Treatment of Attention-Deficit/Hyperactivity Disorder (ADHD): Modeling the Cost-Effectiveness of a Modified-Release Preparation of Methylphenidate from the Perspective of the National Health Service (NHS) in the United Kingdom

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Methylphenidate (MPH) has been shown to be an effective and cost-effective treatment for children and adolescents with attention-deficit/hyperactivity disorder (ADHD). Given their short duration of action, MPH immediate-release (MPH-IR) formulations require multiple daily dosing. Studies have reported noncompliance rates of 20-65%. Objective**:** To evaluate, from the perspective of the UK NHS, the cost-effectiveness of MPH-OROS, a novel once-a-day formulation. Methods**:** A meta-analysis was performed to synthesize data on clinical efficacy from three randomized clinical trials, comparing MPH-OROS o.a.d., MPH-IR t.i.d., and placebo. Results were combined with unit cost data (BNF 2003, PSSRU 2003), resource utilization estimates (NHS perspective), and assumptions on treatment compliance (principal source: systematic review by Claxton et al. 2001). Data were used to populate a decision tree model adapting and extending the CCOHTA analysis (1998) of ADHD therapies. Results**:** MPH-OROS and MPH-IR were significantly more efficacious than placebo, in both community teacher and parent ratings of inattention/overactivity (IOWA Conners I/O scale; primary trial endpoint). For teacher ratings, standardized mean differences (SMD, random effects model) compared to placebo were 1.32 (1.09-1.55, 95% CI, for MPH-OROS) and 1.19 (1.00-1.38 for MPH-IR); effect sizes reported by parents were generally higher and better for MPH-OROS compared to MPH-IR. Assuming 79% compliance with MPH-OROS o.a.d. and 65% with MPH-IR t.i.d. over one year, the incremental cost of MPH-OROS per SMD (teacher ratings) was £1,345 (for MPH-IR: £1,120); for parent ratings, MPH-OROS exhibited extended dominance over MPH-IR. Comprehensive sensitivity analyses were performed. For MPH-IR compliance rates below 57%, MPH-OROS dominated (in an extended sense) also in teacher ratings. Conclusions**:** These data suggest that MPH-OROS will be more effective than MPH-IR t.i.d. in daily practice. They indicate an acceptable incremental cost-effectiveness ratio of MPH-OROS, with extended dominance over MPH-IR under a broad range of assumptions. Real world data will have to confirm these estimates.

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