**Abstract**

To evaluate the risk of suboptimal response (SR) to osmotic-release oral system methylphenidate (OROS-MPH) in children, we conducted a retrospective cohort study comparing OROS-MPH to lisdexamfetamine dimesylate (LDX). The study included children and adolescents with attention-deficit/hyperactivity disorder (ADHD) aged 6–17 years, excluding those who had received ADHD treatment in the 6 months before the index date. OROS-MPH and LDX were stratified into high, medium, and low-risk subgroups according to descending predicted risk. In the adjusted LDX SR model, “highest risk” children initiated on LDX experienced significantly lower SR rates (7.1%) compared to OROS-MPH (10.6%). However, SR rates were not significantly different in “medium risk” or “lowest risk” groups.

**Introduction**

Predictive models may help clinicians make better treatment allocation decisions leading to improved patient centered outcomes. However, SR rates were not significantly different in “medium risk” or “lowest risk” groups.

**Objectives**

- To develop suboptimal response prediction (SRP) models for OROS-MPH and LDX using a modified version of logistic regression.
- To evaluate the risk of SR to OROS-MPH and LDX.

**Methods**

- **Study Population**: This retrospective database study compared OROS-MPH and LDX therapies among ADHD patients aged 6–17 years. OROS-MPH is indicated for children and adolescents with ADHD in a clinical setting.
- **Statistical Analysis**: Four suboptimal response prediction (SRP) models were developed: 1) OROS-MPH SRP Model in Children, 2) LDX SRP Model in Children, 3) OROS-MPH SRP Model in Adolescents, and 4) LDX SRP Model in Adolescents. The models were developed using a group LASSO procedure, an extension of the Lasso method, to estimate odds ratios of the differences in observed SR rates of OROS-MPH vs. LDX.

**Results**

- In the adjusted LDX SR model, “highest risk” children initiated on LDX experienced significantly lower SR rates (7.1%) compared to OROS-MPH (10.6%). However, SR rates were not significantly different in “medium risk” or “lowest risk” groups.

**Conclusions**

- The OROS-MPH predictive models illustrated that both children and adolescents with a high predicted risk for SR with OROS-MPH had significantly better treatment outcomes when initiated on LDX compared to OROS-MPH for ADHD.
- The LDX predictive models illustrated that observed SR treatment outcomes were not significantly different among OROS-MPH and LDX patients with a high predicted risk of SR to LDX. In addition, those with the lowest predicted SR risk to LDX experienced significantly lower SR rates with LDX vs. OROS-MPH.
- Sensitivity analyses focusing on SR outcomes of switching and augmentation suggest that differences in SR in the primary analyses may have been driven by differences in discontinuation rates.
- Future studies are warranted to further identify factors contributing to high SR rates, and include these factors in models that may be useful in individualizing treatment options.

**Acknowledgments and Disclosures**

No potential conflicts of interest or relationships to disclose.