Combination Strategies for Psychostimulant Drugs Used in ADHD

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Objectives: Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder with an up to 12% prevalence in children worldwide [1]. The most prescribed drugs are psychostimulants, with methylphenidate (MPH) recommended as the front-line prescription. Though extended release (ER) formulations of MPH of different generic forms are widely used, immediate release (IR) are still prescribed in combination to reach therapeutic results while respecting a child’s daily activities. The present study aims to provide a quantitative way to compare the performance of MPH combinations in order to determine the most appropriate drug regimen fitting a patient’s specific needs.

Methods: Using population pharmacokinetic models of different MPH formulations, we generalized a previous computational strategy of dose adaptation to IR MPH [2] to the case of IR and ER combination. Based on the criteria of regimen performance, an in silico comparison was proposed.

Results: Our identified combined regimen outperforms the most widely used clinical regimens. It also allows a better flexibility in terms of a child’s activities.

Conclusions: The developed combination strategy will be included into the existing mobile application that we previously developed.

References:
