Single-Dose Pharmacokinetics of Amphetamine Extended-Release Oral Suspension (AMPH EROS) in 6–12-Year-Old Children with ADHD

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Abstract

Methods. This Phase 1, open-label, single-dose, one-period, one-treatment PK study enrolled 12 children 6–12 y with ADHD. PK parameters for d- and l-amphetamine in plasma (Cmax, tmax, AUC0–∞, and t1/2) were calculated and expressed as means, geometric means, and standard deviations. The primary endpoint was all objective PK measurements at 28 hours post-dose. PK was evaluated for 2 cohorts (6 pts ages 6–9 y and 6 pts aged 10–12 y). Safety was monitored continuously and assessed based on occurrence of adverse events.

Results. A single dose of 10 mg (4 ml) AMPH EROS (2.5 mg/ml) administered under fasted conditions resulted in a rapid rise in mean plasma concentration in d-amphetamine, reaching maximum concentrations within 5 hours. The overall study population mean (SD) plasma AUC0–8 (d-amphetamine) was 1061.2 (309) h*ng/mL, and for l-amphetamine was 380.5 (112) h*ng/mL. The mean maximum concentration (Cmax) for the overall study population was 54.91 ng/mL and 17.1 (5.2) ng/mL for d- and l-amphetamine, respectively. The overall study population median time to maximum concentrations (Tmax) for d-amphetamine were reached at 3.4 hours, and for l-amphetamine at 4.1 hours. The elimination half-life (t1/2) for the entire study cohort was 10.6 (2.0) hours for d-amphetamine, and 12.5 (3.2) hours for l-amphetamine. Directionally, a higher mean Cmax, AUC0–∞, and t1/2 were calculated and expressed as means, geometric means, and standard deviations. The primary endpoint was all objective PK measurements at 28 hours post-dose. PK was evaluated for 2 cohorts (6 pts ages 6–9 y and 6 pts aged 10–12 y). Safety was monitored continuously and assessed based on occurrence of adverse events.

Conclusions. This study confirmed that the PK profile of AMPH EROS in 6 to 12-year-olds provided a consistent, predictable extended-release profile in a highly titratable liquid formulation, and this finding was relatively consistent and directionally predictable between the age groups assessed, with higher maximum concentrations and AUCs and shorter elimination half-lives noted in the younger population, with no anomalous parameters demonstrated, and no untoward or unexpected safety issues noted.

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