RESULTS

Table 1. Relative risks (drug vs placebo)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Relative risk</th>
<th>Placebo risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDX</td>
<td>2.14 (1.71, 2.57)</td>
<td>0.3084 (0.296, 0.353)</td>
</tr>
<tr>
<td>ATX</td>
<td>1.85 (1.00, 3.22)</td>
<td>0.0443 (0.035, 0.053)</td>
</tr>
<tr>
<td>MPH-ER</td>
<td>1.84 (1.44, 2.36)</td>
<td></td>
</tr>
</tbody>
</table>

Other columns: Discontinuation owing to adverse events, Response, Nonresponse.

Figure 1. Model structure

Model assumptions

• Patients who experience intolerable side effects are assumed to discontinue treatment in the middle of the titration period (i.e. after 14 days on treatment) and will have the same utilities and costs as nonresponders after the titration period for the rest of the 1-year model period.

• Patients who respond to treatment at the end of the titration period remain on treatment throughout the model’s time horizon and maintain their response to treatment.

• At the end of the titration period, nonresponders discontinue treatment with immediate loss of any treatment effect.

• The analysis compared LDX with MPH and LDX with ATX, administered as directed in their clinical trials.

Model parameter inputs

Health-state utilities

- Efficacy and safety

Efficacy data were taken from a mixed-treatment comparison (MTC) analysis of all clinical trials identified in the systematic review (Table 1).

- Tolerability was assessed by discontinuation rates due to adverse events.

- Sensitivity analyses

One-way sensitivity analysis

- Health-state utility values, resource utilization costs, time horizon, drug costs and length of titration period for ATX were varied.

- Results were most sensitive to changes in the time horizon.

- Probabilistic sensitivity analysis

- Results were robust to a wide range of parameter variation.

CONCLUSIONS

- LDX as a replacement for MPH-ER is cost-effective at the willingness-to-pay threshold of £20,000 per quality-adjusted life year.

- Sensitivity analyses

- Reference

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References


